Value Creation of
Spin-offs and Carve-outs

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Abstract

This study investigates whether 1074 spin-offs and 803 carve-outs occurring in Europe and the USA between 1990 and 2003 create value. There is a robust positive market revaluation of roughly 1.0% to 3.0% for firms announcing a spin-off or carve-out of a subsidiary. This effect is similar for carve-outs and spin-offs, despite their different natures. Hence, the analysis on the long-term implications of spin-offs and carve-outs consequently unveils substantial differences: While the average spin-off firm outperforms the market, carve-outs considerably underperform. Over time it becomes obvious that spin-offs improve the business itself thanks to the increased independence and the focus on the core business, whereas managers time carve-outs and use them primarily as a cheap mean of funding, one that does not improve the business.

Abstract in German

Diese Studie untersucht, ob 1074 Spin-offs und 803 Carve-outs, die zwischen 1990 und 2003 in Europa und den USA durchgeführt wurden, Wert generierten. Dabei wurde festgestellt, dass sowohl Unternehmungen, welche einen Spin-off, als auch Firmen, welche einen Carve-out einer Tochtergesellschaft bekannt geben, aufgrund dieser Ankündigung am Aktienmarkt zwischen 1,0 % und 3,0 % höher bewertet werden. Damit scheint der Markt diese zwei Transaktionstypen ähnlich einzuschätzen, obwohl sie sich in ihrem Wesen substanziell unterscheiden. Die Analyse der langfristigen Auswirkungen von Spin-offs und Carve-outs zeigt tatsächlich beträchtliche Unterschiede auf. Die durchschnittliche Spin-off-Unternehmung übertrifft die Erwartungen des Aktienmarktes, während Carve-out-Firmen wesentlich schlechter abschneiden. Im Laufe der Zeit wird ersichtlich, dass Spin-offs durch die gesteigerte Unabhängigkeit und die Konzentration auf das Kerngeschäft das eigentliche Geschäft verbessern, während Carve-outs von Managern zu einem günstigen Zeitpunkt primär als günstiges Finanzierungsinstrument verwendet werden und das Geschäft an sich nicht verbessern.

1   Introduction

> *"Smart apple farmers routinely saw off dead and weakened branches to keep their trees healthy. Every year, they also cut back a number of vigorous limbs - those that are blocking light from the rest of the tree or otherwise hampering its growth. And, as the growing season progresses, they pick and discard some perfectly good apples, ensuring that the remaining fruit gets the energy needed to reach its full size and ripeness. Only through such careful, systematic priming does an orchard produce its highest possible yield."*
>
> Dranikoff, Koller and Schneider (2002)

1.1   Motivation

What can managers, investors, academics and the press learn from apple farmers? At first glance, ownership restructurings are, for the press and investors, much less exciting than mergers and acquisitions (M&A). As their empires shrink, managers have few incentives for ownership restructurings and hence companies have a strong bias against it. Additionally, there is little academic research on the benefits of such restructuring. It is thus not surprising that companies often restructure the ownership of their businesses both too little and too late. In my view, companies have many similarities to orchards – like smart apple farmers, managers should focus on prudent, systematic pruning that means following a regular, proactive program of restructuring. The measures of the management should be directed to expand the crop in the coming seasons, thus enabling them to harvest more than the average and exceed the expected crop.

An overview of the different types of ownership restructuring is given in this paper as well as the value creation of spin-offs and carve-outs.[1] Analyzing spin-offs and carve-

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[1] In a spin-off, a parent firm distributes shares of a subsidiary to the parent shareholders; in a carve-out, a portion of shares of a subsidiary is sold through an IPO to new public investors. In order to be able to dif-

outs is particularly interesting, as they are similar, though there are differences: Spin-offs are pure ownership restructurings, undertaken for value purposes only, whereas carve-outs contain besides the ownership restructuring element also a financing element.

1.2   Research Question and Objectives

The overall research question of this paper is:

> *Do companies create value for their shareholders by conducting spin-offs and carve-outs?*

In order to be able to give a thorough answer to this question this paper has three objectives:

1. To present an overview of the strategic, operating, legal, governance, accounting and tax implications of spin-offs and carve-outs in the USA, Germany and Switzerland.

2. To embed spin-offs and carve-outs into the existing principal-agent models and based on this and prior empirical evidence, build hypotheses on the rationales of the value creation of spin-offs and carve-outs.

3. To test the hypotheses by measuring which ownership structure maximizes the value of the business at the announcement and in the long run, and which ownership structure improves the operating performance and the relative valuation of the firm.

1.3   Contribution

A review of the literature shows that as in other areas of finance, most empirical work on this topic as well uses US data, whereas European evidence is scarce. This paper also tests the effects of European transactions. The empirical findings of this paper are based

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ferentiate between "spin-offs" and "carve-outs", an anonymous reader constructed a memory hook: Spin-offs starts with "S", as the parent shareholders get "stocks" of the subsidiary company. In contrast, carve-outs start with "C", as the parent or the subsidiary company gets "cash" due to transaction.

on an extensive data sample of 1,074 spin-offs and 803 carve-outs occurring between 1990 and 2003, a time period that has not yet been broadly investigated in the USA or in Europe. Most of the existing research so far focuses on the announcement effect. This paper measures the value creation of transactions, not only around the announcement, but also analyzes the long-term effects on the stock market, on price multiples and on operating performance of firms involved in spin-offs and carve-outs. For practitioners, the value of this paper is a better understanding of spin-offs and carve-outs, the key differences between them and the various implications in the USA, Germany and Switzerland. This research also intends to unveil the key rationales and drivers for the value creation of spin-offs and carve-outs occurring between 1990 and 2003, thereby enabling practitioners to better assess the stock market and operating consequences of spin-offs and carve-outs.

1.4   Demarcation

This paper aims to give an overview of implications of spin-offs and carve-outs. However, for managers conducting a transaction, the support of experienced, local lawyers, tax consultants and auditors or accountants is indispensable. The empirical measurement of the value creation in this paper is done only for US and European spin-offs and carve-outs, as the data sample on the other types of public ownership restructuring (split-offs and tracking stocks) is too small. It is not the purpose of this paper to be a "cookbook" for successful spin-offs and carve-outs for managers nor is it an investment guide. This paper neither aspires to make a judgment on the efficiency of the stock markets overall, as the long-term stock market effect analysis in this study suffers (as well as any other study on long-term stock market effects) from the joint hypothesis problem.

1.5   Structure

This paper is structured as follows:

- Chapter 2 describes the fundamentals of ownership restructuring transactions. First, the different types of transactions are defined. Subsequently, an overview on the strategic, operational, legal, governance, accounting and tax implications of spin-offs

and carve-outs in the USA, Germany and Switzerland is given. This will provide a better understanding of constraints and implications manager face when planning and conducting spin-offs and carve-outs.

- Chapter 3 presents an overview on models on spin-offs and carve-outs and on the existing research measuring the value creation of that kind of transactions.

- Chapter 4 develops based on the foundation in Chapter 2 and Chapter 3 testable hypotheses. First the two overall hypotheses that (1) spin-offs create more value than carve-outs and that (2) the value creation of spin-offs and carve-outs is similar in Europe or in the USA are derived. The three pillars of rationales for the value creation of spin-offs and carve-outs, "Strategic Business Portfolio Restructuring", "Timing & Financing Needs" and "Outsiders' Information Asymmetry Reduction" are subsequently presented.

- Chapter 5 focuses on empirical tests of the value creation of spin-offs and carve-outs. It first describes the data and the methodology used and then estimates the value creation effects. It empirically tests the announcement effect, the long-term stock market effects, the effects on price multiples and the effects on the operating performance.

- Chapter 6 concludes by summarizing the results, outlining consequences for managers deciding about spin-offs and carve-outs, and giving an outlook.

2   Fundamentals of Spin-offs and Carve-outs

Chapter 2 intends to describe the fundamentals of spin-offs and carve-outs. First the
alternative restructuring transaction types are defined and subsequently strategic, opera-
tional, legal, governance, accounting and tax implications arising from spin-offs and
carve-outs are discussed.

2.1   Type of Restructuring Transactions

An ongoing task of managers is to monitor, improve and hence restructure their busi-
nesses.[2] Rationales for restructurings are manifold: Lehn and Poulsen (1989) see sig-
nificant operating underperformance as rationale while Kaplan (1991) stresses the trig-
gering role of stock market underperformance. Mitchell and Mulherin (1986) put em-
phasis on fundamental economic shocks in the industry and Jensen (1991 and 1993)
argues that the intensifying global competition and changes in technology, input prices,
or regulation are main rationales for restructurings.[3] No matter the rationale for the re-
structuring, once managers have ascertained the need for it they have to decide whether
businesses require fundamental restructuring to address the value creation shortfall or
whether this can be done within the current organizational and management structure.
Most restructuring is done internally without changing the ownership structure for in-
stance by changing the organizational set-up or reorganizing tasks, processes and/or re-
sponsibilities.[4] If outsiders have a more specialized management, higher synergies with

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[2] Rappaport (1992) stresses this, claiming that: "What has happened, is that the pace of innovation and
change in the environment has become so rapid and the magnitudes of the change so great, that CEOs today
are literally spending a large proportion of their time monitoring change and trying to understand what the
next restructuring activity is."

[3] For a good overview on the alternative rationales for restructuring, see Seisreiner and Wurster (2002).

[4] Due to its incremental nature, and, as disclosure rules do not require to inform investors as comprehensively
as in ownership restructuring, organizational restructuring does not receive the detailed external monitoring
given to ownership restructuring (Bowman and Singh, 1990).

other businesses, or funding is cheaper or available quicker for outsiders, firms may decide to facilitate the restructuring by an ownership change.[5] As depicted in Figure 1, this can be done either by private or public transactions.

Figure 1: Alternative Types of Corporate Restructuring

Type of restructuring			Description	Example
				▨ Focus
Restruc-turing options	Organizational restructuring			
		Private trans-actions	• Joint Venture	• Venture capitalist as JV partner for developing business or • Integration to exploit synergies of mature businesses	• Sony – Philips • Nissan – Renault
			• Trade sale	• Sell part or all of business to strategic/financial investor	• Vitamins of Roche • Adams Confectionery of Pfizer
			• LBO/MBO	• Sell to investor or management team who finances significant portion of purchase price	• Vivendi – Universal
	Owner-ship restruc-turing	Public trans-actions	• Carve-out	• Sell portion or all shares of subsidiary through IPO in the equity market	• Siemens – Infineon • Telefonica – Terra • Sulzer – Sulzer Medica (1st step)
			• Spin-off (split-up)	• Parent firm distributes shares of the spun-off subsidiary to parent shareholders	• Novartis – Syngenta • Sulzer – Sulzer Medica (2nd step)
			• Split-off	• Parent company's shareholders are offered shares of a subsidiary in exchange for parents' shares (exchange offer)	• Sara Lee – Coach
			• Tracking stocks	• Separate class of parent stocks distributed to shareholders through a spin-off or sold through a carve-out	• Alcatel – Alcatel Optronics

There are three kinds of private transactions: a joint venture with a partner with specific expertise, selling part of the businesses in a trade sale to an outside buyer, or selling it to investors or the management team in a leveraged buy-out (LBO) or a management buy-

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[5] Another argument for ownership restructuring is that the value creation can possibly be captured immediately for example in a trade sale. However, in all ownership restructuring types, the transaction itself does not "solve" the issues. Hence, subsequently organizational restructuring is required in the new ownership set-up.

out (MBO).[6] If there is a clear best owner identifiable and this best owner is not financially constrained, private transactions are probably preferable to public transactions, as the current parent company can then capture a large portion of the future synergy and improvement potential by a takeover premium.

Public ownership restructuring transactions are carried out via the stock market, thus providing publicly available data about the transaction and therefore enable objective empirical tests on the value creation. A split-off is a mechanism that allows shareholders of a parent company to exchange their shares for shares in a subsidiary that is normally majority-owned by the parent firm. A split-off is defined as the redemption of shares in an existing company in exchange for shares in a newly created one.[7] This method is usually applied as the second step after a carve-out, but has also been used independently to take a private subsidiary public. The split-off of Sara Lee Corporation and Coach Corporation in 2001 is an example of a US split-off. After the transaction, Sara Lee focused on consumer-packaged goods and Coach focused on their production and sales of luxury leather goods.

Tracking stock is a form of common equity that intends to track the performance of a particular line of business within the firm (Billett and Mauer, 2000). Issuing tracking stocks does not create a new legal entity. From a legal point of view, tracking stocks are merely a class of shares with different economic interest such as dividend rights. All other rights and liabilities regarding the parent and the subsidiary company are identical for common and tracking stockholders. Tracking stock is sometimes referred to as "alphabet stock", "letter stock", or "targeted stock". The names "alphabet stock" and "letter stock" arose out of General Motor's acquisitions of Electronic Data Systems and Hughes Aircraft in the 1980s. Lehman Brothers coined the term "targeted stock" when they assisted USX Corporation with their tracking stock equity restructuring in the early 1990s. Tracking stocks can be distributed through a pro-rata distribution of shares to existing parent shareholders through a spin-off, or to new shareholders through a carve-

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[6] For more details on joint ventures, trade sales, LBOs and MBOs, see for example Bowman and Singh (1990).

[7] Split-offs are closely related to spin-offs – the end result of the transaction is that the public stockholders of a parent company own stock in two enterprises, the parent and a split-off subsidiary. The main difference between the two types of transactions is that after the completion of a split-off, the stock of the subsidiary is held by the parent's stockholders on a non-pro rata basis. Some shareholders may hold only parent stock, while others may hold only subsidiary stock, and still others may hold both.

out by an IPO (Chemmanur and Paeglis, 2000; Blanton, Perrett and Taino, 2000).[8] In October 2000, the French company Alcatel was the first and only European firm issuing tracking stocks for its optimal elements business. Today, only five tracking stocks are still running worldwide.[9]

This paper focuses on spin-offs and carve-outs. The popular press often does not differentiate between spin-offs and carve-outs and labels both kinds of transactions as "spin-offs". The findings of this paper make it clear that existing and potential investors should carefully analyze the characteristics and structure of "spin-offs".

2.1.1   Spin-offs

A spin-off is defined as a pro-rata distribution of a majority, (often 80% or more) of shares of the subsidiary to the parent's shareholders.[10] As a result of a 100% spin-off, the subsidiary[11] becomes a totally independent company, with initially the same shareholder base as the parent company. Following the transaction, the former parent shareholders own two securities: The shares from the parent company and the shares from the spun-off subsidiary. Hence a spin-off leaves the portfolio decision (of whether to be shareholder of the parent and the subsidiary company or not) up to the shareholders. Unlike carve-outs, a spin-off does not involve exchange of any cash. Thus, a spin-off is

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[8] See also Billett and Mauer (2000) and Logue, Seward, and Walsh (1996).

[9] The four remaining US tracking stocks consist of University of Phoenix Online (which follows Apollo Group Internet-based education business) Carolina Group (which is tied to the performance of the cigarette unit of Loews), Celera Genomics Group (a biotechnology arm of Applera Corp), and CombiMatrix Group (a division of Acacia Research Corp). The only tracking stock still trading outside the USA is Sony's tracking stock for its Internet-access business.

[10] See Miles and Rosenfeld (1983); Schipper and Smith (1983); Woo, Willard, and Daellenbach (1992); Cusatis, Miles and Woolridge (1993); and Veld and Veld-Merkoulova (2004). If a shareholder in the parent company owns a number of shares, such that he has a fractional entitlement to shares in the subsidiary company, he can either sell such entitlements or buy the required fractional entitlements to achieve entitlement to one share. For details, see Hoechst-Celanese (1999).

[11] As in most of the literature as for instance in Daley, Mehrotra, and Sivakumar (1997), the pre-transaction existing and continuing entity is called the "parent", "parent firm" or the "parent company", and the spun-off or carved-out unit is denoted as the "subsidiary", "subsidiary firm" or the "subsidiary company" (even though there is no parent-subsidiary relation following the transaction anymore).

not motivated by the company's desire to generate immediate cash, while carve-outs (and trade sales) often become a source of liquidity for financially distressed firms.

In this paper, the term "spin-off" is denoted to mean the divestment of mature businesses, not embryonic venture firms (Roberts, 1991) or university spin-off firms (Autio, 1997). A well-known example of a firm resulting from a spin-off is Syngenta AG, resulting from the spin-off and merger of the agrochemical divisions of Novartis and AstraZeneca. Other Swiss examples of spin-offs are Givaudan SA the flavors and fragrances division out of the Roche Holding Ltd or Ciba Specialty Chemicals Holding AG, which was spun-off by Sandoz in 1997.

A split-up is an alternative type of spin-off in which a company separates into several parts, distributes stock of each part to its shareholders, and ceases to exist. The most well known example is the split-up of AT&T Corporation into three companies in 1996. AT&T Corporation was split-up in AT&T Corporation (national telephone network and cellular services), Lucent Technologies Inc. (communications hardware business and Bell Laboratories) and NCR Corp. (computer manufacturing).

2.1.2   Carve-outs

In an equity carve-out, "a portion of a wholly owned subsidiary's common stock is offered for sale to the public" (Schipper and Smith, 1986) or to say it differently, a carve-out is the sale of shares in a non-listed subsidiary to the markets through an initial public offering (IPO). The shares offered that are sold to new shareholders could be either in a secondary carve-out existing shares owned by the parent company, or in a primary carve-out newly-issued shares sold by the subsidiary itself (Schipper and Smith, 1986).[12]

In Switzerland Valora Holding 1997 carved-out Selecta AG, its snacks and refreshments vending machines business. In 1999 the Roche Holding AG carved-out in one of the largest IPO ever, 19% of the Biotechnology firm Genentech. Nestle S.A. announced in 2001 and completed in 2002 the carve-out of 23% of the stocks of its eyecare division Alcon. Sulzer AG carved-out in a first step 1997 Sulzer Medica before the remaining 74% of the stocks were given to the shareholders in 2001 in a spin-off. In Germany well-known examples of carve-outs are the carve-out of Infineon Technologies AG out

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[12] See also Vijh (1999 and 2002).

of Siemens AG and of T-Online International AG out of Deutsche Telekom AG. In most of the cases only a minority stake of the subsidiary is carved-out, as this brings along tax and accounting benefits.[13] However, as in the carve-out of Converium out of Zurich Financial Services in 2001, there exist also 100% carve-outs.

2.2   Strategic Implications

As companies regularly review their portfolios they develop new strategic directions and based on this, decide to carve-out or spin-off subsidiaries.[14] Sections 2.2.1 and 2.2.2 show that spin-offs and carve-outs are embedded into well-known discussions such as diversification (discount), restructuring and refocusing. As there are many barriers for restructuring transactions, Section 2.2.3 has a focus on this topic.

2.2.1   Diversification

The studies of diversification at the corporate level can be grouped into studies of the link between corporate diversification and firm value that means the diversification discount and studies of patterns in corporate diversification over time.[15] From the 1950s to the 1970s, expansive diversification strategies were pursued, resulting in conglomerates that were active in various business areas.[16] These growth strategies based on diversification were mainly influenced by the ideas of Ansoff (1965).[17] The perception of the

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[13] For more details on accounting and tax implications, see Sections 2.6 and 2.7.

[14] See for instance Rechsteiner (1994) and Gaughan (1999).

[15] For a good overview about the literature on the diversification discount, see Martin and Sayrak (2003).

[16] In 1950, only 38.1% of the Fortune 500 US companies generated more the 25% of their revenues from diversified activities. By 1974, this figure had risen to 63%. In 1950, more than 60% of the largest Fortune 500 companies were either single businesses or dominant business firms. By 1974, this had dropped to 37% (Rumelt, 1974).

[17] Ansoff (1965) was the first to show how to apply a formal approach of strategic decision-making. In his growth vector components matrix, diversification is the strategy that intends to sell new products based on a new mission. For an overview about the motives and incentives of diversification, see Hitt, Ireland and Hoskisson (1999). They differentiate between motives to enhance strategic competitiveness (economies of

capital markets later changed; with the result that throughout much of the last decade, the common wisdom among financial economists has been that diversified firms sell at a discount relative to single-segment firms.[18]

Three key explanations for this diversification discount can be found. First, it could be that diversification itself destroys value as the drawbacks of diversification overcompensate the benefits.[19] Benefits of diversification include:

1. Managerial economies of scale as multidivisional firms create a level of management coordinating the specialized divisions (Chandler, 1977).

2. Economies of scope, meaning that firm specific assets could be exploited in other industries (Panzar and Willig, 1981; Teece, 1980; Teece, 1982).

3. Coinsurance effects from combining businesses with imperfectly correlated earnings. As a result conglomerates have a greater debt capacity due to this portfolio effect (Lewellen, 1971; Hennessy, 2000).

4. Alleviating adverse selection problems when issuing equity (Hadlock, Ryngaert and Thomas, 2001)

Possible disadvantages of diversified firms are:

1. The opportunities for managers of firms with free cash flow to inefficiently use the excess cash for empire building (Jensen, 1986; Matsusaka and Nanda, 2002).

2. Limited know-how and experience of conglomerates' managers active in various businesses (Cornell, 1998).

3. Information asymmetries between managers and outside market participants such as analysts as managers have information not available to market participants (Krishnaswami and Subramaniam, 1999). In addition, outside market participants show a

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scope, market power and financial economics), incentives and resources (e.g., antitrust regulation, tax laws, and low performance) and managerial motives (diversifying managerial employment risk and increasing managerial compensation).

[18] Berger and Ofek (1995) find based on sample from 1986 to 1991 that the sum of the stand-alone values to the firm's actual value implies on average a 13% to 15% value loss from diversification. See also Wernerfelt and Montgomery (1988); Lang and Stulz (1994); Servaes (1996); and Maksimovic and Phillips (2002).

[19] For a more detailed description of pros and cons of diversification, see Campa and Kedia (2002).

lack of understanding for diversified firms; as for example equity analysts are specialized in one industry (Gilson et al., 2001).

4. Information asymmetries between central management and divisional managers add complexity and lead to high costs of coordination (Harris, Kriebel and Raviv, 1982). They also make it difficult to motivate divisional managers by giving them equity participation in the diversified firm (Aron, 1991).

One of the key questions regarding the benefits and drawbacks of diversification is whether internal or external capital markets are more efficient in allocating resources to businesses with good investment opportunities.[20] Scharfstein and Stein (2000) ascribe the diversification discount to agency problems that are exacerbated within the multidivisional structure. They show that in diversified firms, divisional managers have an increased incentive for rent seeking and subsequently subvert the internal capital allocation decisions. Gertner, Powers, and Scharfstein (2000) examine the investment behavior of subsidiary firms before and after they are spun-off. They show that investments after the spin-off are significantly more sensitive to measures of investment opportunities (such as the industry's Tobin's Q[21]) than before the transaction. Their findings suggest that spin-offs improve the allocation of capital.

The second explanation for the diversification discount is that the lower value of diversified firms is not causally related, but merely reflects a selection bias. Firms that choose

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[20] Stein (1997) makes the case that internal capital markets are more efficient than external markets, as corporate headquarters are likely to be better informed than external suppliers of capital about investment opportunities within the firm. Stulz (1990) argues that larger internal capital markets help diversified firms reduce the underinvestment problem described by Myers (1977). Matsusaka and Nanda (2002) stress that diversified firms are more valuable as their real option to avoid costly external capital markets is valid in more states of the world than the one of single segment firms. On the contrary, several studies suggest that conglomerates tend to misallocate their investment funds by cross subsidizing poorly performing divisions (Shin and Stulz, 1998; and Lamont, 1997). Berger and Ofek (1995), for example, find that diversified firms tend to invest too much in segments with poor investment opportunities and that this kind of overinvestment is associated with lower firm value. Rajan, Servaes, and Zingales (2000) model the presence of power struggles among the firm's divisions and show that diversification causes resources to be used for inefficient investments.

[21] Tobin's Q is the present value of future cash flows divided by the replacement cost of tangible assets, see e.g., Lang and Stulz (1994).

to diversify differ from not diversifying firms in a number of characteristics.[22] If less valuable firms tend to cluster together into conglomerates, then the fact that the average conglomerate is worth less than a comparable portfolio of single segment firms does not necessarily imply value destruction, as diversified firms were already trading at a discount prior to diversifying (Chevalier, 1999; Lang and Stulz, 1994; Servaes, 1996).

A third explanation for the diversification discount are measurement errors such as errors in measuring Tobin's Q (Whited, 2001). Burch and Nanda (2003) and Lamont and Polk (2002) test the three possible explanations for the diversification discount and conclude that the diversification discounts at least partially reflect a value loss due to the diversified nature of the firm itself, rather than only due to the selection bias or measurement errors.

2.2.2   Restructuring and Refocusing

Although the debate whether there is a diversification discount or not goes on, it is obvious that it is demanding to manage a conglomerate due to its complexities, inefficiencies and administrative burdens. Even today, many multi-business groups own assets, which are under-exploited, strategically constrained or for which they are not the best owner. [23] Moreover, multi-business groups often face focused competitors with diverging business models, each of which requires different skills and success factors, as they are at different stages of the lifetime cycle.[24] This situation, often combined with a performance or a growth issue, triggers a systematic review of company portfolios. Hill and Jones (1998) differentiate between two approaches to review a company's existing portfolio of busi-

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[22] See Campa and Kedia (2002); Villalonga (1999); and Graham, Lemmon, and Wolf (2002). Villalonga (2004) even finds based on an alternative data sample a diversification premium.

[23] Caytas and Mahari (1988) compare restructurings with the history of Koh-i-Noor (mountain of light), the largest diamond ever found (793 carats). They stress that before the recut, the Koh-i-Noor was just a huge impressive stone. Only thanks to the recutting, reducing the Koh-i-Noor to 109 carats, the gem got so brilliant and attractive and became hence the center stone of the crown of Queen Mary.

[24] See Achleitner and Wahl (2003) for more details on divestitures of businesses that are at the end of their lifetime cycle.

ness activities: It can either be done with portfolio planning matrices[25] or by reviewing the company's core competencies (Hamel and Prahalad, 1990). A more focused strategy is often the result of these corporate portfolio-reviewing processes.[26] Activities and business lines that do not belong to the core business and hence do not have the required strategic fit get prepared for divestment (Kaplan and Weisbach, 1992). A frequent finding is that refocusing raises firm value (Berger and Ofek, 1999).[27] Public ownership restructuring transactions such as carve-outs and spin-offs can be used to speed up and implement the intended focus (Schipper and Smith, 1983). Hence, that kind of transaction has gone from being a technique to eliminate poor performers and has become a mean of unlocking value (Cornell, 1998).

The interdependencies between diversifying M&As and focus improving divestitures have been the topic of many papers. One broadly supported explanation is that firms that had previously diversified with M&As conduct spin-offs and carve-outs.[28] This might be after acquisitions, where from the beginning, the acquirer was exclusively interested in a specific part of the target's businesses; hence they spin-off the other part. It might also be that the expected synergies do not materialize and the acquirer corrects a

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[25] Initially often proposed by management consultants. For example, Boston Consulting Group's four cells matrix based on relative market share and industry growth rate resulting in cash cows, dogs, questions marks and stars or McKinsey's nine cells matrix based on competitive position and industry attractiveness.

[26] In the 1960s and 1970s, this was primarily an answer to the disappointing performance of the former diversification strategies. Other reasons for the increased restructuring activities include according to Hill and Jones (1998) (1) innovations in management processes that have diminished the advantages of diversification, (2) new ways to cooperate, such as strategic outsourcing, strategic alliances or virtual corporations, (3) shorter product life cycles that privileged smaller, more dynamic and innovative companies and (4) many diversified companies found their core business areas under attack from new competitors and therefore management wanted to devote more time and attention to the challenged core business.

[27] Berger and Ofek (1999) come to the conclusion that firms with the greatest value loss due to diversification are the most likely to have divestitures. See also Comment and Jarrell (1995), Markides (1995), and John and Ofek (1995).

[28] Porter (1987) finds that more than 50% of the acquisitions made by 33 firms in unrelated industries were subsequently divested. Ravenscraft and Scherer (1987) report that 33% of acquisitions in the 1960s and 1970s were later divested and Kaplan and Weisbach (1992), who study a sample of large acquisitions completed between 1971 and 1982, notice that by the end of 1989, the acquirers have divested almost 44% of the target companies.

former mistake or that the parent company realizes that it does not want to provide the funds required for investments.[29]

There is also another perspective on the interdependence between M&As and divestitures: Dranikoff, Koller, and Schneider (2002) document that companies actively managing their business portfolios through both acquisitions and divestitures create substantially more shareholder value than companies passively sticking to their existing businesses. Corporations that balance divestitures and acquisitions perform better than companies focusing on one or the other. In their view, regularly divesting businesses with missing strategic fit, no matter how good they are, ensures that the remaining units reach their potential and that the overall company grows stronger. They also argue that executives spend too much time on acquiring businesses and not dedicating adequate attention to divesting them.[30]

2.2.3 Barriers for Restructuring Transactions

One can differentiate between voluntary and mandatory public ownership restructuring transactions, whereas voluntary are much more frequent than mandatory transactions (Achleitner and Wahl, 2003). Barriers for restructuring transactions are only relevant to voluntary transactions.[31] In mandatory transactions, the firm is obliged to act due to legal or regulatory reasons such as anti-trust laws (Kudla and McInish, 1983). Quasi-mandatory transactions are those where management intends to free up a parent or a subsidiary from the other's regulatory or legal burden (McKenna, 2000). For example if a subsidiary faces significant legal problems, a divestiture may remove the legal uncertainties from the parent firm. Additionally, a business or subsidiary may also be divested to

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[29] See for instance Allen et al. (1995).

[30] This might be one of the reasons why acquisitions are more common than divestitures. Fluck and Lynch (1999) find another explanation: According to their model, the motivation for mergers stems from the inability to finance marginally profitable projects as standalone firm due to agency problems. Hence a conglomerate merger is a way that allows these projects to survive a period of distress. However, if profitability improves, the financing synergy ends and the acquirer divests these assets.

[31] For more details on barriers for restructuring transactions, see Rechsteiner (1994).

prevent the threat of anti-trust accusations.[32] Krishnaswami and Subramaniam (1999) investigate on the impact of the regulatory status of spin-offs on the announcement effect and find no significant influence. Schipper and Smith (1983) on the other hand show that the announcement effect is slightly bigger for spin-offs associated with regulatory or tax advantages. They conclude that relaxing regulatory or tax constraints can hence be a source of shareholder gains in spin-offs.

More than 75% of divestitures are reactive and often extrinsically motivated (Achleitner and Wahl, 2003; Dranikoff, Koller, and Schneider, 2002). This may be a result from the fact that many firms have a strong bias against divestitures. They divest businesses only reactive to: (1) pressure from the capital markets (Berger and Ofek, 1999) especially takeover threats, negative analysts reports, pressure from blockholders (Bethel and Liebeskind, 1993), or poor stock market performance (Jain, 1985); (2) poor operating performance such as heavy losses; or (3) a parent company's large debt burden (Berger and Ofek, 1999). Boards may also try to circumvent divestitures and keep on holding businesses long after the divestiture is appropriate, in an attempt to avoid creating an image of failure or weakness (Caytas and Mahari, 1988). Therefore it is not surprising that Dranikoff, Koller, and Schneider (2002), Ravenscraft and Scherer (1991), and Markides (1992) show that a recent change in management increases the probability of divestitures. Divestitures are also much more probable after takeovers than without corporate control changes (Bhide, 1989; Bhagat, Shleifer, Vishny, 1990). New management often has fewer barriers to undo previously done acquisitions. This is consistent with the arguments of Boot (1992) and Cho and Cohen (1997), showing that the new managers can unveil the mistakes of their predecessors. An additional factor against divestitures such as spin-offs is that they reduce the managers' empires. The result of these different kinds of barriers against divestitures is that companies often sell businesses too late and hence at too low prices.[33]

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[32] The spin-off of Liberty Media out of AT&T is such an example. AT&T wanted to overcome potential regulatory issues and conflict of interests resulting from owning cable networks and television channels (NZZ, 2001).

[33] There are additional elements of cost in holding on too long to a unit. Companies with subsidiaries that produce regular but not growing revenues can become complacent, hence ignoring the corporate need to build new, higher-growth units. This supports risk-averse corporate cultures, which stifles innovation and diverts management time and capital to slow-growing businesses (Dranikoff, Koller, and Schneider, 2002).

2.3   Operational Implications

Spin-offs and carve-outs differ substantially in terms of their operational implications. Spun-off subsidiaries are fully independent of their parents and hence have clear goals and decision processes. As an independent company, they lose potential synergies with the parent company. However, as parents and subsidiary firms often are active in disparate lines of businesses with different business environments, the synergy potential is limited and parents and subsidiaries' managers face different operational and strategic challenges (Kudla and McInish, 1983). Thus the benefits of independence often outweigh the disadvantages: Both firms involved in spin-offs can focus on their business and no longer have to concern themselves with the others' business. As there are no conflicts of interest with the parent, spun-off subsidiaries can approach competitors of their former parent as customers, suppliers or partners more easily. They also benefit from full operational and strategic freedom. On the one hand, spin-off subsidiaries lose access to the internal capital market of their former parent firm. On the other hand, they can use external financing opportunities that are tailored to their needs. Additionally, their listed stock is an attractive currency for acquisitive growth.

The day-to-day business of carve-out subsidiaries, in contrast, is still heavily influenced by the strong, existing link to the parent firm. The fact that carve-outs enable employee stock option plans that improve management incentives and that the synergies with the parent company can be exploited further, are two advantages of this transaction type. However, there are many disadvantages of carve-outs if only a minority stake is carved-out. The major weakness of carve-outs is the potential for operating conflicts between the two companies. The problem is created because the managers of the carved-out subsidiary firm have a new group of financial stakeholders who have different goals, requirements and interests than the original stakeholder (McKenna, 2000). This conflict can lead to sub-optimal decision-making and may hinder the performance of either firm. Additionally, the parent company still owning the majority of shares in the subsidiary cannot fully focus on its own business, as they are still concerned about the operational performance and strategic moves of the subsidiary. Subsidiary's management has to fulfill the expectations of their strongest shareholder and therefore has not the full freedom to act. Potential customers, suppliers and partners are aware of this and hesitate to set-up long-term contracts with the carved-out subsidiary. Thus, carve-outs bring along conflicts of interest, limited strategic flexibility, an unattractive acquisition currency and limited access to suppliers and customers. As a consequence, the lack of separation be-

tween the two entities prevents the subsidiary as well as the parent firm from fully reaching its potential.

2.4   Legal Implications

The process of a spin-off or a carve-out starts with organizational restructuring that means preparing the internal separation such as business processes, reporting lines etc. (Blanton, Perrett and Taino, 2000). The process depends on the pre-transaction structure of the parent firm; whether there is a group structure with separate legal entities, or whether there is only one legal entity organized according to Strategic Business Units (SBUs).

2.4.1   Spin-offs

Figure 2 gives an overview of the situation before and after a spin-off. If the parent firm is organized in a group structure before the transaction, the spin-off consists mainly of the distribution of shares in the spun-off subsidiary to its own shareholders and the concurrent listing of the subsidiary shares on a stock exchange. If the parent firm has a SBU structure before the transaction, the parent firms can create a legal entity for its subsidiary and distribute the shares of this subsidiary to its own shareholders in Germany and Switzerland in one step. In the USA in contrast, parent firms first have to create a separate legal entity for the subsidiary, before the shares of this subsidiary can be distributed to the parent company shareholders.

Figure 2: Spin-off Formation

Pre spin-off

Group structure

Existing parent shareholders

Parent company

Other businesses | Subsidiary

The parent distributes its shares in the spun-off subsidiary to its own shareholders

Strategic Business Unit structure

Existing parent shareholders

Manage-ment

Other businesses | Subsidiary

The parent creates in one step a legal entity for its subsidiary and distributes the **shares of this subsidiary to its own shareholders** *(not possible in the USA)*

Shareholders
Legal entity
SBU/Management

Post spin-off

Existing parent shareholders hold 2 securities

Parent company

Other businesses | Independent Subsidiary

The parent shareholders own two securities:
- shares from the parent company
- shares from the spun-off subsidiary

2.4.1.1   USA

Suchan (2004) points out that spin-offs are a two-step process in the USA, if the subsidiary is not a separate legal entity yet. In the first step, the parent company founds a new company and transfers the subsidiary's business to this new legal entity in exchange for all of the new entity's outstanding stock. The corporate law requirements for this transfer are identical with those for any formation of a corporation. The second step of a spin-off in the USA is the distribution of the subsidiary shares to the parent shareholders through a pro-rata dividend so that the parent shareholders own two securities - the

shares of the parent company as well as the shares of the subsidiary company (Blanton, Perrett and Taino, 2000). To this dividend the same corporate law limitations as to any other dividend apply (Suchan, 2004).

According to Glover (2002) and the Bulletin No. 4 of the SEC, a subsidiary company does not need to register the shares of the spin-off with the SEC if it meets the following conditions of the Securities Act of 1933: (1) The parent shareholders do not provide consideration for the spun-off shares; (2) the spin-off is pro-rata to the parent shareholders; (3) the parent company provides adequate information about the parent and the subsidiary company to its shareholders and to the stock markets; (4) the parent has a valid business purpose for the spin-off; and (5) the spun-off shares are not restricted securities. If the parent spins-off restricted securities, it must have held those securities for at least two years, unless it formed the subsidiary being spun-off. When the parent is a public company, though, the subsidiary's securities must be registered under the Securities Exchange Act of 1934. The parent must distribute an information statement describing the spun-off company and the transaction to its stockholders and must also include pro-forma financials.[34] Moreover, the parent company has to provide an audited financial statement of the subsidiary company on a standalone basis. The subsidiary company itself has to file a form 10 with the SEC. This includes a description of the risk factors, capitalization table, business description, management section and selected financials.

At the same time as the spin-off takes place, the subsidiary company's stocks usually will become listed at a stock exchange in order to ensure a liquid and efficient secondary market. The parent company and the subsidiary company may also choose to trade on different exchanges. Under the Securities Act of 1933, the subsidiary company must disclose, as in any public offering of securities, a registration statement on form S-1[35] to

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[34] The parent company has to hand in a form 8-K. 8-K is a report of unscheduled material events or corporate changes which could be of importance to the shareholders or to the SEC. Examples include acquisition, bankruptcy, resignation of directors, or a change in the fiscal year.

[35] Companies often file S-1's with the SEC long before they make printed prospectuses (i.e., the final prospectus, form 424B filing) available to the public. That means S-1 is the pre-effective registration statement submitted when a company decides to go public. S-1 generally consists of the following sections: front section, cover/inside cover, prospectus summary, risk factors, use of proceeds, dividend policy, capitalization, dilution, selected financial data, management's discussion and analysis, business, management, certain transactions, principal shareholders and description of capital stock, underwriting, legal matters/experts/additional information, financial statements and other documents.

the SEC. A company making a public offering is exempted from filing an S-1 form only if it has been filing annual (10-K) and quarterly (10-Q) reports with the SEC for at least three years and meets additional criteria.

As stated in Glover (2002), spin-off parent and subsidiary firms often enter into a spin-off agreement defining the spin-off dividend. This agreement may also assign the assets to the company to be spun-off and liabilities between the parent and the subsidiary. Assets and liabilities have to be assigned in a way that ensures that both firms involved have all the assets they need to carry on their businesses and that they will bear primary responsibility for the liabilities associated with their businesses. The agreement may also include arrangements under which the parent or the subsidiary makes payments or provides guarantees and indemnities to the other company. The parent and the subsidiary to be spun-off may also enter into supply, distribution and marketing arrangements and technology licensing agreements. In addition, they may enter into agreements under which the parent will continue to provide the subsidiary with administrative services—such as accounting, legal and other similar services—for a specified period following the completion of the transaction. The parent and the subsidiary to be spun-off may enter into tax sharing agreements. Finally, they may enter into covenants not to compete under which the parent and spun-off company set forth the limits on their freedom to compete.

2.4.1.2   Germany

There are two different approaches to conduct a spin-off in Germany. Prior to January 1st 1995, the only possibility to conduct a spin-off was the spin-off with transfer of a singular title (*"Spaltung mit Einzelrechtsübertragung[36]")*. That means a two-step approach, by first transferring assets into an existing or new wholly owned subsidiary and then distributing the stock of this subsidiary to the parent company's shareholders.[37] The German Corporate Reorganization Act (*"Umwandlungsgesetz"*), which will be the

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[36] To ensure a consistent understanding of legal terms, the respective German term is given in brackets. This is especially important, as there are no German terms for spin-offs, split-offs and carve-outs as defined in this paper.

[37] Suchan (2004) stresses that the tax treatment will be different, although the economic effect of the two-step approach is the same as in a *"Abspaltung"* as the shareholders of the parent company in the end own stock of the parent as well as of the subsidiary company.

focus of this section, provides a second new method. The German Corporate Reorganization Act's goal is to reduce formalities when a legal structure is changed. Hence, UmwG permits the process of reorganization to take place by way of universal succession ("*Gesamtrechtsnachfolge*"). The Corporate Reorganization Act offers three possibilities: *"Aufspaltung"*, *"Abspaltung"* or *"Ausgliederung"*. An *"Aufspaltung",* according to section 123 (1) UmwG, refers to a split-up, where the initial company ceases to exist. An *"Ausgliederung"* is the transfer of part of the assets of the entity to a new or existing other corporation in exchange for stock in this corporation. An *"Abspaltung",* according to section 123 (2) UmwG, is equivalent in economic terminology to a spin-off or split-off. The Corporate Reorganization Act differentiates between symmetric and asymmetric distribution of rights to parent company shareholders. Symmetrically (as in spin-offs) means that shareholders of the parent firm receive shares in the subsidiary firm proportional to their previous participation, while in an asymmetrical allocation (as in split-offs), the rights are not distributed proportionally to the participation in the parent company before the transaction.

Achleitner and Wahl (2003) show that transactions according to the Corporate Reorganization Act consist of three key steps:

1. Preparatory phase

   - Spin-off plan and spin-off contract (sections 4, 6 and 7 UmwG)

   - Spin-off report

   - Spin-off audit (sections 9 to 12 UmwG)

2. Decision phase

   - Spin-off decision (sections 13 to 15 UmwG)

   - Special rules

3. Execution phase

   - Application for registration of the spin-off (sections 16, 17 and 19 UmwG)

   - Registration of the spin-off (sections 21 UmwG)

   - Disclosure of the spin-off (sections 22, 23, 25 and 26 UmwG)

Once the transaction becomes effective, the parent company no longer has legal liability, as the rights, duties, assets and liabilities are transferred to the subsidiary company together with the subsidiary company's equity. However, the parent company remains

jointly liable with the subsidiary company for the first five years for any transferred liability. According to Achleitner and Wahl (2003), a capital reduction is usually required when equity is transferred to the subsidiary company. This can be done in a simplified manner, as detailed in section 145 (1) UmwG. One can conclude that the Corporate Reorganization Act enables spin-offs in Germany to be conducted in a simplified manner. The spin-off of Takkt AG out of Gehe AG and Celanese AG out of Hoechst AG (the first spin-offs according to the new law) gave objective evidence for this assumption.[38]

In terms of disclosure, it is required to register the spin-off in the Commercial Registers of the parent as well as the subsidiary company (sections 130, 125 and 20 UmwG). A mandatory report on the transaction must detail legal and commercial information and justification of the transaction (sections 4, 6, 7 and 127 UmwG). Also required is an external auditor who prepares a report (sections 9 to 12 UmwG). As in other countries, the subsidiary company's stocks generally will be listed at a stock exchange. The listing requirements are the same as for any IPO and are specific to the selected stock exchange. Three key documents defining conditions for a listing at a German stock exchange are the Prospectus Ordinance, the Stock Exchange Admission Regulation and the Exchange Act.[39] The listing regulations of exchanges all over Europe (including Switzerland) are heavily dependent on the relevant directives of the European Union of which the Admission Directive, the Prospectus Directive and the Interim Reports Directive.[40]

2.4.1.3   Switzerland

Since the end of the 1990s, there were several spin-off transactions in Switzerland for instance Sandoz spun-off Ciba SC, Novartis spun-off Syngenta, Algroup spun-off Lonza

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[38] For more details, see Mehring-Schlegel and Zimmermann (2001).

[39] Fore details on the requirements of the listing prospectus, see Wiesmann, von Gossler, and von Harder (2001).

[40] Directive 79/279/EEC coordinates the conditions for the admission of securities to official stock exchange listing; Directive 80/390/EEC coordinates the requirements for the drawing up, scrutiny and distribution of the listing particulars to be published for the admission of securities; and Directive 82/121/EEC lists information to be published on a regular basis by companies whose shares are admitted to official stock exchange listing.

and Roche spun-off Givaudan. The legal situation at that time was ambiguous. The commentary on the Swiss Merger Act (BEFusG 2000) states that spin-offs were not foreseen in Swiss legislation and were therefore illegitimate. As of July 1, 2004, the formation of spin-offs, split-ups, split-offs and the first step of carve-outs were regulated in the Swiss Merger Act (*"Fusionsgesetz"*).

The Merger Act differentiates between *"Abspaltung"* and *"Aufspaltung"*.[41] According to section 29b FusG, an "*Abspaltung*" is when the parent company transfers part of its assets and liabilities to other companies (Riedweg, 1998). The shareholders of the parent company then receive shares of the corresponding subsidiary company. Since not all assets and liabilities are disposed of, the parent company continues to exist and is left with some of its original assets and liabilities. This characterization corresponds to the definition of a spin-off or a split-off given in Section 2.1.1. According to section 29a FusG, an "*Aufspaltung*" (which is, according to the definition given in section 2.1.1 a split-up) is when the parent company divides all of its assets and liabilities into two or more parts. They may transfer these to other companies in which the shareholders of the parent company then receive a corresponding share (Reich, 2000). At this stage, the parent company is dissolved and deleted from the Commercial Register.

The regulation of these two types in the Swiss Merger Act is very similar. This paper focuses on the more relevant area of „*Abspaltung*", as there are many more spin-offs and split-offs than split-ups.[42] As in the German Corporate Reorganization Act, the Swiss Merger Act also differentiates between symmetric (i.e., spin-offs) and asymmetric (i.e., split-offs) allocation of participation and voting rights to parent company shareholders (section 31 (2) lit. a and b FusG; ESTV, 2004).

According to Von der Crone et. al (2004a), the procedure of a spin-off or split-off requires the following documents and decrees:[43]

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[41] According to the Swiss American Chamber of Commerce (2003), an *"Abspaltung"* as well as an *"Aufspaltung"* must always be vertical, meaning that the business will be divided vertically. The horizontal "demerger" (where the business to be divided will be contributed to a subsidiary) must be realized by the way of transfer of assets and liabilities (See Section 2.4.2.3 on Swiss carve-outs).

[42] Consequently, in this section the term spin-off also meant to include split-offs and split-ups.

[43] The Merger Act provides the possibility of a simplified process for small and medium-sized enterprises: They may opt to neither prepare a demerger report, appoint an auditor nor grant a right of document inspection. This dispensation, however, is conditional on the approval of all members (section 39 (2), section 40 based on section 15 (2) and section 41 (2) FusG.)

- The executive bodies of the involved companies shall establish in writing a spin-off contract (section 36 (1) FusG).

- A spin-off plan has to be prepared by the executive bodies of the involved companies if the parent company intends to transfer parts of its assets and liabilities to companies that will be newly established (section 36 (2) FusG).

- The assets and liabilities to be transferred with the spin-offs shall be listed in an inventory and the employment contracts shall be specified (section 37 lit b FusG).

- In either a commonly or separately edited and written spin-off report, the executive bodies of the involved companies shall explain and clearly state the reasons for the planned transaction (section 39 FusG).

- A qualified auditor must examine the balance sheet, the spin-off agreement and the spin-off report. These documents, together with the corresponding final reports, shall be subsequently disclosed (section 40 FusG).

- Upon consent of the general meeting and its required quorum, the spin-off takes effect with the entry into the Commercial Register and all assets and liabilities are transferred to the subsidiary company (*"partielle Universalsukzession"* Sections 43, 51 and 52 FusG).

Watter and Reutter (2002) show that there are different possibilities to transfer shares of the subsidiary company from the parent company to the its shareholders in Switzerland:

- Through a capital increase of the subsidiary company and a transfer of the rights issue from the parent company to its shareholders (as it was done in the spin-offs of Ciba SC and Lonza).

- Through the issue of new subsidiary company shares (Givaudan).

- Through the issue of new subsidiary company shares linked with a capital reduction of the parent company (Sulzer Medica).

- Through the issue of rights issues to the parent company shareholders, enabling them to buy subsidiary company shares at nominal value from the parent company (Syngenta).

As the transaction takes place, the subsidiary company's stocks simultaneously will be listed at a stock exchange, accomplishing the normal legal requirements of a listing.[44] The respective regulation in Switzerland, such as the duty to publish a prospectus and the prospectus liability, is covered in the sections 652a, 1156 and 752 of the Swiss Code of Obligations (CO) and the section 32 of the Listing Rules of the SWX Swiss Stock Exchange (SWX).[45] A stock exchange listing involves a number of far-reaching obligations for issuers.[46] Spin-off subsidiary companies usually qualify as an exception to the listing requirement that an issuer must have been in existence for three years (section 7 LR and Directive on Exemptions from the "Three-Year Rule" of the SWX). Another issue, which is more severe for spin-offs than for other IPOs, is the flow-back pressure.[47]

2.4.2   Carve-outs

Elsas and Löffler (2001) document that carve-outs, in comparison to trade sales and spin-offs, are a specific type of asset sales with distinguishing features. New shareholders are public ones and dispersed as opposed to a single buyer in a trade sale. In addition, carve-outs always generate cash, either for the parent or the subsidiary company. While a trade sale also raises funds, this does not hold true for spin-offs. An important legal difference between carve-outs, as compared to trade sales and spin-offs, is the required constitution of a separate legal entity before the transaction, even if the parent firm has a SBU structure (Figure 3).

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[44] Hodel (2002) gives a good overview of legal implications arising from a listing at the SWX.

[45] For more details on the prospectus and the prospectus liability, see Lenoir (2004).

[46] Foremost among these are transparency requirements (such as disclosure requirements), the obligation to present a true and fair view of the financials, the obligation to provide information on technical and administrative matters, corporate governance requirements and the regulations concerning disclosure of price-sensitive facts.

[47] Watter and Reutter (2002) discuss the legal implications of the measures e.g., share repurchasing programs against the potential flow-back pressure.

Figure 3: Carve-out Formation
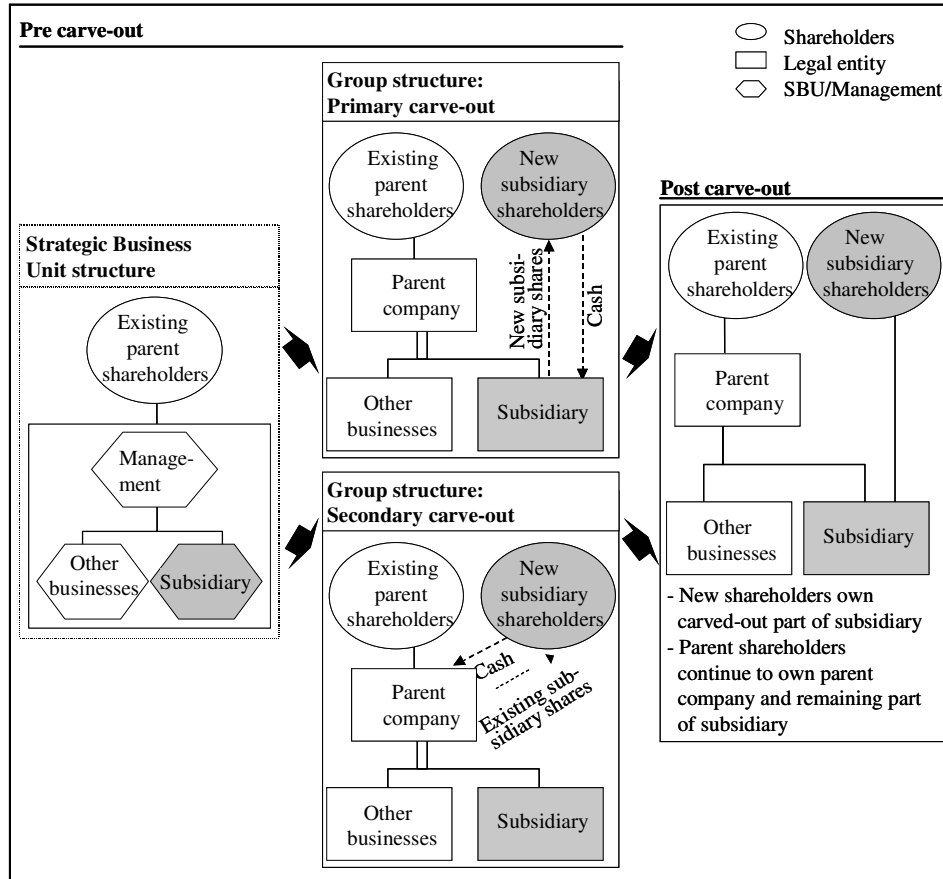
As pointed out by Allen and McConnell (1998), although the parent often still holds significant stakes in the subsidiary after the IPO, management of the parent company has lost significant control rights. The subsidiary has its own management, is subject to disclosure requirements and underlies the mechanisms of the market for corporate control.

According to Rossetto, Perotti, and Kranenburg (2002), carve-outs seem to be especially transitory and part of a dynamic strategy. Within two to six years after the transaction,

most of the carved-out subsidiary firms have ceased to exist.[48] Carve-outs can hence be
seen as a real options; either as a "call option to reacquire" or a "put option to sell or
spin-off" (Rossetto, Perotti, and Kranenburg, 2002). The "dynamic strategies" of Euro-
pean incumbent telecommunication companies regarding their Internet Service Providers
divisions are good examples showing the optionality of carve-outs: Deutsche Telekom,
France Télécom and Telefónica first issued the options by carving-out minority stakes in
their T-Online, Wanadoo and Terra Lycos divisions during the tech boom in the end of
the 1990s, when these businesses were very aggressively valued. After the subsequent
decline in stock market prices particularly in these businesses, they are exercising their
call options by reintegrating these divisions (i.e., buying back the shares) in 2003 and
2004 for much lower prices.

2.4.2.1   USA

In carve-outs, the particular line of business is first consolidated into one subsidiary by
transferring the assets and liabilities related to this line of business to a separate, eventu-
ally newly-founded legal entity. Parts of the shares of the subsidiary company are then
sold to public investors in an IPO.

Primary Carve-out vs. Secondary Carve-out

As depicted in Figure 3, in a primary carve-out, the subsidiary sells newly issued sub-
sidiary company stocks to outside investors via an IPO. The parent is not a direct party
of the offering, although its fractional ownership in the subsidiary company decreases.
The proceeds of the IPO go to the subsidiary, and can be used (1) to pay off loans espe-
cially those owed to the parent, (2) to retire debt incurred to finance a special cash divi-
dend previously paid to the parent or (3) to finance its own development.

In a secondary-share offering, the parent company sells shares in the subsidiary in an
IPO to new shareholders. Hence the proceeds of the IPO go to the parent firm (Blanton,
Perrett and Taino, 2000). However, in many cases a combination occurs, that means the

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[48] Schipper and Smith (1986) find that more than 60% of the carved-out subsidiaries were later reacquired by
the parent, completely divested, spun-off, or liquidated. Klein, Rosenfeld, and Beranek (1991) show that
56% of all carve-outs are reacquired and 38% are sold. Hand and Skantz (1999b) document that 42,7% of
the carved-out subsidiaries are sold, 17.4% are reacquired, and 13.2% are spun-off.

parent sells part of its holdings and the subsidiary raises new equity. After the carve-out, the parent shareholders continue to own their share in the parent company and indirectly a reduced part of the subsidiary. Such a partial carve-out may allow the parent company to keep the benefits of tax pooling and could be used as a first step towards a tax-free spin-off or split-off.

Carve-out followed by a spin-off

As described in Low (2002) and Blanton, Perrett and Taino (2000), there has been a noticeable trend in the USA towards two-step spin-off transactions. Parent firms first sell up to 20% of the shares in the subsidiary in a carve-out and after a seasoning period, the parent company distributes the remaining ownership stake in the subsidiary company (pro-rata in a spin-off to parent company shareholders).[49] A recent example of such a two-step spin-off is the carve-out by Motorola in mid of 2004 of less than 10% of its semiconductor unit Freescale and the subsequent spin-off of the remaining stake in December 2004. After the spin-off, Motorola will no longer own any shares of Freescale Semiconductor and Freescale will be a fully independent, publicly traded company. The 20% limit is usually observed in the first step in order to preserve the tax-free status of the transaction (according to section 355 IRC).[50] The advantage of this two-step spin-off is that using the carve-out as the first step enables dedicated equity analyst coverage of the subsidiary company before the full spin-off. Additionally, market making supports the subsidiary company shares and this procedure limits the flow-back pressure by creating a natural investor base.[51] On the contrary, a one-step spin-off is a more simple transaction for the parent company that guarantees a quick execution and is less dependent on the capital markets environment, as the parent company does not cash-out on any

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[49] Split-offs can also be used as back-end transactions for the second step. Blanton, Perrett and Taino (2000) conclude that a split-off distributes the subsidiary company shares to those shareholders who prefer subsidiary company shares and therefore implies no flow-back pressure. The disadvantage of split-offs, as compared to spin-offs, is that they are more complex in terms of filing requirements and handling than spin-offs.

[50] For details on section 355 IRC, see Section 2.7.

[51] This initial stock price decline is usually associated with the portfolio rebalancing activities of large institutional investors who may not wish to hold the shares of the subsidiary given away by the parent in a spin-off transaction. The results of Low (2002) give some indication that two-step spin-offs perform better in the short term than pure spin-offs following the transaction.

stake in the subsidiary company. Hence a two-step spin-off will typically be a more complex and a longer process, as it is a combination of two transactions; however, it may help better prepare for the ultimate separation.

2.4.2.2 Germany

The first step for German carve-outs is the transfer of assets and liabilities (*"Ausgliederung"* based on Section 123 (3) UmwG). The second step is a public sale in an IPO.[52] As stated in Semler and Stengel (2003), companies can, by one single act, transfer all or part of their assets and liabilities to another legal entity. This transfer does not formally affect the shareholders of the parent company, as the shareholders keep their positions in the parent company without becoming shareholders in the subsidiary company. As stated in section 123 (3) UmwG, the assets and liabilities can be transferred to an existing or a new company. According to Semler and Stengel (2003), the main difference of an *"Ausgliederung",* as compared to an *"Aufspaltung"* or an *"Abspaltung",* is that there is no capital reduction in the parent company and that there is no external audit required (section 125 UmwG).[53]

The factors to be taken into account for the second step of a carve-out will generally be those relating to a listing of any company (see 2.4.1.2). The rights issues of the parent company shareholders to subscribe for the subsidiary company equity issue must first be removed. As in any IPO, there is the mandatory publication of an IPO prospectus. The board of the parent company must disclose its decision for the transaction as soon as the decision is made. The listing and registration requirements are usually specific to the selected stock exchange.

2.4.2.3 Switzerland

As in the USA and in Germany, equity carve-outs in Switzerland involve a two-step legal process. The first step is the transfer of assets and liabilities *("Vermögensübertra-*

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[52] Before the introduction of the Corporate Reorganization Act, carve-outs in Germany had to be conducted with transfers of singular title as for example in the first carve-out in Germany, the carve-out of Kolbenschmidt AG as a subsidiary of Metallgesellschaft in 1984 (Nick, 1994). For detail on the process with transfer of singular title, see Heidkamp (2003).

[53] For other regulations such as the three key steps and its components (Achleitner and Wahl, 2003), see Section 2.4.1.2.

gung", according to Section 68 FusG) and the second step is the public sale in an IPO. As stated in Von der Crone et al. (2004b), the newly instituted transfer of assets and liabilities allows a company registered in the Commercial Register to transfer, by one single act, the so called "universal succession", transferring all or part of its assets and liabilities to another legal entity. The transfer of assets and liabilities does not formally affect the shareholders of the parent company; the shareholders keep their positions in the parent company without becoming shareholders in the subsidiary company. A transfer of assets and liabilities is based on the transfer contract (section 70 and 71 FusG), and the assets and liabilities to be transferred must be inventoried. The inventory is not only the basis of the transfer of assets, but also defines its scope and extent. The transfer becomes legally binding upon entry in the Commercial Register. To protect creditors and employees, the transferring company is jointly and severally liable with the absorbing company for the transferred liabilities for three years (section 75 FusG). The requirements regarding disclosure are limited (section 74 FusG): The parent company shareholders must be informed about the transfer of assets and liabilities, including its conditions. If the transferred assets and liabilities account to less than 5% of the parent company's total in the balance sheet, there is no duty of disclosure.[54] The second step of a Swiss carve-out is then a normal IPO. As in the USA and Germany, either the parent or the subsidiary company can sell the shares at the IPO.

2.5   Governance Implications

In order to better understand the specific governance implications of spin-offs and carve-outs, first an overview of the leading governance principles in the USA, Germany and Switzerland is presented.[55]

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[54] There are more demanding requirements if the transfer of assets and liabilities makes it impossible for the parent company to follow the company's purpose as stated in the bylaws. If this is the case, the transfer of assets and liabilities requires an amendment of the bylaws and thus the consent of shareholders in a general meeting.

[55] Hofstetter (2002) or Giger (2003) provide a more detailed overview on the Swiss corporate governance regulation and the differences compared to other countries. Despite fundamentals differences between corporate governance in USA, Germany and Switzerland, "good" corporate governance results in all three

In Switzerland, the board of directors (as required in the Code of Obligations) is a unitary board. It is therefore similar to the one-tier system of Anglo-Saxon law and differs from the two-tier system embodied in German law. In Switzerland, the division of functions between the executive and supervisory board reduces the tasks of the latter to essentially a monitoring role.[56] On the other hand, the US system is significantly more flexible and leaves the company considerable freedom to apportion powers between the board and the management.[57] The Swiss Code of Obligations also leaves considerable organizational discretion to the board. Only the responsibility for key areas of the board of directors (listed in section 716a Code of Obligations) cannot be delegated upwards, that means to the annual general assembly, or downwards, to the executive management. In Germany, a dual board system is legally prescribed for stock corporations: the management board is responsible for managing the enterprise.[58] Its members are jointly accountable for the management of the company. The supervisory board appoints, supervises and advises the members of the management board and is directly involved in decisions of fundamental importance to the company. Specific to Germany is the co-determination of the supervisory board; half of the members of the supervisory board

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countries in a higher valuation (Drobetz, Schillhofer, and Zimmermann, 2003; Beiner et al., 2004; McKinsey & Company, 2000).

[56] The sources for corporate governance in Switzerland are primarily the relevant laws and regulations. These include corporate law embodied in the CO, stock market law (SESTA and pertaining ordinances) and the listing rules of the SWX. Attention must also be given to the legal reality in Swiss companies, including the articles of incorporation, the regulations and prevailing usages. In 2002 the "Swiss Code of Best Practice for Corporate Governance" and the "SWX Swiss Exchange Directive on Information relating to Corporate Governance" were established. The purpose of the former is to set out guidelines and recommendations, but not force Swiss companies into a straightjacket, while the directive is intended to encourage issuers to make certain key information relating to corporate governance available to investors (Giger, 2003).

[57] In the USA, the discussion of corporate governance became particularly lively in the 1980s and 1990s, leading ultimately to the "Blue Ribbon Report" on the independence of the audit function and on the audit committee. Key requirements in the USA are based on the corporate governance standards of the respective stock exchange and the Sarbanes-Oxley Act, which was one of the measures used to rebuild tarnished confidence of investors following corporate scandals such as Enron and Worldcom.

[58] Details on the German terms on corporate governance are based on the law of control and transparency in corporate matters (KonTraG) and the German Corporate Governance Code.

must be labor representative.[59] Through co-determination, employees are thus guaranteed a significant voice in the process of corporate decision-making in Germany.[60]

The key point regarding governance implications of spin-offs and carve-outs is whether the transaction requires shareholder approval or not.

2.5.1   Spin-offs

2.5.1.1   USA

According to the SEC (2004) and Blanton, Perrett and Taino (2000), shareholder approval is not a formal requirement in the USA for spin-offs since a spin-off is a dividend distribution; only the approval of board of directors is needed. However some state laws require shareholders vote if all or most of the assets of the parent company are distributed. Glover (2002) states that in making its decision, the board must fulfill its fiduciary duties of good faith and due care in designing and effecting the transaction. If it satisfies this requirement, it will ordinarily enjoy the protections of the business judgment rule. As said by Blanton, Perrett and Taino (2000), the parent company installs a board of directors for the subsidiary company in US spin-offs prior to the transaction. The subsidiary company board is subject to the normal shareholder approval and confirmation after the transaction. The board members of the subsidiary company are appointed at discretion of the parent company. However, to benefit from tax exemption, none of parent company's directors or officers may serve as director or officer of the subsidiary company.

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[59] Co-determination laws apply to all corporations in Germany with at least 500 employees. Additionally, there is another kind of co-determination in Germany in the works councils.

[60] Zugehör (2001a) shows that there are significant differences in the extent labor representative are involved. He mentions on the one hand, the restructuring of VEBA AG with a high involvement of labor representatives. On the other hand, Siemens's presentation of its demanding 10-point corporate restructuring program to the supervisory board without any prior discussion with workforce representatives is an example of low level of co-determination. The value added of the employee determination is challenged by Gorton and Schmid (2000); companies with equal representation of employees and shareholder representatives on the supervisory board trade at a 31% stock market discount, compared with companies where the subsidiary board composes only one-third of employee representatives.

2.5.1.2   Germany

The Corporate Reorganization Act explicitly regulates that both the parent and the sub-
sidiary firms' shareholders must approve a spin-off, split-off or a split-up by a three-
quarters majority of the share capital represented at the respective shareholders' meet-
ings (sections 125 (1), 13 (1) and 65 (1) UmwG). Having this approval, the parent com-
pany, as the sole shareholder of subsidiary company prior to the spin-off, can appoint
new shareholder representatives to the supervisory board of the subsidiary company.
These members will only be appointed until the next annual general meeting of the sub-
sidiary company, at which subsidiary company shareholders can appoint new supervi-
sory board members. The composition of the supervisory board under the German Co-
Determination Act must be confirmed in a special proceeding in accordance with section
97 of the Stock Corporation Act. The subsidiary company employees in Germany, in
accordance with the provisions of the Co-Determination Act, elect the employee repre-
sentatives to the subsidiary company supervisory board.

2.5.1.3   Switzerland

In terms of decision making (according to sections 36 (3) and 43 FusG and Watter and
Reutter, 2002) for Swiss spin-offs, split-offs and split-ups, the general assembly shall
resolve all issues regarding the transaction i.e., the general assembly has to approve the
contract and plan. An asymmetrical split-off or split-up requires the consent of at least
90% of all shareholders (section 43 (3) FusG). Upon consent by the general meeting,
with the required quorum, the spin-off takes effect with the entry into the Commercial
Register. In case of a split-up, the parent company is simultaneously deleted. The new
Swiss Merger Act does not comment on the board composition, so the normal rules ap-
ply, hence the general assembly elects the supervisory board members.

2.5.2   Carve-outs

2.5.2.1   USA

According to Blanton, Perrett and Taino (2000), the factors to be taken into account for
carve-outs will generally be those relating to the listing of any company. That means
there is no formal requirement for shareholder approval, unless the shares sold represent

all or almost all of the parent company shares. The parent company installs or confirms the board of directors of the subsidiary company prior to the listing.[61] As stated in Blanton, Perrett and Taino (2000), nomination of independent non-executive directors to represent interests of minority shareholders is required. The subsidiary company board members are then formally appointed at the discretion of the parent company as the parent company usually still has the majority of votes. Practically, however, the composition should reflect the new shareholding structure.

2.5.2.2   Germany

The general assembly of the parent as well as of the subsidiary company must approve the first step of a carve-out, the transfer of assets and liabilities by a three-quarters majority of the share capital represented at the respective shareholders' meetings (Sections 125 (1), 13 (1) and 65 (1) UmwG).[62] For the second step of the transaction, the IPO, the general assembly of the parent company must agree if the carve-out reflects a considerable share of the parent company (Trapp and Schick, 2001). The definition of considerable share is not clear; according to Achleitner and Wahl (2003), it is in the range of 8.5% to 25% of the revenues, equity or the assets or liabilities. If the carve-out is conducted as a secondary carve-out, the shareholders of the parent company must get rights issues. The suspension of rights issues by the general assembly is possible but requires specific factual justification. Trapp and Schick (2001) state that there are no other additional rights for the shareholders of the parent company in an IPO of a subsidiary company. The supervisory board election of the subsidiary company takes place according to the normal German process including co-determination of employees (according to the German Co-Determination Act); the listing requirements are the same as for any IPO and specific to the selected stock exchange.

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[61] Schipper and Smith (1986) find that in 34 out of 48 carve-outs the president or CEO of the subsidiary firm used to be manager in the parent firm and that in 56 out of 57 carve-outs the board of directors of the subsidiary includes at least one member that is also a director or officer in the parent firm. Boone (2002) shows based on a sample of 220 equity carve-outs that the subsidiary board composition is affected by product market relationships with the parent firm as there is greater executive and board overlap in cases with product market relationships between the firms.

[62] For governance implications of German carve-out using the transfer of singular title approach, see Heidkamp (2003).

2.5.2.3   Switzerland

A transfer of assets and liabilities is based on the transfer contract to be concluded by the executive body of the involved legal entity (section 70 FusG and Von der Crone et al., 2004b). The transfer of assets and liabilities does not require approval by the shareholders of the parent company. Regarding the IPO, the second step of a carve-out the governance requirements depend on whether it is a primary or a secondary carve-out. As already stated in section 2.5.1.3, the Swiss Merger Act does not comment on the board composition. Therefore, the normal rules apply that the general assembly elects the supervisory board members.

2.6   Accounting Implications

National and international accounting standards may have significant implications on the choice of divestiture methods. One of the key issues is that if more than half of a subsidiary company shares are carved-out or given to the initial shareholders in a spin-off, the subsidiary company no longer can be consolidated (Anslinger et al., 1997).

2.6.1   US GAAP

In determining the annual profit, the US Generally Accepted Accounting Principles (US GAAP) differentiate between continuing and discontinuing operations.[63] A subgroup of the discontinuing operations are the discontinued operations, which cover business areas of the parent company that were already given up or for which a concrete, formal plan exists to give it up (APB, 1973b; and Boadnarine, 1995). Business areas for which an equity carve-out, spin–off, split-off or a split-up is planned, therefore have to be classified in the books of the parent company as discontinued operations. As such, the parent's current and prior financial statements are recast so that the income or loss from the operations of the discontinued segment is reported (net of tax) on the face of the income

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[63] For details on US GAAP, see Delaney et al. (2004) or Grünberger (2003).

statement as a component of income before extraordinary items.[64] The deadline for changing the accounting for businesses that are planned for public ownership restructuring transactions is the point of time when the management decides the restructuring measure (Bertschinger, Haag, Marty, 1997). Starting from this point, US GAAP defines detailed, specific valuations methods and other instructions.[65]

2.6.2   IFRS

International Financial Reporting Standards (IFRS) formerly known as International Accounting Standards (IAS) classifies business areas foreseen for public ownership restructuring transactions as "discontinuing operations".[66] Section 35 IAS is a presentation and disclosure standard (PWC, 2004). It aims to establish a basis for separate information about a major operation that the firm is discontinuing from information about its continuing operations and (2) to specify minimum disclosures about the discontinuing operation. It focuses on how to present a discontinuing operation in the parent company's financial statements and what information to disclose. Contrary to US GAAP, IFRS does not establish any new principles on how to recognize and measure the income, expenses, cash flows, and changes in assets and liabilities relating to discontinuing operations. It instead requires from the companies to follow the general principles of IFRS (PWC, 2004). Under section 35 IAS, initial disclosures about a discontinuing

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[64] Though reclassification is only permitted if the spin-off occurs in connection with the initial registration of a company under the Securities Act or Securities Exchange Act and the parent and the subsidiary are (1) in dissimilar businesses, (2) have been managed and financed historically as if they were autonomous, (3) have no more than incidental common facilities and costs, (4) will be operated and financed autonomously after the spin-off and (5) will not have material financial commitment, guarantees or contingent liabilities to each other after the spin-off (Schnee, Knight, and Knight, 1998; and APB, 1971).

[65] APB (1973a) provides instructions on the accounting for spin-offs by the parent company. It says that spin-offs are nonreciprocal transfers to owners that "should be based on the recorded amount of the non-monetary assets distributed." Thus, the distributing corporation treats the distribution as a dividend (Schnee, Knight, and Knight, 1998). For details on the valuation methods, see Kudla and McInish (1983); Delaney et al. (2004) or http://www.fasb.org/.

[66] Section 35 Par. 2 IAS: „A discontinuing operation is a component of an enterprise (a) that the enterprise, pursuant to a single plan, is disposing of in its entirely (...) disposing of piecemeal (...) or terminating through abandonment; (b) that represents a separate major line of business or geographical area of operations: and (c) can be distinguished operationally and for financial reporting purposes".

operation must be included in the financial report in the period in which the initial disclosure event for that discontinuing operation occurs. Those disclosures must then be updated in subsequent reporting periods (PWC, 2004). Further impairment may become evident in the course of carrying out the plan. The entity should re-estimate the recoverable amount of the assets and recognize any additional impairment loss or where appropriate any reversal.

2.6.3   German Commercial Code and German GAAP

In contrary to US GAAP and IFRS, the German Commercial Code (*"Handelsgesetzbuch"*) and German Generally Accepted Accounting Principles (German GAAP) do not have regulations about disclosure before and during the transaction. Only the reporting after the transaction is regulated to acknowledge the method and the circumstances of the transaction. According to section 17 (2) UmwG, the parent company is obliged to generate a closing balance sheet and eventually an intermediate balance sheet in order to get an entry into the Commercial Registry. The subsidiary company has two options for the valuation of assets and liabilities: Either with book value as in the closing balance sheet of the parent company or with the purchasing cost including a premium (section 253 (1) HGB).[67] Details of the German Commercial Code are not discussed in this paper as the EU regulation 1606/2002 issued on July 19, 2002 requires listed companies throughout the European Union to use IFRS by 2005.[68]

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[67] For details on the accounting implications of *„Ausgliederungen"* see Linssen (2001).

[68] The EU Commission argued that in order to contribute to a better functioning of the internal market, publicly traded companies must be required to apply a single set of high quality international accounting standards for the preparation of their consolidated financial statements. Unlike directives, EU regulations have the force of law without requiring transposition into national legislation. Member states have the option of extending the requirements of this regulation to unlisted companies and to the production of individual accounts. European companies applying US GAAP to date received an extension and have a January 1, 2007 deadline of applying IFRS (sections 4 and 9 EU regulation).

2.6.4 Swiss GAAP ARR

Similar consequences as the EU regulation for EU-listed companies have instructions of the SWX for companies listed in Switzerland. In 2002 to make the financial statements of these companies more easily comparable, the SWX required that financial statements of companies (listed on the main trading segment of the SWX) must be prepared in accordance with IFRS or US GAAP in order to be admitted to listing from 2005 onwards.[69] Therefore this paper does not comment on the implications of public ownership restructuring transactions in Swiss Generally Accepted Accounting Principles/Accounting and Reporting Recommendations (Swiss GAAP ARR).

2.6.5 Spin-offs

2.6.5.1 US GAAP

Blanton, Perrett and Taino (2000) and Maydew, Schipper and Vincent (1999) show that the accounting impact associated with a distribution of shares are not onerous to either the parent or the subsidiary. The parent will record the spin-off at book value adjusted for any impairment of value and will not recognize a gain or loss. Stockholders' equity will decrease by the net amount recorded on the parent's balance sheet for the assets and liabilities of the subsidiary. The subsidiary company itself is then required to prepare its own financial statements, including all required disclosures. The spun-off subsidiary company's accounts remain at historical cost amounts. The spin-off does not trigger the need for adjustments to fair values; hence no goodwill is created (Blanton, Perrett and Taino, 2000).

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[69] Swiss GAAP ARR will continue to be recognized for smaller companies, which have no international shareholder base and are listed in the SWX Local Caps segment. These recommendations are based on IFRS principles, but their scope and disclosure regulations are far less complex and extensive than IFRS or US GAAP. They do, however, observe the fundamental principles of international financial reporting, according to the tenet of a true and fair view. Unlike the EU, the Admission Board of the SWX will continue to accept US GAAP as a reporting standard after 2005. By doing so, it relieves all companies with a dual listing in Zurich and New York and of their obligation to include transitional accounts from IAS to US GAAP in their financial statements. Several organizations such as the International Accounting Standards Board and the International Organization of Securities Commissions would like to go yet a step further and eliminate all significant differences between IFRS and US GAAP by the end of 2004.

2.6.5.2   IFRS

Spin-off transactions, where ownership of the discontinuing operation is transferred to the entity's existing shareholders, could be viewed as a different form of a sale of operations or abandonment (PWC, 2004). These transactions should be accounted for as business reorganizations. According to section 27 IAS, a subsidiary is no longer consolidated from the date when the parent no longer has control. Gains or losses on the disposal of a subsidiary are calculated by comparing the proceeds received to the carrying amount of the parent's share of the subsidiary's net assets, including any goodwill (PWC, 2004). However, as there are no proceeds in a spin-off, there is by using IFRS as by using US GAAP no goodwill created.

2.6.6   Carve-outs

2.6.6.1   US GAAP

If the public offering price of the subsidiary stock is greater (less) than the book value in the parent books, the financial statement of the parent company will reflect a gain (loss) net of direct transaction costs (Blanton, Perrett and Taino, 2000). The parent company can elect to record such a gain (loss) in its income statement or directly to the shareholders' equity. Hand and Skantz (1999a) find that the majority of the parent firms book the gain on their income statement, which leads that parents' net income in the year of the transaction will likely overstate the operating performance. If reported on the income statement, the gain (loss) should be presented as a separate line item in the income statement and be clearly designated as non-operating income. The accounting does not change if a cash dividend is paid to the parent prior to the carve-out by the subsidiary. Such a dividend could affect the size of the gain or loss reported by reducing the parent's carrying value in the subsidiary shares. The parent will also be required to provide for income taxes that are immediately payable and perhaps record deferred taxes on any gain depending on its future plans. As stated in Anslinger et al. (1997), selling more than 50% of the voting interest in the subsidiary company results in deconsolidation for financial reporting purposes. If the parent company's interest were between 20% to 50%, the parent would account for its holding under the equity method and for less than 20%, the parent would use the cost method of accounting for the carved-out subsidiary company.

2.6.6.2   IFRS

According to PWC (2004), carve-outs, where parents retain control, can be treated as disposal of a partial interest. This requires the elimination of an appropriate proportion of not amortized goodwill and those fair value adjustments that have not yet been consumed or amortized, together with an appropriate change in the minority interest. When a parent company disposes of an interest in a subsidiary such that it no longer retains control, significant influence or joint control, the interest becomes an investment and is subject to the guidance in section 39 IAS (PWC, 2004). Generally, such investments would be part of available-for-sale assets and recorded at fair value. The gain or loss on a partial disposal is the difference between the proceeds received and the carrying amount of the parent's share of the net assets sold, plus or minus any differences between the remaining carrying value and the fair value of the investment. Subsidiaries are included in the consolidated financial statements, more specifically the income and cash flow statements, up until the date when consolidation is no longer appropriate, generally the date of disposal (sections 27 and 31 IAS).

2.7   Tax Implications

This chapter intends to give an overview on tax implications of spin-offs and carve-outs in the USA, Germany and Switzerland. Differentiations need to be made between the tax implications for the parent company, the subsidiary company and the shareholders of the parent company. Spin-offs and carve-outs are complex and in all cases, it is vital to cooperate with local, specialized tax experts and lawyers. Key questions regarding the tax implications are: (1) whether hidden reserves will be disclosed due to the transaction; (2) whether the transaction itself generates a taxable capital gain; and (3) whether the parent and the subsidiary companies remain a tax group after the transaction (Achleitner and Wahl, 2003).

Table 1 summarizes the conditions for tax-neutral spin-offs and carve-outs in the USA, Germany and Switzerland as subsequently derived in Section 2.7.1 and 2.7.2. The tax environment is most favorable for spin-offs in the United States and Switzerland and for carve-outs since 2001 in Germany.

Table 1: Tax Neutrality of Spin-offs and Carve-outs

	USA	Germany	Switzerland
Spin-off	Yes, under favorable conditions	Yes, under very demanding conditions	Yes, under favorable conditions
Carve-out			
1ˢᵗ step:	Yes (section 351 IRC)	Yes (section 20 UmwStG)	Yes (section 69 (1) FusG)
2ⁿᵈ step:			
Primary	Yes	Yes	Yes, under certain conditions
Secondary	No	Yes, under certain conditions (section 8b KStG)	Yes, under certain conditions

Not all transactions meet the requirements for being tax-free. Krishnaswami and Subramaniam (1999) and Copeland, Lemgruber, and Mayers (1987) show empirically that taxable spin-offs in the USA are associated with lower positive abnormal returns than non-taxable spin-offs. They interpret these results as evidence that taxes impose like a penalty on shareholder gains.

2.7.1 Spin-offs

As common drawback of spin-offs in all three countries, is that after the completion of the transaction parent and subsidiary company cannot build a tax group anymore and that they hence are not treated as a single unit for tax purposes.

2.7.1.1 USA

One of the key elements of spin-offs in the USA is that they can be conducted tax-neutral on the level of the parent and the subsidiary company as well as on shareholder level. Most US companies planning spin-offs seek to clarify the tax situation by tax rulings from the Internal Revenue Service (IRS) before the transaction.[70] In specific situations tax benefits may even be the primary motivation for spin-offs (Kudla and McInish, 1983). The Internal Revenue Code (IRC) of 1954 and 1986 provides in section 355 and

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[70] However, in 2003 the IRS changed their attitude regarding tax rulings and said that it won't issue rulings on three of the most important aspects of spin-offs, including whether there is sufficient business purpose to the spin-off for the IRS to treat it as tax free anymore (See Forbes, 2003).

368 (a) special rules for the distribution of stock and securities of a controlled corpora-
tion.[71] If the requirements of these sections are met, the Code allows tax-free treatment
on corporate as well as shareholder level. According to Suchan (2004) the basic idea
behind these provisions is to prevent tax avoidance schemes. In the context of section
355 IRC two principal concerns might be the driving forces: Spin-offs could be used (1)
to convert ordinary dividend income at the shareholder level into capital gain, and (2) to
transfer appreciated property out of the corporation without triggering tax on the corpo-
rate level. The starting point in evaluating tax implications and the first condition for a
tax neutral spin-off is that the parent company controls the subsidiary company before
the transaction (Kudla and McInish, 1983):

1. According to section 368c IRC, the parent must own at least 80% of the total com-
   bined voting power of all classes of stock entitled to vote and at least 80% of the to-
   tal number of shares of all other classes of stock of the corporation.

Section 355 IRC specifies the other requirements for a spin-off to qualify as a non-
taxable spin-off:

2. The transaction must have a valid business purpose; according to section 355a IRC,
   "The transaction was not used principally as a device for the distribution of the earn-
   ings and profits of the distributing corporation or the controlled corporation or both".

3. The parent must distribute at least 80% of its stock in the subsidiary. According to
   section 355a IRC, „The distributing corporation distributes all of the stock and secu-
   rities in the controlled corporation held by it immediately before the distribution, or
   an amount of stock in the controlled corporation constituting control within the
   meaning of section 368c".

4. The parent as well as the subsidiary company has to continue the business; according
   to section 355b IRC, "The distributing corporation, and the controlled corporation
   (...) is engaged immediately after the distribution in the active conduct of a trade or
   business".

5. Both the parent and the subsidiary companies must have actively operated the busi-
   nesses (directly or indirectly) for at least five years; according to section 355b IRC,

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[71] For details, see Bittker and Eustice (1996).

„Such trade or business must have been actively conducted throughout the 5-year pe-
riod ending on the date of the distribution".

6. The subsidiary must not have been acquired in a taxable transaction during the pre-
ceding five years. According to section 355b IRC, „Such trade or business must not
have been acquired within the period described in subparagraph (B) in a transaction
in which gain or loss was recognized in whole or in part, and control of a corporation
which (at the time of acquisition of control) was conducting such trade or business".

As stated in Schnee, Knight, and Knight (1998) the continuity of interest is an additional
condition for tax-neutral spin-offs:

7. Parent company shareholders must generally retain at least 50% of both parent com-
pany and subsidiary company shares for two years. Otherwise, contingent tax liabil-
ity will be triggered.

If these requirements are met, the parent company's capital gain on the subsidiary com-
pany share disposal is tax-exempt. The fact that there were many tax-free spin-offs in
the USA over the last 30 years shows that these conditions can be met.

Glover (2002) states that if the spin-off does not qualify as tax-free, the parent share-
holders will pay tax on the value of the spun-off company's shares that they receive in
the distribution. This tax will be assessed at normal income tax rates to the extent the
parent has current or accumulated earnings and profits. The stockholders' basis in the
spun-off company's stock will equal its value at the time of the distribution and the dis-
tributing corporation will recognize gain inherent in the stock of the controlled corpora-
tion.

2.7.1.2   Germany

With the introduction of the Corporate Reorganization Act on January 1st 1995, the re-
lated tax law the Corporate Reorganization Tax Act (*"Umwandlungssteuergesetz"*) was
also adapted and some barriers to spin-offs were removed.[72] Although the requirements
are similar to those of section 355 IRC in the USA they differ in part. Particularly sec-
tion 15 (3) UmwStG, which contains a provision disallowing the transfer of stock of

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[72] For details on the conditions for tax-neutral spin-offs in Germany, see Schultze (1997); Achleitner and
Wahl (2003); and Suchan (2004).

corporations taking part in the spin-off to third parties, is very demanding. That means that if within five years following the transaction more than 20% of one of the involved companies is sold, belated taxes for the transaction must be paid. The key issue in my view is that investors do not know the tax consequences at the announcement nor at the completion date. Consequently, Achleitner and Wahl (2003) speak about a "ban on spin-offs".[73] Additionally, under German law in the typical case of a spin-off to a newly formed subsidiary no outside ownership in the stock distributed is allowed (Suchan, 2004). The same 100% ownership is required for the parent to spin off an existing subsidiary. The transaction qualifies for tax-free treatment only, if the parent corporation has owned the subsidiary 100% for the three years prior to the spin-off.[74] Capital gain taxes, value-added taxes and real estate transfer taxes are other examples of taxes resulting from spin-off transactions for the parent company.

If the opening tax balance sheet of the subsidiary company shows the assets at the same values as those shown in the parent company tax transfer balance sheet (*sections* 15 (1), 12 (1) and 4 (1) UmwG), the transfer of assets is tax neutral for the subsidiary company. That means that there will be no taxable acquisition gain or taxable revaluation gain. While the conditions for a tax neutral transaction for the parent company are very demanding, transactions generally do not generate taxable income to parent company shareholders.[75] For Germans holding that kind of share as a business asset (*"steuerliches Betriebsvermögen"*), shareholders will be required to apportion their tax basis in parent company shares held immediately prior to the transaction between these shares held after the transaction and the subsidiary company shares received in the transaction. To the extent that parent company shares are held as non-business assets (*"steuerliches Privatvermögen"*) and the substantial participation condition of section 17 and the minimum holding period for short-term capital gains condition of section 23 of the German Income Tax Act are fulfilled, shareholders will be required to apportion their acquisition costs in the parent company shares. To the extent that any parent company shares

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[73] In Hoechst-Celanese (1999), the conclusion is drawn that, "as the requisite criteria cannot be met by a publicly-listed company". The resulting income tax to Hoechst AG was consequently estimated to be somewhere between 170 and 250 million Euros. In Hoecht-Celanese (1999) there were no capital gains taxes and no value-added tax, but real estate transfer taxes of approximately 21 million Euros.

[74] In the USA and in Switzerland, in contrast a tax-free distribution may be achieved without owning 100% of the subsidiary the stock of which is distributed.

[75] Based on Hoechst-Celanese (1999) and Hoereth, Schiegle, and Zipfel (2001).

are tainted by a blocking amount (within the meaning of section 50c of the German In-come Tax Act), a portion of this amount will be allocated to the subsidiary company shares (section 13 (4) UmwStG). That kind of spin-off is also tax-neutral for US and UK citizens, assuming the spin-off qualifies as a tax-free transaction (section 355 IRC) and a scheme of reconstruction or amalgamation (section 136 of the British Taxation of Chargeable Gains Act of 1992).

2.7.1.3 Switzerland

The key objective of the Merger Act was to facilitate mergers and restructuring transac-tions. This implies that these transactions can be conducted in a tax-neutral way.[76] As most of these transactions did not trigger income and profit taxes already in the old law, there were few changes required in the tax laws (Kumschick, 2001, ESTV, 2004). As stated in Von der Crone et. al (2004c) and ESTV (2004) there are four key requirements to avoid income and profit-taxes (section 8 (3) and section 24 (3) StHG as well as sec-tion 19 (1) and section 61 (1) DBG):

- The tax liability of the companies involved must continue after the restructuring in Switzerland.[77]

- The past book values of assets and liabilities must be transferred.

- The hidden reserves must not be realized.

- The assets must reflect as a whole a business that means the hidden reserves should be objectively linked with its business environment (section 24 (3) lit. b StHG and section 61 (1) lit. b DBG).

Unlike the old regulation, there is for spin-offs no blocking period condition anymore (ESTV, 2004). As stated in Von der Crone et. al (2004c), Neuhaus and Brauchli-Rohrer (2002) and Swiss-American Chamber of Commerce (2003), spin-offs and transfer of assets and liabilities are subject to specific conditions exempted from dividend withhold-

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[76] For details on the tax implication of spin-offs, split-offs and split-ups, see Neuhaus and Brauchli-Rohrer (2002) and ESTV (2004).

[77] According to Swiss American Chamber of Commerce (2003), cross-border reorganizations are income tax neutral to the extent that a taxable presence at least in the form of a permanent establishment is maintained in Switzerland.

ing tax (section 5 (1) VstG), stamp duties and share issuance taxes (section 6 (1), 13 (2) and 14 (1) lit. b StG), and transfer duties on real estate. But according to Von der Crone et. al (2004c) and Neuhaus and Brauchli-Rohrer (2002), companies are required to pay VAT (section 47 (3) MWStG together with section 9 (3) MWStG). In Switzerland there is no capital gain tax for private individuals. However there may be tax implications for shareholders of the parent company, depending on whether there are compensation payments or other cash benefits such as an increase in nominal value (section 7 (1) StHG, section 20 (1) c DBG; Watter and Reutter, 2002; ESTV, 2004).

2.7.2   Carve-outs

Assessing tax consequence of carve-outs in the USA, Germany and Switzerland, one must differentiate first between the two steps of carve-outs and second between primary and secondary carve-outs.

2.7.2.1   USA

As outlined in Myers (2002) the tax implications of the first step of carve-outs; the creation of a new legal entity and the consequent transfer of assets and liabilities into the new legal entity, are not onerous.[78] For federal tax reporting purposes, U.S. companies can continue to file a consolidated return for parents and subsidiaries in which they own at least an 80% stake. There might even exist benefits in terms of taxes of the new structure at the state and/or international levels.[79] The key point in evaluating tax implications of US carve-outs is rather the difference between primary and secondary carve-outs (Anslinger et al., 1997). In a secondary carve-out, the parent company sells some of its subsidiary company stock to outside investors via an IPO. To the parent company, the

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[78] A broad discussion of alternatives for tax-efficient divestitures of subsidiary companies such as carve outs, can be found in Willens and Zhu (1999).

[79] Myers (2002) explains that many states tax companies on all of their income, regardless of where it was generated. But some, such as Pennsylvania and Michigan, allow subsidiaries to file returns that tax only the earnings generated within the state's borders, not those generated in other locations. Companies that operate internationally can also set up foreign businesses as separate subsidiaries. Typically, the profits of those subsidiaries will then be taxed abroad where the subsidiary is incorporated and will not be subject to U.S. taxes.

subsidiary company shares it owns are assets and like any asset, its sale triggers recognition of a gain or loss for tax purposes. Since stock is a capital asset, the gain or loss on sale is a capital gain or loss and will be taxed at the corporate capital gains tax rate. The amount of taxable gain or loss is the difference between the proceeds from the carve-out and the parent company's tax basis in the stock of the subsidiary company. The tax rules that govern a parent's basis in the stock of its subsidiary company work in much the same way as the financial accounting rules for equity method investments. Thus, the parent's tax basis in the subsidiary stock increases when the subsidiary reports taxable income and decreases when the subsidiary pays dividends to the parent.

Unlike a secondary carve-out, a primary carve-out triggers no gain or loss for tax purposes, because a corporation cannot recognize a taxable gain or loss in its own stock. Since the subsidiary company, not the parent company, sells the subsidiary stock to investors, there is no gain or loss recognition for tax purposes. A primary carve-out has no effect on the parent company's tax basis in the stock of the subsidiary that it owns. However, the parent company in a primary carve-out may wish for some or all of the proceeds to reside at the parent level, as they do in a secondary carve-out. This can be achieved by having the subsidiary company pay the parent a dividend before the carve-out equal to the expected net proceeds. According to Blanton, Perrett, and Taino (2000), there are no tax consequences to the parent unless the dividend is greater than the aggregate tax basis in the subsidiary.

If the amount of stock sold causes the parent's voting or economic interest in the subsidiary not to fall below 80%, the parent can continue to consolidate its subsidiary ownership for tax purposes.[80] As a consequence, dividend payments from the subsidiary company to the parent company are non-taxable and losses of one group member can be used to offset income of profitable members of the affiliated group (Suchan, 2004). With this in mind, it is astonishing that 37% of all carve-outs in the USA are secondary carve-outs although they appear to be tax-disadvantaged as they trigger sizable capital gain taxes for parent companies that could be avoided if primary shares were issued in-

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[80] According to section 351a IRC carve-outs can be conducted tax neutral as long as the parent company is in control and it is a primary carve-out. Control means (according to section 368c IRC) that the ownership of stock possesses at least 80% of the total combined voting power of all classes of stock and is entitled to vote and holds at least 80% of the total number of shares of all other classes of stock of the corporation.

stead.[81] Once the transaction is completed, consolidation for tax purposes is only possible if the parent company controls at least 80% of the subsidiary company based on voting rights and capital (Anslinger et al., 1997). With at least 80% ownership, the parent company can distribute the remaining shares in a tax-free distribution such as a spin-off (section 355 IRC).

2.7.2.2 Germany

Assessing tax consequence of German carve-outs, one must also differentiate between the two steps of a carve-out. The tax-neutral implementation of the first step the transfer of assets and liabilities of the subsidiary company out of the parent company (according to the Corporate Reorganization Act) has two requirements: First (according to section 20 (2) UmwStG) the subsidiary company must continue to account for the assets and liabilities with the same book value as in the parents books and secondly (according to section 20 (4) UmwStG) the parent company must record the received subsidiary shares with the same book value as the transferred assets.

As in the USA, one has to differentiate in the second step between a primary and a secondary carve-out. As in the USA, primary carve-outs do not lead to any taxes while with secondary carve-outs; if the proceeds of the IPO are bigger than the book value in the parent company, capital gains arise that used to be subject to capital gain taxes. In December 1999, Germany's government made a surprise announcement that it would lower the corporate capital gains tax rate from 50% to zero on sales of German equity investments (crossholdings). According to Achleitner and Wahl (2003), thanks to this German tax reform in 2001, capital gains from selling stakes in other companies are tax-free under certain conditions. The conclusion is that the tax environment for carve-outs is more attractive in Germany than in the USA (and in Switzerland).

According to Suchan (2004) there are no tax groups foreseen in the German tax law. Nevertheless, the tax treatment of the so-called *"Organschaft"* provides similar relief. Under these rules income or loss of a controlled company is attributed to the controlling company and the controlled company is only taxed on payments to minority shareholders. To qualify for *"Organschaft"*, a profit and loss pooling agreement must be in place,

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[81] Corporate capital gains tax rates of parent companies that are measured on a marginal basis and that take into account the extent to which the carve-out gain would have otherwise been deferred, are on average only one-fifth of the statutory capital gains tax rate (Hand and Skantz , 1999a).

and the controlling company must hold the majority of voting stock of the controlled corporation.

2.7.2.3   Switzerland

As in Germany and the USA, one has to delineate the two steps of carve-outs in Switzerland as well. The tax neutrality of the first step, the transfer of assets and liabilities (according to section 69 (1) FusG) of the subsidiary company out of the parent company, is subject to five key requirements (Von der Crone et. al, 2004c; ESTV, 2004):

- The tax liability of the companies involved must continue in Switzerland, after the restructuring (section 61 (1) DBG).

- The past book values of assets and liabilities must be transferred and the hidden reserves must not be realized (section 61 (1) DBG).

- The assets and liabilities must reflect as a whole a business and the hidden reserves should be objectively linked with its business environment (section 61 (1) lit. d. DBG).

- The parent company must retain a minimum of 20% of the subsidiary company (Swiss-American Chamber of Commerce (2003) and section 61 (1) lit. d. DBG).

- The assets and liabilities must not be directly or indirectly sold for a price higher than the book values within the blocking period of five years, otherwise this leads to belated taxation of the transferred hidden reserves (section 61 (2) DBG).

The second step of the carve-out process is then the sale of shares of the subsidiary in an IPO. As in other countries, it matters whether it is a secondary carve-out, where the parent company sells some of its subsidiary company stocks to outside investors or a primary carve-out, in which the subsidiary sells newly issued stock to investors. Usually the carve-out cannot be conducted tax neutral as the IPO takes place within the blocking period and the share price is higher than the book value. The tax differences between primary and secondary offerings are not as obvious in Switzerland as in the USA and Germany. While primary offerings cause share issuance taxes of 1%, the tax implications of secondary offerings depend on the tax situation of the shareholders.[82] For natu-

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[82] The stockholding of natural persons in Switzerland is classified as (1) for private purposes, (2) for professional purposes or (3) for business purposes. Corporate bodies are classified as "normal corporate body" or

ral persons holding the stocks for private purposes there is no capital gains tax in Swit-
zerland (Von der Crone et. al, 2004c). However, even for such shareholders, there may
be tax implications depending on whether compensation payments or other cash benefits
such as an increase in nominal value are granted (section 7-(1) StHG und section 20-(1)
c DBG).

2.8   Other Implications

Apart from the implications described above, spin-offs and carve-outs also influence the
composition of stock market indexes and the terms and conditions of existing derivatives
with the parent firm as underlying.

If the parent company is included in stock market indexes, spin-offs and carve-outs lead
to changes in the composition of these indexes. The subsidiary company must meet cer-
tain criteria to be included in the index for example in terms of size, industry representa-
tion or liquidity. If the subsidiary meets these criteria, it will be added to the index on
the distribution date of the subsidiary shares. According to Blanton, Perrett and Taino
(2000), this occurred in the spin-off of Palm out of 3Com. 3Com moved to the S&P
Midcap 400 index, while its subsidiary Palm replaced it in the S&P 500. If subsidiary
companies are included in an index, other companies usually will become excluded from
the specific index. Goetzman and Garry (1986) show that there is a persistent negative
price effect for six companies, which were removed from the S&P 500 due to the inclu-
sion of the subsidiary companies resulting from the AT&T split-up in 1984.[83] On the
other hand, if the parent company is compromised in an index and the subsidiary does
not meet the criteria for inclusion, then index funds that receive the pro-rata distribution
will not hold on to the subsidiary shares. This may cause downward pressure on the
subsidiary's stock price.[84] Recirculation of subsidiary shares may also occur if the

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as a "holding company" (Neuhaus and Brauchli-Rohrer, 2002, section 5(1) together with 8 (1) StG). The
tax implications for both, natural persons and corporate bodies are dependent on these classifications.

[83] AT&T Corp. over its long history has gone from a small business built around a revolutionary invention to
a corporate giant that then conducted various ownership restructurings. In 1984 it split-up into a national
telephone company and seven regional telephone companies ("baby bells").

[84] Practitioners are aware of the influence of spin-offs on index constitution. Goldman Sachs (2003) docu-
ments (based on a study of 131 spin-offs between 1992 and 2003) that spin-off subsidiaries (which are in-

valuation characteristics such as "growth" versus "value" of the subsidiary and parent
are different and they will attract different types of investors. Brown and Brook (1993)
document that the initial flow back pressure for spin-offs is mainly caused by institutions
that divest subsidiary stocks and that this price pressure is a function of parent and sub-
sidiary firm characteristics. Abarbanell, Bushee, and Raedy (2001) confirm that spin-
offs create new firms with characteristics markedly different from the original firm; insti-
tutional investors that are committed to certain investment styles or subject to fiduciary
restrictions thus have incentives to rebalance their portfolios at the time of the spin-off.

Spin-offs and carve-outs usually also lead to adaptations in the terms of derivatives with
the parent company as underlying (Kudla and McInish, 1983). For example, due to the
spin-off of Lonza out of Algroup, the conditions (i.e., the underlying and the strike) of
all warrants, options and structured products had to be adapted.[85] The conditions of
employee stock option plans must also be modified (Gaughan, 1999).

2.9 Appraisal of Implications

Although there are many parallels among spin-offs and carve-outs, there are also five
key differences: the extent and type of external financing involved, the tax implications
of the transaction, the degree of subsequent control retained by the parent company, the
change in the shareholder base and the typical trajectory. While spin-offs do not gener-
ate cash proceeds nor cause taxes in general, carve-outs do. Hence, managers planning
to carry out a carve-out have an incentive to conduct the transaction when such financing
is cheap, exploiting a window of opportunity. Additionally, following a spin-off, the
parent company completely loses its influence on the subsidiary, whereas parent compa-
nies following carve-out transactions retain a controlling interest in the subsidiary com-
panies. This exasperates potential conflict of interests, complicates decision-making and
reduces the strategic flexibility. A new shareholder base in the subsidiary firm results

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cluded in the S&P 500) tend to benefit from speculative trading and outperform the index by 2.4%, on av-
erage, during the four business days prior to inclusion in the index.

[85] The underlying of the warrant "ALUVO" before the spin-off was 1 ALUN with a strike of CHF 1750. This
was adapted due to the spin-off to 1 ALUN + 1 LONN with a strike of CHF 1761.00. For more details, see
SWX (1999).

from carve-outs, whereas initially there are the same shareholders in spun-off compa-
nies. In terms of typical trajectory, carve-outs often are an intermediate step, leading to
consequent transactions, while the subsidiary companies resulting from spin-offs are on
a stable basis as independent companies.

3   Models and Empirical Studies on Spin-offs and Carve-outs

After having laid the foundation in Chapter 2, Chapter 3 gives an overview about the existing models (Section 3.1) and the empirical literature on the value creation of spin-offs and carve-outs (Section 3.2).

3.1   Models on Spin-offs and Carve-outs

The focus throughout Section 3.1 is on intuitive arguments and the key messages of models on spin-offs and carve-outs. Mathematical proofs can be found in the literature mentioned. After describing the general problems arising from principal agent settings, the implications of moral hazard (Section 3.1.1) and the ones from adverse selection (Section 3.1.2) are described as well as how one can generally dissolve them. Section 3.1.3 presents existing models on spin-offs, while in 3.1.4 the same is done on carve-outs.

Attempts to explain real world phenomena with tools developed for perfect market world conditions as outlined for example in Modigliani and Miller (1958) are not fully satisfactory as in reality, the very demanding assumptions are not fulfilled.[86] One of the key deviations is asymmetric information, meaning that not all parties involved have the same information set. In principal-agent relationships, an informed agent acts on behalf of an uninformed principal and the information of the informed party is relevant for the

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[86] The assumptions in Modigliani and Miller (1958) are: (1) frictionless capital markets meaning no transaction costs and no institutional restrictions, (2) competitive markets meaning that individuals as well as firms are price-takers, (3) all agents have the same information, (4) investors borrow or lend on same terms as firms, (4) taxes are neutral that means there is the same tax rate on all sources of income, (5) firm's financing and operating decisions are independent and (6) absence of bankruptcy risk meaning the firms can meet their debt obligations in every state of the world.

common welfare.[87] On the one hand, the specialized knowledge and know-how of the agent is an advantage for the principal. On the other hand, due to asymmetric information, there is also the risk for the principal that the agent's self-interested behavior is not in his best interest. Hence the key challenge for the principal is to define mechanisms that ensure that the agent best protects his self-interests (Salanié, 2002).

Jensen and Meckling (1976) were the first who applied the principal agent theory to capital structure and organizational problems. They analyze problems arising from the separation of ownership and management. In such principal-agent relationships agency costs arise. As stated in Jensen and Meckling (1976), one can differentiate three elements of agency costs:

- Monitoring and search costs that incur to the principal in the process of tracking and evaluating actions of the agent. Formal control systems, information collection, budget mechanisms and the establishment of incentive compensation systems are examples causing that kind of costs.

- Signaling and bonding costs are borne by the agent to ensure that his behavior is in the principal's best interest. Signaling must be costly, as good types of agents prove themselves by undertaking an action costly enough to deter mimicking by bad types (Spence, 1973). Hence signaling costs must be (at least relatively) higher for bad types than for good types. Bonding costs arise from actions to guarantee that the agent will act in favor of the principal or at least not act against the interests of the principal. For example, the agent would want to employ external auditors to certify that he has acted in the best interest of the principal.

- Residual losses are the difference between the first best and the realized solution. They arise among others in situations where rational players achieve only the second-best solution; for example in a situation where a contract that would be beneficial for both parties, cannot be closed due to the rational mistrust of the parties involved.

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[87] The Principal Agent Theory as well as the Transaction Cost Economics and the Property Rights Theory belong to the New Institutional Economics. Coase (1937) laid the foundations of the New Institutional Economics with its explicit introduction of transaction costs into economic analysis.

3.1.1   Moral Hazard

Moral hazard refers to the problem when a principal hires an agent and the effort of the agent is unobservable. The agent's output is random; it depends partially on his efforts and partially on chance. Usually if the output is low, the agent will say: "My output is only low because of chance - I actually worked hard." But the principal can merely base wages on what is observable. There is a tension here that is important in these models. The principal would like to make wages to vary with output; the more output the more wages in order to get the agent to put in more effort. However this adds uncertainty to the agent's pay-offs and in case the principal is risk neutral and the agent risk averse, this makes the wage the principal has to pay higher.[88] Jensen and Meckling (1976) applied this model in a setting with an inside manager and outside shareholders. The specific cost for outside equity is low effort of the manager, as the incentives to devote high efforts to value creating activities such as searching new profitable projects falls, the more equity-financed the firm is. The specific costs for debt is risk shifting.[89] Jensen and Meckling (1976) conclude that the optimal financing choice and hence the optimal capital structure is often a mix between equity and debt as this minimizes agency costs.

3.1.1.1   Shareholders vs. Management

The moral hazard agency theory can reveal motives for empire building such as diversification in unrelated businesses. The managers' motivations for unrelated acquisitions, for example, might be the maximization of own self-interests. Unrelated acquisitions that satisfy managerial self-interests, all else being equal, are expected to be retained more frequently than unrelated acquisitions that do not satisfy those interests (Bergh, 1997). The theory of free cash flows[90] may be another explanation why many companies have invested outside of their core business. In these models the manager controls the resources inside the firm (Jensen, 1986). As the manager gets private benefits in-

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[88] That the principal is risk neutral is justified usually by assuming that the principal faces many independent risks and thus can diversify the risks associated to the relationship with the agent. On the contrary, the agent exhibits risk-aversion as he is "small" and hence it is more difficult for him to diversify his risks (Salanié, 2002).

[89] See Section 3.1.1.2.

[90] Free cash flows are defined in Jensen (1986) as leftover cash after all NPV positive projects are financed.

creasing in free cash flows, he could misallocate resources. Aron (1988), on the other hand, shows that diversification is valuable because it diminishes the incentive problem firms face with respect to the CEO, as diversification reduces the amount of risk the manager must bear for incentive purposes. Diversification allows the principal more accurately to infer the manager's behavior.[91]

Overall, one can classify three general mechanisms to prevent moral hazard: Incentive mechanisms, control mechanisms and mechanisms that improve the information of the principal.

Incentive Mechanisms

The idea of incentive mechanisms is to align shareholders and managers interest and in that way ensure that the manager acts in the best interest of the shareholders. The most well known example is to link the salary of the manager to the performance of the company for instance by using Employee Stock Ownership Plans (ESOP). Employee ownership potentially can align the interests of owners and workers in much the same way that stock options give managers a greater stake in the firm's performance.[92] A potential trap in diversified companies is to link compensation of the manager of a small division to the performance of the whole group. This is not a strong incentive for him as the outcome is heavily dependent on factors not in his hands (Aron, 1991). Another way to ensure a proper use of the company's resources such as free cash flows in the Jensen (1986) framework, is an incentive optimal capital structure. Abuse of free cash flows can be prevented with a mix of short-term and long-term debt.[93] Jensen (1993) further

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[91] In the Aron (1988) model there is, for a given firm size, a trade-off between increasing diversification of the firm, thereby reducing agency costs, and increasing the size of each product line, thereby reducing production costs. In equilibrium, optimal firm size, product line size, and diversification are positively related.

[92] As described in Pugh, Jahera, and Oswald (1999), the view that ESOPs provide benefits to both shareholders and employees has been challenged because ESOPs can serve to disrupt the market for corporate control by making a takeover more costly and difficult. Thus, rather than serving to align the interests, ESOPs may do existing shareholders more harm than good.

[93] As stated in Jensen (1986) short-term debt is a measure to reduce that kind of agency conflict as short-term debt reduces the resources under control by the manager by pumping them out of the firm. An optimal level of short-term debt gives investors control over free cash flows and the manager controls the remaining funds, which are required to finance NPV positive projects. In the model of Hart and Moore (1995) the manager controls the company's access to outside financing. He might raise excessive funds for empire

claims that an adaptation of the organizational form can also be an optimal response to agency problems.

Control Mechanisms

Key control mechanisms are monitoring by shareholders or by stock market institutions and the market for managers. Monitoring systems are defined as systems that make it possible for the firm's principal to gather and analyze information about the firm and hence about the manager (Myers, 2003). Basic assumption of many monitoring models such as the one of Grossmann and Hart (1980) is that there is one manager, dispersed shareholders and a weak board of directors. This setting empirically mainly applies to the USA. As monitoring is a public good the problem of free riding arises.[94] Ways to mitigate the free riding problem of monitoring are shareholder blocks.[95] According to Burkart and Panunzi (2000), shareholder blocks and better legal protection are substitutes. In the model of Burkart, Panunzi, and Shleifer (2003), monitoring is more expensive than legal protection. Hence, based on the high legal protection in the USA, shareholders are mainly dispersed, whereas in Europe due to the lower legal protection, blockholders monitor the management. In Asia, where legal protection is even lower, family firms, which do not separate management and ownership, are in this model often better off. Apart from the direct costs resulting from monitoring, there might also be the cost associated from excessive monitoring by shifting management initiative. According to Burkart, Gromb, and Panunzi (1997), an ex-ante monitoring expropriation threat can reduce management's efforts. In their model, limited ownership concentration can be seen as a commitment of shareholders to management to minimal intervention.

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building. Long-term debt thus reduces firm's access to outside financing by using up the firms' debt capacity.

[94] See Grossmann and Hart (1980) on the free rider problem, Grossman and Hart (1988) on the best security voting structure and Burkart, Gromb and Panunzi (1997) on endogenous private benefits.

[95] The advantage of blockholders is that they enjoy control and hence mitigate the free rider problem. On the other hand they may use this control for their own goals and private benefits, which may result finally in a conflict between blockholders and dispersed shareholders. For more details on implications of blockholders see Bebchuk (1994), and Burkart, Gromb, and Panunzi (1997).

A benefit of being publicly quoted is the managerial disciplining provided by the stock market.[96] Literature dating back to Manne (1965) explores the idea that the threat of takeovers imposes discipline on managers and hence reduces agency costs from separation of ownership and control. In cases where managers pursue their own goals at the expense of profit maximization, the share price of the firm falls. This invites takeovers and subsequent replacement of the management.[97] Takeover threats therefore discipline managers' ex-ante, as they know they will be promptly replaced if the company they are running is underperforming.[98] Hence while managers may indeed hold considerable autonomy over day-to-day operations of the firm, the stock market places limits on their behavior. There are other mechanisms to limit managers' discretionary activities, such as the market for managers (Fama, 1980). Managers of firms in competitive product markets who do a poor job of generating profits will face a greater probability of failure. The fear of unemployment and bad reputation may hence provide managerial incentives.

Information Improving Mechanisms

A third possibility apart from incentivation and control to discipline the management is to improve information mechanisms between principal and agent. If the principal is better informed about the situation and the efforts of the agent, the agent would have incentives to work more in favor of the principal. Improved information e.g., through corporate disclosure rules is often a prerequisite for efficient control mechanisms.[99]

3.1.1.2   Shareholders vs. Debtholders

Jensen and Meckling (1976) were the first to show that risk shifting is an additional element of the costs of debt. Due to the limited liability of managers that are also partial owners, though they do not internalize losses in low states. That means leverage gives incentives to engage in activities that promise high pay-offs if they are successful, even

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[96] See e.g., Holmström and Tirole (1993) on the benefits of stock market monitoring.

[97] See e.g., Becht, Bolton, and Röell (2003) for a good overview on takeover models.

[98] However, according to Boot (1992) the takeover threat is only credible for manager of companies with assets that are neither too firm specific nor too marketable.

[99] Becht, Bolton, and Röell (2003) argue that information-improving mechanisms are one of the reasons justifying regulations i.e., governance rules.

if they have a low probability of success.[100] Myers (1977) points at the debt overhang problem, a problem associated with risky debt; existing risky debt can make shareholders reluctant to finance some NPV positive projects, as shareholders would incur the full costs but would receive only part of the returns. Existing debt hence acts like a tax on investments, resulting in an investment policy that is distorted towards underinvestment.

3.1.2   Adverse Selection and Signaling

Adverse selection refers to the class of problems where there are two sides to a transaction, the seller and the buyer: one side has private information relevant to the other side for example the seller knows the quality of the good, but the buyer does not.[101] Often the uninformed side cannot distinguish between good and bad types. As a consequence the terms of the transaction must be the same for all types of the informed side ("pooling equilibrium"). These terms reflect the average of those types of the informed side that chose to transact. If the informed side has a good type, he may decide not to transact because he is being averaged in with bad types, so the uninformed side can end up transacting only with the bad types of the informed side (Akerlof, 1970).

Financing under asymmetric information means that there is an information asymmetry between informed firm's current shareholders and management and uninformed new investors. Due to this, outside financing involves costs and there is the risk of misallocation of funds.[102] According to the pecking order theory of Myers and Majluf (1984), good firms prefer to issue securities whose value is least information sensitive, because

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[100] Jensen and Meckling (1976) make an analogy for highly leveraged firms:"the way one would play poker on money borrowed at a fixed interest rate with one's own liability limited to some very small stake."

[101] The classical paper regarding adverse selection is from Akerlof (1970), which describes the problem based on the market for used cars.

[102] This can be best explained based on an example of two projects; a good and a bad one, leading to overinvesting or credit rationing: Although the bad project's value is negative, overinvestment means that both projects are financed as the average value of the two projects is positive. Credit rationing means that neither type of project is financed. This can result if the average value is negative, even though the good project's value can be positive.

they are the least underpriced.[103] Consequently, securities may be ranked according to their information sensitivity.[104]

To prevent or overcome credit rationing signaling and monitoring get used. Leland and Pyle (1977) show that entrepreneurs' risk bearing, by retaining a large equity stake, can be used for signaling its kind: Retaining a large equity stake is costly due to the underdiversification, but it is more costly for bad entrepreneurs than for good ones due to the higher downside risk bad entrepreneurs face. Hence, good entrepreneurs prefer to retain their claims and be exposed to risk rather than selling underpriced claims. Investors with rational expectations anticipate this and therefore are able to differentiate between good and bad entrepreneurs. According to Ross (1977), a manager can signal its kind also by the level of debt as financial distress yields costs for managers. For a given level of debt, better firms are less likely to enter financial distress. Debt is hence less costly for managers of better firms and managers of that kind of firm can use high levels of debt to signal the superiority.

Boot (1992) provides an interesting explanation regarding the signaling implications of divestitures. He argues that managers are reluctant to divest losing business units since that would be viewed as an admission that an inappropriate project choice was initially made.[105] Such an admission might adversely affect the perception of the manager's ability and reputation. Asymmetric information allows them to hide this from outside investors; outside investors may not be aware of a manager's record of poor performance as they can only observe the performance on a firm level. Based on this, Cho and Cohen (1997) suggest that managers have incentives to hang on to losers as long as they can report adequate level of overall firm performance. However, if the performance of the

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[103] Shyam-Sunder and Myers (1999) document that empirically the pecking order model has much better explanatory power than the theory based on the trade-off between taxes, bankruptcy costs and agency conflicts. See Myers (2003) for a good overview on the alternative theories on capital structure. Drobetz and Fix on the other hand based on their sample of Swiss firms document that "the race between the trade-off theory and the pecking order theory is undecided; in fact, on many issues there is no conflict."

[104] Internal funds are least information-sensitive, and then come risk-free debt, risky debt, hybrid instruments and finally outside equity, which is most information-sensitive.

[105] Stein (1989) takes another perspective on divestitures, stating that managers are overly-concerned about short-term performance, often divesting more businesses than would be optimal for shareholders, as divestitures boost current cash flows. With present disclosure requirements and accounting standards, Stein's model is in my opinion for spin-offs and carve-outs inappropriate.

rest of the firm is not good enough to hide losers anymore, then it is no longer possible to distort information.

3.1.3   Spin-offs

Habib, Johnsen, and Naik (1997), Aron (1991), John (1993), and Chemmanur and Yan (2000) are the four most prominent models showing that a decline in information asymmetry explains the value creation in spin-offs. Galai and Masulis (1976) and Amihud and Lev (1981) conversely argue that the additional value for shareholders of spin-off firms is not created but transferred from debtholders.

Figure 4: Models on Spin-offs and Carve-outs

	Explanation	Source	Rationale
Spin-offs	**Information Asymmetry Reduction:** Value Increase	• Habib, Johnsen, and Naik (1997) • Aron (1991) • John (1993) • Chemmanur and Yan (2000)	• Spin-offs transfer information from informed to uninformed investors leading to a more informative price system • Due to spin-offs stock prices provide a cleaner signal of managerial productivity improving managerial incentives • Spin-offs reduce agency costs of underinvestment and increase the tax shield • Spin-offs increase the probability of a takeover by more capable rivals
	Assets Substitution: Value transfer from bond- to shareholders	• Galai and Masulis (1976) • Amihud and Lev (1981)	• Spin-offs increase risks for bondholders by transferring collateral into the subsidiary • Spin-offs increase risks as the coinsurance effect of imperfectly correlated cash flows is reduced
Carve-outs	**Information Asymmetry Reduction:** Value Increase	• Nanda (1991) and Nanda and Narayanan (1999) • Zuta (1999)	• Signaling of parent and subsidiary value by choice of financing method, upward revision of parent value caused by carve-out announcement • Carve-outs lead to increased transparency of managers' actions and better managerial incentivation
	Timing	• Zingales (1995)	• Owner maximizes proceeds by first carving out a minority before selling the remaining stake. • Carve-outs are more frequent during stock market booms as when the stock market level is high, private benefits are relatively less important

3.1.3.1   Information Asymmetry Reduction

Habib, Johnsen and Naik (1997) focus on information transmission among investors, especially from informed to uninformed investors. Their explanation is based on the assumption that there are investors who are better informed about the firm than the man-

agement. In this setting a company can increase its value by spinning-off a subsidiary. This will lead to an increase in the number of securities that are traded on the market. This makes the price system more informative and hence leads to a decrease of information asymmetry. The improved information quality improves the quality of managers' investment decisions and reduces uninformed investors' uncertainty about asset values.

Aron (1991) argues that the value creation of spin-offs comes from the fact that after the transaction, traded securities provide a cleaner signal of managerial productivity than when the two divisions were part of a combined firm. A problem of the combined firm is that the share price is not only dependent on the efforts of the specific manager, but also on the efforts of managers of other divisions and on the external environment, on which the manager has no influence. If the manager is risk-averse, as it is assumed in most models, it requires a compensation for that risk. Aron (1991) argues that the possibility of a spin-off in the future is already enough to improve current incentives for divisional managers, even if spin-offs rarely occur. The possibility of a future spin-off induces the divisional manager to act as if he was being monitored and evaluated by the capital market, even though the capital market's evaluation is observed only if a spin-off actually occurs.[106] Woo, Willard, and Daellenbach (1992) support Aron (1991) as they state that spin-offs reduce monitoring as well as bonding costs. They argue that thanks to the separation the companies' share prices provide much cleaner signals about management's performance and hence reduce the cost of information collection by the principal. They also declare that bonding costs are reduced and due to the separation, the incentives between managers and shareholders are more aligned.

John (1993) models an agency relationship between debtholders and corporate insiders, which control investment decisions privately, acting in the interests of the shareholders. In this model optimal leverage is the equilibrium of the trade-off between agency costs particularly underinvestment resulting from outstanding risky debt and the benefits of debt that means the tax shield of debt. In this setting, assuming that cash flows of the parent and the subsidiary company are positively but not perfectly correlated, spin-offs

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[106] It is somehow puzzling that Aron argues in her 1988 paper (see 3.1.1.1) that diversification diminishes the incentive problem; while in her 1991 paper she argues that spin-offs improve agency problems. She picks up this point in her 1991 paper and stresses that diversification (as documented in the 1988 paper) diminishes the incentive problems for the CEO while (as laid down in the 1991 paper), diversification exacerbates difficulties to incentivate divisional managers.

increase the firm value by reducing agency costs and in the same time increase the tax shield.[107]

However, there are also models providing a rationale as to why public ownership restructuring transactions may increase information asymmetry. According to the models of Gorton and Pennacchi (1993) and Subrahmanyam (1991), bundling of claims on individual assets into composite claims reduces informed traders' informational advantage. As spin-offs and carve-outs decompose claims on the underlying assets, these theories predict that the informational advantage of the informed parties will increase following such transactions. Another argument is based on the assumption that public information complements traders' private information as outlined in Lundholm (1988). As public ownership restructuring transactions require a more detailed disclosure, this would mean that informed investors could combine their private information with better public information to gain an even greater advantage.

Chemmanur and Yan (2000) develop another rationale for the value improvements of firms following spin-offs. They consider a firm with multiple divisions, where incumbent management may have differing abilities for managing various units. Giving up control to a rival with better ability in managing the firm, increases the firm's equity market value, but also involves that the incumbent loses his private benefits of control. Due to this trade-off, the incumbent is only willing to relinquish control to high ability rivals and not to rivals who have only moderately higher management ability. In this setting a spin-off increases the probability of a loss of control to a potential rival as firm size gets smaller and the probability that passive investors will vote with the rival in a contest for control increases. This enhanced takeover threat after a spin-off motivates the incumbent manager to work harder in order to prevent takeovers. The model of Chemmanur and Yan (2000) is especially interesting as it has implications that are also empirically supported for example that focus improving spin-offs have a bigger announcement effect and positive long-term abnormal returns. They differentiate between implications for the likelihood of spin-offs, implications for the stock market reaction to

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[107] A second implication of this model concerns the allocation of debt. Assuming that the parent company is optimally financed, the more profitable firm should be assigned more debt than the less profitable firm.

spin-off announcements and implications for the long-term firm performance following spin-offs.[108]

3.1.3.2 Asset Substitution

Amihud and Lev (1981) argue that managers engage in corporate diversification to reduce their human capital risk, even if it reduces shareholder value. The presumption is that corporate diversification lowers firm risk. In a contingent claims framework[109], lowering firm risk lowers shareholder value and increases bondholder value, as a reduction in firm risk suggests a lower default risk. In this context, a shareholder value increase due to spin-offs does not indicate an increase in firm value but rather represents the risk effects of imperfectly correlated cash flows of parent and subsidiary company. Galai and Masulis (1976) use a similar argument to show that spin-offs imply a potential wealth shift from debtholders to shareholders by transferring some of the bondholders' collateral into the spun-off subsidiary company.

So there are two potential sources of wealth transfer from bondholders to shareholders. First, spin-offs may result in loss of collateral and liquidation value because assets have been reassigned to the subsidiary company and secondly, bondholders can suffer a loss due to increased risk by the elimination of coinsurance provided by not perfectly positively correlated cash flows.[110] However, broad empirical work supports that parent

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[108] Spin-offs are more likely (1) if a firm operates in an industry with a high degree of takeover activity, (2) for divisions that underperform, (3) for firms that are unrelated to the core business, and (4) for firms operating in industries characterized by rapid technological change. The magnitude of the announcement effect is increasing (1) in the size of the subsidiary as a percentage of the combined firm, (2) in the extent of takeover activity in the parent firms' industry, and (3) in the case of unrelated spin-offs (focus increasing) compared to related spin-offs. The long-term positive abnormal returns will be higher if (1) the incumbent management's equity holding in the subsidiary is small, (2) one of the two firms resulting from the spin-off is taken over subsequently, and (3) in unrelated spin-offs (focus increasing) compared to related spin-offs.

[109] A contingent claims framework suggests that shareholders' equity is a call option on the value of the firm exercised in states where the value of the assets is greater than the value of the debt claim. See e.g., Copeland, Koller, and Murrin (1996).

[110] See Maxwell and Rao (2002) for a good overview on the asset substitution literature.

company's bondholders are unaffected by spin-off or carve-out announcements.[111] On the other hand, a recent study by Maxwell and Rao (2003), on a large sample of spin-offs, finds evidence that bondholders on average suffer from a significantly negative abnormal return in the month of the spin-off announcement.[112] But Maxwell and Rao (2003) state as well that the wealth expropriation hypothesis is not a complete explanation of the stockholder gains.

3.1.4   Carve-outs

Nanda (1991), Nanda and Narayanan (1999), and Zuta (1999) are the key models in describing the implications of carve-outs based on the reduced information asymmetries induced by carve-outs. Zingales (1995) shows how timing issues might influence the choice of divestiture method.

3.1.4.1   Information Asymmetry Reduction

In Nanda (1991), asymmetric information between new and incumbent shareholders sets the stage for the adverse selection problem addressed by Myers and Majluf (1984). In his model, firms can choose to finance projects by selling equity of the parent company in a SEO, by carving-out part of a subsidiary, or simply forgo the project. By their financing decisions, firms reveal not only information about the subsidiary company but also information about the parent company. Managers have an informational advantage over outside investors, in knowing that the stock of the parent company is undervalued, whereas market participants overvalue the subsidiary company. A separating equilibrium exists, where parents issue shares of the subsidiary company. This constitutes a signal for the value of both entities, in particular for an upward revision of the parent's value resulting in a positive announcement effect. Hence Nanda (1991) shows that

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[111] Schipper and Smith (1983), Hite and Owers (1983), Miles and Rosenfeld (1983), Allen and McConnell (1998), Dittmar (1999) and Veld-Merkoulova (2002).

[112] Mansi and Reeb (2002) support the hypothesis that while diversification reduces shareholder value, it enhances bondholder value due to a reduction in firm risk. Another study that documents such a wealth transfer is Parrino (1997). In the case study of the Marriott spin-off, he shows that the restructuring not only reduced the collateral on Marriott's existing debt, but also reduced the bondholder claims on cash flows from the business.

through equity carve-outs, the company can overcome the Myers and Majluf (1984) underinvestment problem.

Nanda and Narayanan's (1999) argument is based on the assumption that information is transmitted from firm managers to outside investors. As in the model of Aron (1991) for spin-offs, they assume that the market can observe aggregate firm cash flows but not individual cash flows of the parent and the subsidiary company separately. In their model the cost of financing a project by divesting a division is greater that the cost of external equity financing which in turn is costlier than internal capital. They show that if an undervalued firm needs external capital it may resort to costly divestiture while an overvalued firm will use less costly external equity, resulting in a correct valuation of the divisions. So managers base their decisions about fund raising methods on their perception of the valuation, thus revealing private information to the market.

Zuta (1999) develops an agency model in which the manager of a diversified two-division firm derives different private benefits from each of the divisions, which leads to an inefficient allocation of resources within a firm. He argues that issuing tracking stocks mitigates but does not eliminate these agency problems in two ways: through increased transparency of manager's actions, due to the new information that becomes available after the restructuring, and through a closer fit between the manager's compensation and the performance of both parts of the company.[113]

3.1.4.2 Timing and Window of Opportunity

In 2000, Baker and Wurgler empirically showed that managers seem to have stock market timing capabilities, as firms issue relatively more equity just before periods of low stock market returns. Two years later, the same authors derived a dynamic pecking order theory, meaning that firms adapt the normal pecking order theory of Myers and Majluf (1984), depending on the variation in the relative cost of debt and equity. Graham and Harvey (2001) based on the findings in their CFO survey support this view. They document that CFOs put importance on their perception of under-/overvaluation and past stock market performance. Thus by going public, firms may, apart from filling true fi-

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[113] The empirical finding of Zuta (1999) support his model as he finds a decline in the diversification discount after the introduction of tracking stocks.

nancing or divestment needs, also try to capitalize on optimistic perceptions in the market.[114]

Zingales (1995) shows how an initial owner can maximize proceeds of selling his company.[115] He states that dispersed shareholders are tough bargainers for cash flow benefits, while controlling blockholders are tough bargainers for private benefits. Hence the incumbent can use dispersed shareholders strategically to maximize external security benefits by first carving out a minority before selling the remaining stake to a controlling blockholder such as a strategic buyer. Zingales (1995) also provides a framework to analyze the choice among different divestiture strategies: Direct sell-offs are preferable when the potential buyer is likely to reduce the value of cash flow rights. Spin-offs are attractive when the potential buyer's private benefits of control such as synergies are very low. According to his model, in all other cases, a two-stage sale (such as a carve-out followed by a sell-off or a spin-off) should be chosen to maximize proceeds. The Zingales (1995) model is also able to explain why IPOs such as carve-outs are more frequent during stock market booms and going private transactions are more frequent during stock market downturns. This is based on the argument that the difference between the cash flow rights for the buyer and the incumbent should be positive and bigger than the difference in private benefits. Zingales (1995) argues that when the stock market level is high, private benefits are relatively less important. Hence the model predicts that IPO activity increases during stock market booms.

3.2   Empirical Studies on Spin-offs and Carve-outs

Section 3.2 gives an overview on existing research on the announcement effect including the initial day of trading effect, the long-term value creation effect including the evidence on managerial timing and the impact on the operating performance and on price multiples of firms conducting spin-offs and carve-outs. Figure 5 shows how broadly the

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[114] For IPOs this is documented in Ritter (1991), who states that investors are periodically too optimistic about the earnings potential of young growth companies, and that firms take advantage of this windows of opportunity.

[115] Stoughton and Zechner (1998) and Mello and Parsons (1998) also study the relationship between ownership structure and the process of going public.

value creation of US and European spin-offs and carve-outs has been analyzed so far differentiated by the four different types of empirical tests. Most research to date is available on the announcement effect and on the long-term stock market performance. There is only limited research on price multiples and operating performance. Not surprisingly US transactions are much better investigated than European transactions. The value creation effects of spin-offs on both continents are better documented than the effects of carve-outs. Especially European carve-outs are hardly analyzed in a broad empirical study to date.

Figure 5: Overview on Existing Empirical Studies

Existing empirical studies
- ■ Broadly investigated
- ▨ Partially investigated
- □ Not/very limited investigated

Transaction types	Announcement 3.2.1	Long-term Stock Market 3.2.2	Price Multiples 3.2.3	Operating Performance 3.2.4
Spin-offs				
EU spin-offs	▨	▨	□	□
US spin-offs	■	■	□	▨
Carve-outs				
EU carve-outs	□	□	□	□
US carve-outs	■	■	□	▨

3.2.1 Announcement Effect

Following the shareholder value approach as described in Rappaport (1986), an increase in shareholder value for a listed company can be measured by the increase in market capitalization or more specifically by the total return to shareholders. According to Lamont and Thaler (2001), two key principles of the efficient market hypothesis are that first it is not easy to earn excess returns and second that prices are correct in the sense

that they reflect fundamental values.[116] If the market is efficient at least in its semi-strong form as defined in Fama (1970), stock market prices should incorporate new information such as a spin-off or a carve-out, which is relevant for the valuation quickly and correctly.[117] As noted by Fama (1991), event studies on narrow windows around the announcement date have many methodological benefits.[118] In particular, the standard event-study procedure attenuates the joint-hypothesis problem, as the results from narrow windows are much less sensitive to a particular asset-pricing model (Mitchell and Stafford, 2000). Positive stock market effects at the days of the announcement are in line with the semi-strong form of the Efficient Market Hypothesis (EMH), meaning that public information is rapidly incorporated into securities prices. However, if stock markets are efficient, no additional long-term abnormal stock market performance should be observable.

3.2.1.1   Spin-offs

Previous research uniformly documents economically and partially statistically significant positive abnormal returns for parent firms upon the announcement of spin-offs (Table 2). For US spin-offs, this effect to the extent of around 2% to 4% has been broadly investigated and tested. Miles and Rosenfeld (1983) was the first empirical paper on this subject analyzing the announcement effect of 55 spin-offs between 1963 and 1980. They found an announcement effect in the two days event window of 3.3%. Schipper and Smith (1983) and Hite and Owers (1983) confirmed this result for transactions in the years 1963 to 1981. The effect maintained at a similar level in the 1980s and in the 1990s.

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[116] Lamont and Thaler (2001) show that equity carve-outs in US technology stocks during the "tech boom" at the end of the 1990s even violated a basic premise of financial theory: The law of one price that the same assets cannot trade simultaneously at different prices.

[117] According to Fama (1991) the stock market overall is semi-strong efficient; event studies on many topics provide evidence that the market incorporates new information quickly and, for the most part, correctly. This is supported by Miller and Reilly (1987), which find that price adjustments due to IPO underpricing take place within one day after the offering.

[118] Event studies are used to measure the impact of an economic event on firm value. Assuming that the event will be reflected in traded asset prices, these studies focus on how asset prices respond to information released during a public announcement of the event. Ball and Brown (1968), and Fama et al. (1969) pioneered the classic event study methodology.

Table 2: Announcement: Literature on US Spin-offs

Source	Timeframe	Sample size	Event window (in days)	Announcement effect Mean (median)	Event window (in days)	Announcement effect Mean (median)
Miles and Rosenfeld (1983)	1963 – 1980	55	t to t+1	3.3%	t-5 to t+5	7.3%
Schipper and Smith (1983)	1963 – 1981	93	t-1 to t	2.8%	t-5 to t+5	3.5%
Hite and Owers (1983)	1963 – 1981	123	t-1 to t	3.3%		
Copeland, Lemgruber, and Mayers (1987)	1962 – 1983			3.0% (2.5%)		
Vijh (1994)	1964 – 1990	113	t-1 to t	2.9% (2.1%)		
Allen et al. (1995)	1962 – 1991	94	t-1 to t	2.2%	t-4 to t+4	2.5%
Michaely and Shaw (1995)	1981 – 1988	9	t-2 to t+2	4.5%		
Daley, Mehrotra, and Sivakumar (1997)	1975 – 1991	85	t-1 to t	3.4%		
Desai and Jain (1999)	1975 – 1991	155	t-1 to t+1	3.8% (1.4%)		
Krishnaswami and Subramaniam (1999)	1979 – 1993	118	t-1 to t	3.2% (1.9%)	t-5 to t+5	0.1% (-0.1%)
Gertner, Powers, and Scharfstein (2000)	1981 – 1996	160	t-1 to t+1	3.9% (2.2%)		
Blanton, Perrett, and Taino (2000)	1997 – 2000	68	t-2 to t+1	3.6%		
Mulherin and Boone (2000)	1990 – 1998	106	t-1 to t+1	4.5% (3.6%)		
Chemmanur and Paeglis (2000)	1991 – 1998	19	t	2.2% (2.3%)	t-5 to t+5	2.7% (1.3%)

t denotes the announcement date.

Table 3: Announcement: Literature on European Spin-offs and Carve-outs

Source	Country	Timeframe	Sample size	Announcement window (in days)	Announcement effect Mean (median)	Announcement window (in days)	Announcement effect Mean (median)
Spin-offs							
Bühner (1998)*	USA and EU	1993 – 1997	24	t	0.7%		
Bühler (2000)	EU	1989 – 1999	42	t-1 to t+1	2.6%	t-30 to t+20	3.6%
Janssens de Vroom and Van Frederikslust (2000)	EU (excl. UK)	1990 – 1998	34	t-1 to t+1	0.5%		
Veld and Veld-Merkoulova (2004)	EU	1987 – 2000	156	t-1 to t+1	2.6% (0.9%)	t+1 to t+10	-0.3% (-0.0%)
Kirchmaier (2003)	EU	1989 – 1999	48	t to t+1	4.1% (2.0%)	t-10 to t+10	5.6%
Carve-outs							
Ahlers (1997)	Germany	1984 – 1996	23			t-10 to t+10	-1.0%
Bühner (1998)*	USA and EU	1993 – 1997	10	t	-0.2%		
Gibbs (2000)	EU	1999 – 2000	47	t-1 to t+1	2.5%	t-30 to t+30	2.9%
Elsas and Löffler (2001)	Germany	1984 – 2000	39	T	1.1% (0.5%)	t-10 to t+10	4.1% (5.0%)
Langenbach (2001)	Germany	1984 – 1999	32	t-1 to t	1.4%	t-5 to t+5	3.1%

* Bühner analyses 34 transactions whereof he classifies 17 as spin-offs (0.7%) and 10 as carve-outs (-0.2%); t denotes the announcement date; for initial day of listing effects for German carve-outs see Pellens (1993), Kaserer and Ahlers (2000), Mathesius (2003) and Fucks (2003). t denotes the announcement date.

For European transactions, the announcement effect seems to be similar, although there is limited evidence due to the lower number of transactions and the fewer research studies (Table 3). Veld and Veld-Merkoulova (2004) used the broadest sample of European spin-offs to date. Based on a sample of 156 European spin-offs in the period from January 1987 to September 2000, they document a cumulative average abnormal return over the three-day event window of 2.6%, which is in line with previous US studies. They find that the announcement effect is stronger, the longer the event window. That means that part of the information processing already takes place before and also subsequent to the announcement of the transaction.

3.2.1.2   Carve-outs

Equity carve-outs, where the parent firm sells a portion of its ownership in a subsidiary via the stock market, are unique because they combine characteristics of both restructuring and financing. Whereas there are positive value effects of firms announcing restructuring transactions such as spin-offs or asset sell-offs, there are negative value effects of firms announcing financing transactions such as seasoned equity offerings.[119] As it is not clear whether carve-outs (such as pure restructuring transactions) are perceived by market participants as motivated by the desire to increase efficiency or by the desire to generate cash by selling overvalued securities (such as in financing transactions), it its especially interesting to analyze the announcement effect of carve-outs.

Studies on the United States support the restructuring characteristics for carve-outs as they document abnormal returns of approximately 2% for parent companies in the days surrounding the announcement of a subsidiary carve-out (Table 4). Schipper and Smith (1986) were the first to examine this effect. Based on a sample of 76 carve-outs between 1965 and 1983, they find that carve-out announcements are associated with mean abnormal returns of 1.6% over the eleven-days event window. These findings are supported by many other studies.[120]

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[119] See Hite and Owers (1983); Alexander, Benson, and Kampmeyer (1984); Jain (1985); and Hite, Owers, and Rogers (1987). For the announcement effect of SEOs see for example Asquith and Mullins (1986); Masulis and Korwar (1986); Schipper and Smith (1986); and Corwin (2003).

[120] See for instance Allen and McConnell (1998); Chemmanur and Paeglis (2000); Mulherin and Boone (2000); Fu (2002); Hulburt, Miles and Woolridge (2002); and Vijh (2002).

Table 4: Announcement: Literature on US Carve-outs

Source	Timeframe	Sample size	Announcement window (in days)	Announcement effect Mean (median)	Announcement window (in days)	Announcement effect Mean (median)
Schipper and Smith (1986)	1965 – 1983	76	t-1 to t+1	0.74%	t-5 to t+5	1.6%
Michaely and Shaw (1995)	1981 – 1988	28	t-2 to t+2	0.4%		
Allen and McConnell (1998)	1970 – 1993	186	t-1 to t+1	1.9% (0.9%)		
Blanton, Perrett, and Taino (2000)	1997 – 2000	64	t-2 to t+1	2.6%		
Chemmanur and Paeglis (2000)	1991 – 1998	19	t	0.4%	t-5 to t+5	-1.0% (-1.5%)
Mulherin and Boone (2000)	1990 – 1998	125	t-1 to t+1	2.3% (0.8%)		
Schill and Zhou (2001)*	1998 – 2000	11	t-1 to t+1	11.3%.	t+2 to t+5	-4.0%
Haushalter and Mikkelson (2001)	1994 – 1996	31	t-1 to t+1	2.2% (1.0%)	t-2 to t+2	3.4% (2.8%)
Fu (2002)	1993 – 2001	94	t-1 to t+1	1.9% (1.5%)		
Hulburt, Miles, and Woolridge (2002)	1981 – 1994	185	t-1 to t+1	1.9% (0.8%)		
Vijh (2002)	1980 – 1997	336	t-1 to t+1	2.0%	t-5 to t+5	2.3%

* Focusing on internet stocks; t denotes the announcement date.

The announcement effect for European carve-outs has not yet been broadly tested (Table 3). Gibbs (2000) tests the effect with a sample of 47 transactions on a rather broad scale, but just for transactions taking place in 1999 and 2000. Other studies have a limited regional focus; Elsas and Löffler (2001), Ahlers (1997) and Langenbach (2001) focus on German carve-outs only, while other research is based on limited date samples such as for example Bühner (1998) with only ten transactions. Therefore based on the existing empirical studies the announcement effect of European carve-outs is vague.

3.2.1.3   Initial Day of Trading Effect

In addition to the unexpected effects upon the announcement of transactions, several authors document a value effect at the predictable execution date, which appears surprising absent of new information (Table 5). For US spin-offs Copeland, Lemgruber, and Mayers (1987) document an abnormal return of 2.2% and Vijh (1994) one of 3.0% at the execution date of the transaction. Kirchmaier (2003) confirms these findings for European spin-offs, finding an abnormal initial day of trading effect for the parent firms of 1.0% and 3.5% for subsidiary firms. According to Vijh (1994), the bid-ask-spread or any measurement error does not cause this effect. He concludes that it is rather a result of a variety of microstructure considerations that make the separated stocks more attractive than the stock of the combined firm.

Table 5: Initial Day of Trading: Literature on US Spin-offs and Carve-outs

Source	Timeframe	Sample size	Initial day of trading window (in days)	Initial day of trading effect Mean (median)	Initial day of trading window (in days)	Initial day of trading effect Mean (median)
Spin-offs						
Copeland, Lemgruber and Mayers (1987)	1961 – 1981	59		2.2%		
Cusatis, Miles, and Woolridge (1993)	1965 – 1988	146	T to T+10	-0.9%	T to T+40	-1.6%
Vijh (1994)	1964 – 1990	108	T	3.0% (2.1%)	T+1 to T+5	-1.6%
Michaely and Shaw (1995)	1981 – 1988	30	T to T+10	-3.3%	T to T+60	-9.4%
Carve-outs						
Schipper and Smith (1983)	1963 – 1981	41	T	4.9% (2.1%)		-9.4%
Michaely and Shaw (1995)	1981 – 1988	61	T to T+10	-0.5%	T to T+60	-6.2%
Vijh (1999)	1981 – 1995	628	T	6.2% (2.5%)		
Benveniste et al. (2000)	1986 – 1999	118	T	9.5% (2.8%)		-6.3%
Powers (2003)	1980 – 1996	181	T	4.8% (2.7%)		

T denotes the completion date.

There is no broad evidence for initial day of trading effects of European carve-outs as both Pellens (1993) and Kaserer and Ahlers (2000) focus on Germany and use restricted samples of 11 resp. 23 carve-outs. The initial day of trading effects for US carve-outs seems to be even bigger than the one for spin-offs. On the other hand, Ibbotson, Sindelar, and Ritter (1997) document an even higher initial day of trading return of 15.4% for an extensive sample of IPOs. For IPO there are many explanations for this abnormal return at the first day of trading for instance based on the Rock (1986) model that is based upon the existence of investors whose information is superior to that of the firm as well as that of all other investors. In this set-up the firm must price the shares at a discount in order to guarantee that the uniformed investors subscribe the issue.[121] Schipper and Smith (1983) find that for 41 carve-outs between 1963 and 1981, the initial day of trading showed a mean (median) abnormal return of 4.9% (2.1%). The 181 carve-out firms in the sample of Powers (2003) exhibit a mean (median) increase from the offering price to closing price at the first day trading of 4.8% (2.7%). Vijh (1999) documents that during the years 1981-1995, the 628 carve-out subsidiary stocks earned an average initial listing-day return of 6.2%. In their sample of 118 carve outs between 1986 and 1999, Benveniste et al. (2000) document as well an abnormal initial day of trading return. They document, however, that the returns to both the carved-out subsidiary and the

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[121] For an overview, see Ritter (2002).

parent firm on the IPO date are predictable, conditional on the return to the parent in the pre-offer period.

3.2.2   Long-term Stock Market Effects

There is a substantial and growing body of literature that goes beyond documenting positive announcement effects induced by corporate events, also analyzing the long run abnormal returns following the events.[122] Abnormal long-term performances signal that event studies that measure abnormal returns only around the announcement date do not accurately capture the total value created by these events. From a different perspective one could argue that these long-term stock market performance studies measure whether managers can deliver more or less compared to what is expected by stock market participants at the announcement date. These studies can be partially explained with the "Under-/Overreaction" hypothesis that investors tend to overreact to some events such as IPOs, but underreact to others such as dividend initiations (DeBondt and Thaler, 1985; Barberis, Shleifer, Vishny, 1998; and Kent, Hirshleifer, and Subrahmanyam, 1998).

3.2.2.1   Spin-offs

There is broad empirical evidence on the long-term value creation of US spin-off firms (Table 6). Based on the existing literature the announcement effect seems not to capture the whole average value creation of spin-offs in the USA. Pro-forma combined, parents as well as subsidiary firms create additional value depending on the methodology ap-

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[122] Such events apart from spin-offs and carve-outs include analyst recommendations (Womack, 1996); dividend announcements (Michaely, Thaler and Womack, 1995); earnings announcements (Ball and Brown, 1968; Bernard and Thomas, 1990); IPOs (Ritter, 1991; Loughran and Ritter, 1995; Brav and Gompers, 1997; Carter, Dark, and Singh, 1998; Stehle, Erhard, and Przyborowsky, 2000; and Drobetz, Kammermann, and Wälchli, 2003); M&As (Agrawal, Jaffe, and Mandelker, 1992; Anslinger and Copeland, 1996; and Rau and Vermaelen, 1998); repurchases (Ikenberry, Lakonishok, and Vermaelen, 1995); proxy contests (Ikenberry and Lakonishok, 1993); R&D increases (Eberhart, Maxwell and Siddique, 2004); SEOs (Spiess and Affleck-Graves, 1995; Lee, 1997; Carter, Dark, and Singh, 1998; Eckbo, Masulis, and Norli, 2000; Stehle, Erhard, and Przyborowsky, 2000; and Brav, Greczy, and Gompers, 2000); sell-offs (Hearth and Zaima, 1984; Alexander, Benson, and Kampmeyer, 1984; Jain, 1985; and Klein, 1986); and stock splits (Ikenberry, Rankine and Stice, 1996; and Desai and Jain, 1997).

plied to the extent of 5% to 20% in the years after the transaction. The markets require some time to incorporate the additional value created as a significant part of the value is created beyond one year after the transaction. The results of McConnell, Ozbilgin, and Wahal (2001) and Powers (2001) indicate that the additional value creation declined in the 1980s and 1990s compared to the earlier periods particularly for subsidiary firms. Based on the existing literature it is not possible to say whether parent or subsidiary firms perform better in the long run subsequent to the transaction. As there is no research on spin-offs occurring from the years 1998 onwards, one cannot judge whether this trend continued or not. This paper will further develop this idea and investigates on the long-term stock market value creation of European spin-offs firms. So far there are only two key papers on European spin-offs and their results are somehow at odds (Table 7). Based on the results of Veld and Veld-Merkoulova (2004) one doubts the long-term value creation while Kirchmaier (2003) provides weak evidence for a long-term stock market outperformance of European spin-off firms.

US spin-offs

Table 6: Long-term Stock Market Performance: Literature on US Spin-offs

Source	Timeframe	Sample size	Subject	Window (in months)	Abnormal return Mean (median)	Window (in months)	Abnormal return Mean (median)
Cusatis, Miles and Woolridge (1993 and 94)	1965 – 1990	141	Combined	T to T+12	4.7%	T to T+36	13.9%
		131	Parent	T to T+12	12.5%	T to T+36	18.1%
		146	Subsidiary	T to T+12	4.5%	T to T+36	33.6%
Michaely and Shaw (1995)	1981 – 1988	30	Subsidiary	T to T+12	-36.6%	T to T+24	-59.1%
Desai and Jain (1999)	1975 – 1991	155	Combined	T to T+12	7.7%	T to T+36	19.8%
		155	Parent	T to T+12	6.5%	T to T+36	15.2%
		155	Subsidiary	T to T+12	15.7%	T to T+36	32.3%
Anslinger, Klepper, and Subramaniam (1999)			Subsidiary			T to T+24	9.7%
Anslinger, Bonini, and Patsalos-Fox (2000)	1988 – 1996	79	Parent			T to T+24	0.7%
		79	Subsidiary			T to T+24	10.8%
McConnell, Ozbilgin, and Wahal (2001)*	1989 – 1995	96	Parent	T to T+12	13.5% (4.0%)	T to T+36	5.1% (12.0%)
		96	Subsidiary	T to T+12	7.2% (4.0%)	T to T+36	-20.9% (2.0%)
Powers (2001)	1981 – 1998	187	Parent	T to T+12	2.5%		
		187	Subsidiary	T to T+12	-6.4%		

* Results showed are average and median buy and hold abnormal returns (ABHARs and MBHARs). Average and median cumulative abnormal returns (ACARs and MCARs) are for parents for 1 year 5.7% and 4.0% and -1.8% and 6.0% for three years; for subsidiaries the respective values are 3.3% and –1.0% and 7.9% and 9.0%; T denotes the execution date.

Kudla and McInish (1983) are the first to examine the long-term stock market perform-
ance of firms following spin-offs. Their sample of six spin-offs in the 1970s is limited
and hence also the reliability of their results. They document that the stock market per-
formance of the pro-forma combined firm after the transaction is volatile; it peaks
around 24 weeks after the transaction with two-digit positive excess returns as compared
to the market model and is followed by a low 40 weeks after the transaction with almost
two-digit negative excess returns.

Cusatis, Miles, and Woolridge (1993 and 1994) are then the first to broadly test the long
run stock market performance of firms involved in spin-offs. They examine the stock
market performance before and following the transaction for 161 spin-offs occurring in
the time period 1965 to 1990. They document that in addition to the positive abnormal
returns documented at the announcement date, the spun-off subsidiaries, the parents as
well as the combined firm, experience significantly positive abnormal returns compared
to matching firms for up to three years beyond the transaction. Parents' (subsidiaries'),
mean-matched firm adjusted returns for the period one, two and three year following the
transaction are 12.5% (4.5%), 26.7% (25.0%) and 18.1% (33.6%). These abnormal
returns are associated with corporate restructuring activity as both spin-off subsidiaries
and parents are five times more likely to be taken over than other companies (Cusatis,
Miles, and Woolridge, 1994). Their findings indicate that investors have not fully an-
ticipated the increased takeover activity at the announcement and therefore underesti-
mate the value created by spin-offs.

Michaely and Shaw (1995) focus on master limited partnerships (MLPs)[123], whereof 30
were created through a spin-off, between 1981 and 1988 on US stock exchanges. They
document for this specific sample a strong underperformance of the subsidiary firm:
The excess returns compared to the CRSP value-weighted return is -36.6% in the first
year after the transaction and -59.13% in the first two years after the transaction.

Based on their sample 155 spin-offs between the years 1975 and 1991, Desai and Jain
(1999) are the first to document that not only the announcement effect for focus increas-

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[123] MLPs were chosen to suppress the effects of taxes and control issues. Sponsoring parents of MLPs only
need to be the general partner of an MLP to maintain control over the MLP's activities. It is not required
to own any of the publicly traded securities. MLPs are not recognized as a corporation, therefore they
cannot be consolidated in either the corporate financial statement or tax returns. Hence the primary incen-
tive to own share in the new firm is due to the fact that the parent company believes they are a good in-
vestment.

ing spin-offs is bigger, but also that firms involved in focus increasing spin-offs perform better on the stock market in the long run. In particular, abnormal returns based on size and industry matched firms for focus increasing (non-focus increasing) pro-forma combined firms are statistically significant (insignificant) 11.1% (-1.0%), 20.8% (-7.7%) and 33.4% (-14.3%) over holding periods of one, two and three years following the transaction. Examining the performance of parent and subsidiary firms separately show similar results. Contrary to the results of Cusatis, Miles and Woolridge (1993 and 1994), firms that were taken over after the transaction do not drive the outperformance. Desai and Jain's (1999) results are robust with alternative definitions of focus and to alternative benchmarks.

Anslinger, Klepper and Subramaniam (1999) document a mean annual buy and hold excess return in the two years after the transaction compared to the Russell 2000 index of 12.8% and compared to the S&P 500 of 9.7%. They emphasize that large-cap spin-offs lag the market and that spin-offs with a market capitalization of less than one billion USD account for the outperformance. Anslinger, Bonini and Patsalos-Fox (2000) attest that in the two years after the transaction spin-off parent companies outperform the S&P 500 by 0.7%, while their spun-off subsidiaries outperform the Russell 2000 by 10.8%. These results are based on a sample of 79 spin-offs occurring between 1988 and 1996 in the USA.

McConnell, Ozbilgin, and Wahal (2001) investigate based on a sample of 96 spin-offs in the period 1989 to 1995 whether a trading strategy based on Cusatis, Miles, and Woolridge (1993) would have earned excess returns on an ex-ante basis. They adopt the perspective of an investor who has access to the Cusatis, Miles, and Woolridge (1993) study and wanted to make money by following a respective strategy. Results are sensitive to the benchmark employed: When compared with the matched firm benchmark used by Cusatis, Miles, and Woolridge (1994) and the Fama and French (1993) 3-factor model, the strategy does not outperform. Comparing it with size and book-to-market matched portfolios the strategy beats the benchmark. Additionally, the results in the 1989 to 1995 period are sensitive to the holding period. For example, if the investor had elected to buy at the ex-date and hold these shares for 36 months, the average excess return would have been 5.1% for parents and -20.9% for subsidiaries. In comparison, if the investor had held for 24 months, the average excess return would have been 19.2% for parents and 5.8% for subsidiaries. McConnell, Ozbilgin, and Wahal (2001) notice that the long-run outperformance of spin-offs can mainly be attributed to a few outliers that perform extremely well. They also reject the hypothesis that the excess returns of

companies involved in takeover activity drive the outperformance as indicated by Cu-satis, Miles, and Woolridge (1993).

Based on Powers' (2001) sample of 187 spin-offs occurring between 1981 and 1998, spin-off parents outperform their industry benchmark in the year after the transaction by 4.9% and the value weighted index by 2.5%. The spun-off subsidiaries, on the other hand, underperform their industry benchmark in the year after the transaction by -0.9% and the value weighted index by -6.4%.

European Spin-offs

Table 7: Long-term Stock Market Performance: Literature on European Spin-offs

Source	Timeframe	Sample size	Subject	Window (in months)	Abnormal return Mean (median)	Window (in months)	Abnormal return Mean (median)
Kirchmaier (2003)	1989 – 1999	34	Combined			T to T+36	4.2% (12.0%)
		34	Parent			T to T+36	-5.9% (7.0%)
		41	Subsidiary			T to T+36	17.3% (18.6%)
Veld and Veld-Merkoulova (2004)	1987 – 2000	61	Combined	T to T+12	-2.3%	T to T+36	2.0%*
		105	Parent	T to T+12	-0.7%	T to T+36	-0.4%*
		70	Subsidiary	T to T+12	12.6%	T to T+36	15.2%*

T denotes the execution date; *: Annualized abnormal return

Kirchmaier (2003) is the first paper investigating on the long-term stock market per-formance of European spin-offs (Table 7). His sample consists of 48 European spin-offs occurring between 1989 and 1999. In the long run, it appears that the pro-forma com-bined firms on average (median) statistically insignificantly outperform the overall mar-ket by about 4.2% (12.0%) in the three years after the transaction. Size measured by the market capitalization at the announcement and execution date seems to be a key driver of these results as large firms underperform the market on average (median) by –20.0% (-7.2%), while small spin-offs outperform the market by 26.0% (17.5%). On average (median), parent companies outperform the market by –5.9% (7.0%), indicating a strong negatively skewed distribution. Again, size matters, as large parents on average show negative excess returns of -29.4% while the small ones outperform the market by 18.5% in the three-year period. Kirchmaier (2003) shows that subsidiary firms are more suc-cessful in the three years after the transaction than their parents. He documents for sub-sidiaries an average (median) excess return significant at the 10% level of 17.3% (18.6%). Size matters also for the subsidiaries, as subsidiaries of large firms perform worse than those of small firms: The large subsidiaries outperform the market on aver-

age (median) by -5.9% (11.5%) while the small firms outperform the market by more than 45%, significant at the 1% level, with a median value of 39.0%.

The paper of Veld and Veld-Merkoulova (2004) is of special interest as it is the broadest and most recent study exploring the long-term stock market performance of European spin-off firms. Their sample consists of 156 spin-offs in the period 1987 to 2000. They document that the long-run returns in excess of equally weighted matching firms are insignificant and in excess of value weighted matching firms mostly insignificant. Subsidiaries perform better than their parent firms by adjusting with equally weighted matching firms and worse by adjusting with value weighted matching firms. Industrial focus and size has no substantial influence on the long-term abnormal returns of European spin-off firms. Geographical focus in contrast seems to have a negative influence on long-term abnormal returns, though this influence is caused by negative earnings surprises of these companies.

3.2.2.2   Carve-outs

The long-term stock market performance of US carve-outs is partially investigated, whereas to the best of my knowledge, no broad study on the long-term performance of European carve-outs has been conducted to date (Table 8). In the first twelve months after the transaction, carve-out firms seem to perform more or less in line with the market and matched firms; however in the subsequent years carve-out parents and subsidiaries perform substantially worse than the market and matched firms. Hence, the long-term stock market performance of carve-outs firms is worse than those of spin-offs. Comparing the long-term abnormal returns of carved-out subsidiaries with the one of their former parents indicates that subsidiaries in the period from 1966 to 2000 covered in existing research perform less bad than their parents. Carve-outs in the 1990s mostly destroyed value (Annema, Fallon, Goedhart, 2001).

Klein, Rosenfeld and Beranek (1991) are the first to investigate the long-term stock market performance of US carve-outs. They find that carve-outs usually are the first stage of a two-stage process to either dispose the parent's interest in the subsidiary by sell-offs or reacquire the subsidiary company's stocks. Based on their sample of 52 carve-outs from 1966 to 1983, carve-outs followed by a divestiture of the parents remaining interest produce significantly positive abnormal returns over each separate announcement period, as well as over both periods combined. On the other hand, while carve-outs followed by a re-acquisition of subsidiary share also yield positive returns

over both announcement periods, the combined performance measure is not statistically significant as the gains at the announcement are offset by the subsidiary's negative abnormal returns over the interim period.

Table 8: Long-term Stock Market Performance: Literature on US Carve-outs

Source	Timeframe	Sample size	Subject	Window (in months)	Abnormal return Mean (median)	Window (in months)	Abnormal return Mean (median)
Michaely and Shaw (1995)	1981 – 1988	61	Subsidiary	T to T+12	-13.2%	T to T+24	-20.2%
Vijh (1999): BHARs adjusted by market index	1981 – 1995	628	Parent	T to T+12	-5.8%	T to T+36	-4.3%
		628	Subsidiary	T to T+12	1.3%	T to T+36	-2.9%
Vijh (1999): BHARs adjusted by size & B/M	1981 – 1995	628	Parent	T to T+12	-0.6%	T to T+36	-0.7%
		628	Subsidiary	T to T+12	5.2%	T to T+36	8.0%
Vijh (1999): CARs adjusted by size & industry	1981 – 1995	628	Parent			T to T+36	-12.6%
		628	Subsidiary			T to T+36	-5.7%
Vijh (1999) : CARs adjusted by size & B/M	1981 – 1995	628	Parent			T to T+36	-3.0%
		628	Subsidiary			T to T+36	5.0%
Anslinger, Klepper, and Subramaniam (1999)			Subsidiary			T to T+24	12.9%
Anslinger, Bonini, and Patsalos-Fox (2000)	1988 – 1996	46	Parent			T to T+24	5.2%
		67	Subsidiary			T to T+24	12.8%
Annema, Fallon, and Goedhart (2001)*	1990 – 2000	200	Parent			T to T+24	-21.5% (-8.5%)
		200	Subsidiary			T to T+24	-10.0% (-24.9%)
Powers (2001)	1981 – 1998	181	Parent	T to T+12	-7.7% (-12.0%).		
		181	Subsidiary	T to T+12	- 8.0% (-18.1%)		
Powers (2003)	1981 – 1996	181	Subsidiary	T to T+12	8.4%		
Balatbat and Lim (2002)	1982 – 1997	326	Subsidiary	T to T+12	-1.5	T to T+36	-8.7%

* Worldwide carve-outs; T denotes the execution date.

Michaely and Shaw (1995) document negative excess return of 61 carved-out MLPs occurring between 1981 and 1988. The carve-outs underperform the CRSP index by -13.2% in the first year and -20.2% in the first two years after the transaction. Allen (1998) examines the unique case of Thermo Electron, which has established a satellite structure by carving out eleven subsidiaries between 1983 and 1995. Since the first carve-out in 1983, the stock performance of Thermo Electron and its subsidiaries has been remarkable. According to Allen (1998), a 100 USD investment in Thermo Electron shares in 1983 has appreciated to 1,667 USD by the end of 1995, while the same investment in an equally weighted portfolio of industry firms (S&P500) would have increased only to 524 (381) USD. Carved-out subsidiaries also have outperformed industry and market benchmarks: As stated in Allen (1998) a 100 USD investment in an

equally weighted portfolio of shares in Thermo subsidiaries increased to 634 USD during the five-year period following the carve-outs. Whereas the benchmark portfolio of firms in the same industries rose to 183 USD, the S&P500 rose to 180 USD during the same period.

Vijh (1999) is the first broad study exploring the long-term stock market effects of carve-outs using an extensive sample of 628 carve-outs taking place between 1981 and 1995 as well as various approaches and benchmarks; he utilizes BHARs, CARs, annual calendar year excess returns and the Fama-French (1993) three factor regression. A value-weighted market index, size and book-to-market, industry and size, and earnings-to-price matching firms, and parent firms are used as benchmarks. Based on BHARs, CARs, and annual calendar year excess returns, Vijh (1999) showed that subsidiary firms do not destroy value in the three years after the transaction, while parent firms do. Subsidiary (parent) firms earn -2.9% (-4.3%), 8.0% (-0.7%), 4.4% (-12.7%), 5.7% (-3.3%), and 7.6% (-7.6%) BHARs compared to the five benchmarks in the three years after the transaction. Using CARs, the subsidiary (parent) stocks mostly outperform (underperform) the three chosen benchmarks with 5.0% (-3.0%), -5.7% (-12.6%), and 1.2% (-9.0%). The annual average excess returns of subsidiary (parent) portfolios with reference to the three matching firm portfolios are 5.3% (-2.6%), -4.0% (-5.4%) and 2.4% (-2.2%) for the entire period from 1981 to 1995. Dividing the sample into two subperiods (1981 to 1989 and 1990 to 1995) shows that in the first subperiod the performance of spin-off firms was better than in the second. The annual average excess returns of subsidiaries adjusted for size and book-to-market matching portfolios is 12.7% in the first subperiod and –4.3% in the second. Contrary to the other three approaches, the Fama-French (1993) three-factor model shows that both the subsidiary and parent stocks earn mainly negative excess returns. Based on monthly returns, the intercepts for equally weighted portfolios of subsidiary (parent) stocks equal -0.2% (-0.4%) and for value-weighted portfolio -0.1% (0.2%) per month.

Anslinger, Klepper, and Subramaniam (1999) document that US carve-outs show an average annual buy and hold excess return in the two years following the event compared to the Russell 2000 index of 12.9%. Anslinger, Bonini and Patsalos-Fox (2000) analyzed the performance two years after the transaction of 46 parent and 67 subsidiary companies created by carve-outs between 1988 and 1996 in the USA. Parent companies outperform the S&P 500 by 5.2% and subsidiaries the Russell 2000 by 12.8%. Annema, Fallon and Goedhart (2001) examine a sample of 200 carve-outs worldwide occurring between January 1990 and May 2000, each exceeding 50 million USD in transaction

volume. They show that in the two years following the transaction, most carve-outs de-stroy value, with mean (median) buy and hold excess return compared to a value-weighted index for subsidiaries of -10.0% (-24.9%) and for parents of -21.5% (-8.5%). Shareholder value typically increases in those subsidiary firms that aim for full separa-tion, either through a subsequent spin-off or a full public offering.

Based on his sample of 181 carve-outs between 1981 and 1998, Powers (2001) docu-ments a strong underperformance of carve-out firms in the year following the transac-tion. The average (median) abnormal buy and hold return for parents involved in carve-outs in the year after the transaction, compared to their industry benchmark is -4.0% (-6.9%) and to the value weighted index is -7.7% (-12.0%). The underperformance of the carve-out subsidiaries is even stronger: -7.0% (-13.0%) compared to their industry benchmark in the year after the transaction and -8.0% (-18.1%) compared to the value-weighted index.

In another study based on a similar sample, the same author focuses on the performance of the subsidiaries (Powers, 2003). It is highly surprising that in this study the mean outperformance in the first year of the transaction is positive compared to the control portfolio (6.8%) as well as to a value-weighted index (8.4%). The mean cumulative abnormal returns declines in the following four years compared to the control portfolio (value-weighted index): 3.0% (-1.2%) in year 2 and 3.6% (-9.3%) in year 3, -4.0% (-24.6%) in year 4 and especially in the fifth year after the transaction with -20.3% (-48.0%) with only 8% (4%) of all carve-outs with a positive abnormal return[124]. One of his key findings is that the percentage of subsidiary shares sold by parents is negatively related to long-term excess returns: The more parents sell, the worse carved-out sub-sidiaries perform on the stock market in the future.[125]

Balatbat and Lim (2002) examine the buy and hold return of 326 carve-outs firms be-tween 1982 and 1997 up to 3 years after the transaction. Subsidiaries outperform matched firms for the first 7 months with a maximum, insignificant outperformance in the 4th month of 2.5%. Starting from the 8th month the subsidiaries perform poorer than matched firms with a maximum of -18.7% 28 months after the transaction. Comparing

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[124] Though all cumulative excess returns are insignificantly different from zero.

[125] Causality is difficult to establish, as it could either be that selling a large percentage of carve-out shares causes poor performance by eliminating synergies or that parent managers know that the subsidiary per-formance is unsustainable.

the return of the subsidiaries relative to various market indices and relative to associated portfolios classed by CRSP index, no abnormal return is noted. After controlling for the level of discretionary accruals, Balatbat and Lim (2002) find that carve-out subsidiaries with high level of discretionary accruals consistently perform poorly, especially on the third year after the offering. These results are consistent with issuers of the carve-out firm, which manages their earnings upward to influence offer price and subsequent market share prices. As stated in Balatbat and Lim (2002), once this becomes apparent through disappointment in subsequent earnings, the optimism reverses and the share performance of the firms deteriorates.

3.2.2.3   Timing

In self-selected events such as for example IPOs, managers can decide about the particular point in time when they want to undertake them. Hence many studies find evidence that managers' "time" these events to take advantage of a "window of opportunity" when the firm's stock is mispriced and consequently, the full impact of the managerial action is likely not to be captured at the announcement (Bayless and Chaplinsky, 1996; Klein, 1986; Hand and Skantz, 1999b; Baker and Wurgler, 2000). Firms find issuing equity most attractive when the stock market overall and their firm specifically is at an overvalued peak, as this yields them new equity at the cheapest price possible. Therefore, managers have an incentive to time their announcements of carve-outs. Hand and Skantz (1999b), based on their sample of 265 US carve-outs undertaken between 1981 and 1995, discovered that carve-outs correlate with the stock market. First, the return of the overall stock market in the year before the carve-out is substantially above the unconditional expected return. Secondly, the pre-transaction average market return is substantially higher than the return in the year following the transaction. Mahar and Peterson (2000) find no evidence of parent firms attempting to time the market. Powers (2003) on the contrary supports the arguments of Hand and Skantz (1999b) as he observes that carve-outs occur during bull market periods and are hence conducted, not for classic efficiency improvement reasons, but to sell potentially overvalued equity. He documents that carve-out parents sell a greater percentage of shares when subsequent per-

formance is poor. For European carve-outs there is no broad empirical study on market timing so far to the best of my knowledge.[126]

3.2.3   Price Multiples Effects

Woo, Willard, and Daellenbach (1992) bring in a new aspect to the analysis on spin-offs and carve-outs as they examine the effects on price multiples i.e., market-to-book ratios thus combining stock market and accounting based measures. They examine the performance of the subsidiary firms resulting from 51 spin-offs between 1972 and 1986. They document an increase in market-to-book ratios of 0.10, which is rather small and not statistically significant from zero. Their results also show that the market-to-book ratios in the three years subsequent to the transaction did improve in 49% of all firms and got worse in 51%. Anslinger, Klepper and Subramaniam (1999) document for 34 US spin-off firms randomly selected from their sample, that the P/E multiple of parent (pro-forma combined) firms increased by 7% (15%) relative to the market from one year before to one year after the transaction. Parent (pro-forma combined) carve-out firms increase their P/E ratio stronger i.e., by 25% (30%), relative to the market from one year before to one year after the transaction.

3.2.4   Operating Performance Effects

Much of the recent empirical research in accounting and finance focuses on the operating performance based on accounting numbers of firms following certain corporate events.[127]

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[126] Fucks (2003) based on 40 German carve-outs does not find that firm with higher price-to-earnings multiples sell a greater share of subsidiary stocks.

[127] Apart from spin-offs and carve-outs these events include dividend initiation/omission (Healy and Palepu; 1988; Michaely, Thaler and Womack, 1995); IPOs (Jain and Kini, 1994; Mikkelson, Partch, and Shah, 1995; and Pagano, Panetta, and Zingales, 1998); LBOs (Lichtenberg and Siegel, 1990; Kaplan, 1991); MBOs (Kaplan, 1989); M&As (Ravenscraft and Scherer, 1989; Healy, Palepu and Ruback, 1992); repurchases (Dann, Masulis and Mayers, 1991; Grullon and Michaely, 2004); proxy contests (Mulherin and Poulsen, 1998; and Ikenberry and Lakonishok, 1993); R&D increases (Eberhart, Maxwell and Siddique, 2004); SEOs (Healy and Palepu, 1990; and Loughran and Ritter, 1997); sell-offs (Cho and Cohen , 1997);

3.2.4.1   Spin-offs

There are five key studies investigating the operating performance of firms involved in spin-offs in the USA, while to the best of my knowledge, there is no study for European spin-offs to date. However, also the evidence in the USA is hard to assess as different operating performance measures and different benchmarks are used and the studies cover different time periods. Additionally, some studies focus on the change in the operating performance of the subsidiary firm and others on the one of the parent firm.

Woo, Willard, and Daellenbach (1992) were the first to measure the impact on the long-term operating performance of spun-off subsidiary firms. They examine the performance of the subsidiary firms resulting from 51 spin-offs between 1972 and 1986. Return on assets, Alpha based on the CAPM model, market-to-book ratio and inflation-adjusted sales growth are the four measures used. Their results show that the performance did not improve and was just as likely to decline after the spin-off. Over the 3-year post-spin-off period, 55%, 51%, and 49% had lower rates of return on assets, market-to-book ratios, and sales growth than in the corresponding period before the spin-off. Whether the subsidiary and the parent firm sell to similar customers, sell similar products and services and/or use similar production technologies has no impact on the operating performance of the subsidiary.

Cusatis, Miles, and Woolridge (1994) base their findings on a larger sample of 161 tax-free spin-offs over the period from 1965 to 1990. They calculate adjusted growth rates of net sales, operating income before depreciation, capital expenditures, and total assets.[128] They document that before the spin-off, parent firms exhibit poor operating performance. From three years to one year before the transaction, parents' net sales grow 10% less, operating income before depreciation 3% grows less, capital expenditures 17% grow less and their total assets grow 7% less than the overall market. However, after the spin-off, the pro-forma combined firms grow, from one year before t to two years subsequent to the transaction, more in operating income (7%), in total assets (2%) and the same in net sales (0%) than benchmark firms. The spun-off subsidiaries measured alone experience, over the same period, significantly faster growth in sales (15%),

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stock splits (Asquith, Healy and Palepu, 1989); and tracking stocks (Chemmanur and Paeglis, 2000; Billett and Vijh, 2002).

[128] They adjust the raw growth rates by subtracting from it the corresponding median growth rate for all COMPUSTAT firms.

operating income before depreciation (24%), total assets (20%) and capital expenditures (39%) than comparable firms. Thus, while parent firms exhibit poor performance prior to the spin-off, the pro-forma-combined as well as the subsidiary firms appear to have been enabled by the transaction to improve their performance.

Daley, Mehrotra, and Sivakumar (1997) is the third study investigating the operating performance of spin-off firms. They focused on pro-forma combined firms by examining the change in return on assets in the time period from T-2 to T+2. Their sample consists of 85 spin-offs, whereof 60 are industrial focus increasing and 25 are non-focus increasing.[129] From T-1 to T+1 they document significant improvements in return on assets at the raw (3.0%) and adjusted level[130] (3.0%, 2.8%, 3.1%) for focus increasing spin-offs pro-forma combined firms, but smaller or no significant changes for non-focus increasing pro-forma combined firms. These results can be interpreted that performance improvements provide at least a partial explanation for the value increase surrounding spin-off announcements, which is associated with corporate focus. The operating performance improvement is associated with the spin-off parent rather than the subsidiary firm. Focus (non-focus) increasing parents outperform their industry in the year after the transaction by 2.3% (0.7%) and focus (non-focus) increasing subsidiaries outperform only by 0.2% (-0.1%). As stated in Daley, Mehrotra, and Sivakumar (1997), these results do not support the argumentation that the benefit of spin-offs is the improved incentivation of subsidiary firms' management, as their performance can be more directly observed due to the separated stock listing. The results are much more consistent with the argumentation about the benefits of focusing: Spin-offs create value by removing unrelated businesses and allowing parents' managers to focus on their core operations.

Anslinger, Klepper and Subramaniam (1999) examined the operating performance of spun-off subsidiaries in the two years after the transaction. They document a major increase in the mean return on invested capital from 7.4% to 12.9%. Their revenues in-

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[129] They define an increase in corporate focus as occurring when the business that is spun-off has a different two-digit SIC code than the core line of business than that of the parent.

[130] The first benchmark is the median return on assets for all firms that have the same 2-digit-SIC code. The second benchmark is defined as the median ROA for all firms that have the same 2-digit-SIC code and assets values within 20% of the asset value of the firm. The third benchmark is the median ROA for all firms with the same 2-digit-SIC code and whose ROA measure in the year prior to the ex-dividend years is within 20% of the ROA measure.

creases only slightly more than the market in the two years after they begin trading, with an average of 9% compared to the 7% of the overall market.

The results of Desai and Jain (1999) are in line with those of Daley, Mehrotra, and Siva-kumar (1997). They examine the change in operating cash flow divided by total assets of spin-off firms and find that focus-increasing firms exhibit superior operating perform-ance following the transaction compared to firms involved in non-focus improving transactions. To differentiate from the economy-wide or the industry-wide effects, Desai and Jain (1999) focus on matching firm adjusted numbers.[131] The pro forma combined firms involved in focus increasing spin-offs have a mean (median) annual performance from one year to three years after the spin-off of 3.9% (3.1%). Furthermore, the mean change from the pre-spin-off period to the post-spin-off period is 3.0%, which is also statistically significant. In contrast, the operating performance of the non-focus-increasing spin-offs shows no improvement following the spin-offs. Desai and Jain (1999) also investigate the operating performance of parent and subsidiary firms sepa-rately. Their findings are in line with Daley, Mehrotra, and Sivakumar (1997). They document that parent firms perform better after the transaction than their subsidiaries as well as that focus improves post transaction operating performance. Additionally, their results seem to imply that firms may be spinning-off in non-focus-increasing transaction underperforming subsidiaries. Desai and Jain (1999) also provide evidence (based on cross-sectional regressions) of direct association between the change in focus and the stock market performance as well as the operating performance.

3.2.4.2   Carve-outs

Empirical evidence on the long-term operating performance of carve-outs could not be found for European carve-outs and is marginal for US transactions. Michaely and Shaw (1995) concentrate on MLPs with their specific characteristics; Allen (1998) on Thermo Electron alone, and Anslinger, Klepper and Subramaniam (1999) use 21 carve-outs ran-domly selected from their base sample. Hence Powers (2003) represents the key study investigating this issue.

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[131] For each firm in the sample, Desai and Jain (1999) select one matching firm that has the same four-digit SIC code as the sample firm and is closest in size (market value of equity) in the month of the spin-off.

Michaely and Shaw (1995) document that the median ROA of 28 carve-out parents (-0.4%) as well as of 51 carve-out subsidiaries (-5.1%) declines from the year prior to the year after the transaction. Parents slightly increase their leverage defined as long-term debt over total assets while subsidiary firms decrease the indebtedness level.

Allen (1998) states that various operating measures of Thermo Electron have significantly improved due to the carve-outs. The parent company for example, has been able to sustain significant growth in both assets and sales. Before the carve-outs, the company lagged industry peers in ROA and returns on sales. Anslinger, Klepper and Subramaniam (1999) examine the operating performance of subsidiaries for the two years after the transaction and document, on average, a small decline in the return on invested capital from 10.0% to 9.5%. Carve-outs conversely enjoy high revenue growth in the two years after being listed, with an average annual revenue growth rate of 32%, compared to the corresponding figure for the S&P 500 from 1990 to 1997 of 7%.

Powers (2003), based on his analysis of 181 equity carve-outs, documents that the mean (median) return on assets[132] of the carved-out subsidiary peaks in the year of the transaction at 17.2% (15.9%), which is significantly higher than the industry. He finds similar peaked patterns of subsidiaries' operating performance in other measures for example in capital expenditures, profit margin, sales and earnings growth rates. The operating performance of carve-out subsidiaries declines to industry norms over the subsequent five years. Patterns in parent operating data are not as distinctive as for example the average parent ROA is relatively stable throughout this period (around 10.5%). Two characteristics of parents firms, however, are of interest: First, parents consistently underperform their matching samples and secondly, as previously documented by Allen and McConnell (1998), parents have significantly more leverage than their matching samples. Powers (2003) also documents that carved-out subsidiaries typically are the high-profitable, high-growth divisions of the parent company.

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[132] Calculated as operating income before depreciation divided by total assets.

4 Hypotheses on the Value Creation of Spin-offs and Carve-outs

Having discussed the model and empirical studies on the value creation of spin-offs and carve-outs in Chapter 3, Chapter 4 develops testable hypotheses for the value creation of spin-offs and carve-outs. The two overall hypotheses are that spin-offs create more value than carve-outs (Section 4.1) and that the value creation of spin-offs and carve-outs is similar in Europe and in the USA (Section 4.2).

Table 9: Overall Hypotheses

Overall hypothesis	Hypothesis	Operationalization
Type of Transaction	H1: Spin-offs create more value than carve-outs	H1a: **Spin-offs increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **more than carve-outs**.
		H1b: **European spin-offs increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **more than European carve-outs**.
		H1c: **US spin-offs increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **more than US carve-outs**.
Place of Transaction	H2: The value creation of spin-offs and carve-outs is similar in Europe and in the USA	H2a: **European transactions increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **similar to US transactions.**
		H2b: **European spin-offs increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **similar to US spin-offs**.
		H2c: **European carve-outs** increase the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **similar to US carve-outs**.
		H2d: The value creation of spin-offs and carve-outs **does not differ** significantly **depending on the origin of law and/or the level of shareholder protection** in the short-run and/or in the long run.

In order to better understand the differences between spin-offs and carve-outs and the differences between transactions occurring in Europe and the USA, three alternative pillars of rationales for the value creation are developed. These pillars are Strategic Business Portfolio Restructuring (Section 4.3), Timing & Financing Needs (Section 4.4) and Outsiders' Information Asymmetry Reduction (Section 4.5).

An overview on the pillars and the associated hypotheses is depicted in Table 10. The 14 hypotheses will be subsequently tested in Chapter 5.

Table 10: Pillars of Rationales and Associated Hypotheses

Pillar	Hypothesis	Operationalization of Hypothesis
Strategic Business Portfolio Restructuring	H3: Operating Performance Gains	Spin-offs and carve-outs **improve the operating performance** of parent and subsidiary firms following the transaction.
	H4: Strategic Gains	Thanks to strategic gains, spin-offs and carve-outs **increase the relative valuation** (price multiples) of parent and subsidiary firms following the transaction.
	H5: Industrial Focus	Firms involved in spin-offs and carve-outs that **improve the industrial focus increase** the firm value in the short-run and/or in the long run, improve the operating performance, and increase the relative valuation **more than firms involved in non-industrial focus increasing** transactions.
	H6: Geographical Focus	Firms involved in spin-offs and carve-outs that **improve the geographical focus increase** the firm value in the short-run and/or in the long run, improve the operating performance, and increase the relative valuation **more than firms involved in non-geographical focus increasing** transactions.
	H7: Incentive Alignment	Spin-offs and carve-outs improve the alignment of incentives in the subsidiary firm. Therefore, **subsidiary firms increase** the firm value in the long run, improve the operating performance, and increase the relative valuation **more than their parent firms**.
	H8: Independence of Subsidiary	**Subsidiary firms resulting from spin-offs or from carve-outs with a high free float increase** the firm value in the short-run and/or in the long-run, improve the operating performance, and increase the relative valuation **more than subsidiary firms depending on other firms**.
	H9: Relative Size of Transaction	H9a: The **value creation in the short run is higher** in transactions, where the value of the transaction is **relatively large** as compared to the value of the parent company. H9b: The **value creation in the long run is lower** in transactions, where the value of the transaction is **relatively large** as compared to the value of the parent company.
Timing & Financing Needs	H10: Stock Market Timing	H10a: Firms undertake **spin-offs and carve-outs after bull markets**. H10b: Stock market **returns of carve-out firms before the transaction are substantially higher than after** the transaction. There is **no such difference between pre- and post** transaction stock market returns **of spin-off firms**. H10c: **Pre-transaction stock market performance of parent firms is better** than the overall market **for carve-out firms and worse for spin-off firms**.
	H11: Relative Valuation Timing	H11a: **Price multiples of carved-out subsidiaries are at a high level** in the year of the transaction, while they are on a **low level for spin-off subsidiary firms**. H11b: **Price multiples of carved-out subsidiaries are higher** in the year of the transaction **than the ones of their parents**, while **spin-off parents have higher multiples than their subsidiaries**.
	H12: Operating Performance Timing	H12a: **Operating performance of carved-out subsidiaries is at a high level** in the year of the transaction, but at a **low level for spin-off subsidiary firms**. H12b: **Operating performance of carved-out subsidiaries is better than that one of their parents** in the transaction year, while **spin-off parents have a better operating performance than their subsidiaries**.
	H13: Financing Needs	H13a: Firms with **cash needs due to a high leverage** choose to **divest through carve-outs** as opposed to spin-offs. H13b: Firms with **cash needs due to high growth expectations** choose to **divest through carve-outs** as opposed to spin-offs.
Outsiders' Information Asymmetry Reduction	H14: Outsiders' Information Asymmetry Reduction	Firms choose to divest through spin-offs or carve-outs if they value the disposed assets higher than the market does: H14a: There is **no change in the operating performance** of parent and subsidiary firms involved in spin-offs and carve-outs. H14b: There is an **increase in price multiples** of parent and subsidiary firms involved in spin-offs and carve-outs.

4.1   Type of Transaction: Spin-offs vs. Carve-outs

In order to build the Type of Transaction Hypothesis "H1", it is useful to show the similarities and the differences between spin-offs and carve-outs. Similarities between spin-offs and carve-outs are that, after both types of transactions, subsidiary firms (1) are separate legal and economic entities having their own management; (2) are subject to disclosure requirements improving the transparency for outside investors and the incentivation of the management; and (3) have their own acquisition currency and underlie the mechanisms of the market for corporate control. However, based on the findings of Chapter 2 and 3, there are also five areas of striking differences between spin-offs and carve-outs that demonstrate the superior value creation potential of spin-off firms as compared to carve-out firms:

1. ***Extent of external financing involved***: A spin-off is a pro-rata distribution of (usually all) the subsidiary's shares to the firm's existing shareholders. As such, it does not involve any cash. In carve-outs, cash is raised, as shares in the subsidiary are sold to the public. Thus, spin-offs are not motivated by the company's desire to generate immediate cash; carve-outs in contrast often become a source of liquidity for firms with cash needs, either as the parents are in financial distress or have large investments to finance. Hence spin-offs are pure restructurings, undertaken for value purposes only, whereas carve-outs, in addition to restructuring, are also a mean of financing.

2. ***Windows of opportunity***: The cost of carve-out financing depends on the valuation of the subsidiary at the time of the transaction. Hence managers have an incentive to deliberately choose a specific point of time for the announcement of carve-outs, thus exploiting a window of opportunity for cheap external equity financing.

3. ***Control retained by the parent company***: As a result of a 100% spin-off, the parent company completely loses its influence on the subsidiary and the subsidiary company becomes totally independent. Thus, a spin-off is a clear-cut separation of the two firms; following restructuring, there are no connections between the parent and subsidiary anymore. Conversely in the case of carve-outs, the parent company maintains a majority interest in the subsidiary subsequent to the transaction, with a large fraction of parents maintaining 80% ownership necessary for tax consolidation purposes. This controlling interest often brings along unclear decision processes and potential conflicts of interests. If the subsidiary is independent, as it is the case in

spin-offs, it no longer faces strategic, competitive or regulatory conflicts with its parent. Thus, independent subsidiaries have greater freedom in defining and implementing their strategy and can react quicker and with more dedication on a changing environment. Independent subsidiaries also benefit from less procedures, standards and of not having to bear the cost of the corporate center. These factors may be a catalyst for radical change.

4. ***Commitment and typical trajectory****:* Carve-outs often are an intermediate step, leading to subsequent transactions. Parent firms involved in carve-outs keep the real option to either reacquire (call option) or to sell- or spin-off the remaining stake (put option). Subsidiary companies resulting from spin-offs, in contrast, are on a stable basis as independent companies and can make their own strategic moves without the threat of intervention by the former parent firm.

5. ***Tax implications***: A disadvantage of carve-outs, as compared to spin-offs, is that carve-outs in most countries cause taxes, while spin-offs generally do not.

A comparison of spin-offs and carve-outs based on the existing empirical studies is difficult, as these studies cover different time periods, sample sizes, geographies and they are measured differently. Comparing the announcement effect of US spin-offs and US carve-outs shows that parent firms in both types of transaction experience higher returns than normally around the announcement date of transactions. The effect seems to be slightly bigger for spin-offs, as most studies document an announcement effect between 2% and 4%, while the same for carve-outs is around 2%. In the long run, US spin-offs show a better stock market performance than carve-outs firms. Hence it seems that the announcement effect does not capture the whole average value creation of spin-offs. Pro-forma combined firms create additional value depending on the methodology applied, to the extent of 5% to 20% in the years after the transaction. US Carve-outs in the 1990s, on the contrary, performed worse than the overall stock market or matching firms. As there is no broad study on the announcement effect or the long-term value creation of European carve-out firms to-date, they cannot be compared to the respective effects of European spin-offs.

Based on the fundamental differences between spin-offs and carve-outs and the existing empirical evidence based on US data, the following hypothesis is constructed:

H1: Type of Transaction Hypothesis

➢ *Spin-offs create more value than carve-outs:*

   *H1a: **Spin-offs increase** the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation **more than carve-outs**.*

   *H1b: **European spin-offs increase** the firm value in the short-run and/or in the long-run, improve the operating performance and increase the relative valuation **more than European carve-outs**.*

   *H1c: **US spin-offs increase** the firm value in the short-run and/or in the long-run, improve the operating performance and increase the relative valuation **more than US carve-outs**.*

4.2 Place of Transaction: European vs. US Transactions

As Europe experiences the consequences of an enlarged competitive arena triggered by the Single Market Program, refocusing has become a high priority in many European companies (Thomson and Pedersen, 2000). It is thus not surprising that during the last decade, spin-offs and carve-outs have become more popular in Europe. Legal formation processes for spin-offs and carve-outs have been simplified in various European countries and are now similar to the ones in the USA. Accounting standards also become more similar as tendencies to align the two key accounting standards, US GAAP and IFRS, are getting stronger. Hurdles such as taxes for spin-offs have also been removed in most European countries (Times Europe, 2002). Differences between the USA and Europe in capital market culture, legal frameworks, ultimate ownership and corporate governance standards, however, still exist.[133] Moreover, the market for corporate control is less active and less developed in Europe than it is in the US.

However, the market environment is not the same throughout Europe. The conditions, particularly in the UK, are closer to the ones in the USA than to the ones in continental

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[133] Brounen, de Jong, and Koedijk (2004), in their survey of 313 firms in the U.K., the Netherlands, France, and Germany, show a substantial variation in corporate governance structures. As expected the Anglo-Saxon countries are more shareholder value focused. Corporate finance practice, on the other hand, appears to be influenced mostly by firm size and to a lesser extent by shareholder orientation, while national differences are weak at best.

Europe. Faccioa and Lang (2001) show that family-controlled firms, for example, are still much more important in continental Europe than in the United Kingdom or in the USA. One of the reasons for this difference between UK and continental Europe are the different legal traditions: civil law and common law. Precedents from judicial decisions shape common law, while civil law is more influenced by contributions of scholars (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998). The common law family includes the law of England and those laws modeled on English law. Common law has spread to British colonies, including the United States, Canada, Australia, and many other countries. Within civil law, legal scholars typically identify three families of laws: French, German, and Scandinavian. Consequently, the value creation of spin-offs and carve-outs may depend on the countries' origin of the law and the related level of shareholder protection. The results of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) show that common law countries generally have the strongest legal protection of investors, French civil law countries have the weakest, and German and Scandinavian civil law countries are located in the middle of the spectrum. Different levels of shareholder protection may drive the different extent of value creation of spin-offs and cave-outs, for example, between the United States and Europe. Shareholders in countries with a low level of shareholder protection may benefit stronger from spin-offs and carve-outs due to the separate listing and the related improvement of reporting and corporate governance. However, Veld and Veld-Merkoulova (2004) do not find a difference in the announcement effect of spin-offs in countries with different corporate governance systems.

The empirical literature currently available on the performance effects of spin-offs and carve-outs still is largely limited to the experience of US firms. The empirical evidence on European carve-outs is especially limited: the short- and long-term value creation effects cannot be compared to those of US carve-outs. For spin-offs, the announcement effect in the USA and in Europe seems to be similar. While there is evidence of positive long-term abnormal returns of US spin-off firms, the results on European spin-off firms are unclear: Veld and Veld-Merkoulova (2004) do not find abnormal long-term value creation while Kirchmaier (2003) documents a long-term stock market outperformance of European spin-off firms. Therefore, a separate analysis focusing on the European market is needed to ascertain whether firms involved in spin-offs and carve-outs earn abnormal returns as a result of this transaction as well and how these results compare to the empirical results for the US market.

The differences between USA and Europe in the markets competitiveness, the legal formation processes, accounting standards and taxes have been removed and the gap in

capital market culture, legal frameworks, ultimate ownership, corporate governance standards and the market for corporate control is shrinking. Based on these logical arguments and the fact that the very limited evidence so far does not show fundamental differences in the value creation of spin-offs and carve-outs on the two continents, the following hypothesis is presented:

H2: Place of Transaction Hypothesis

➢ *The value creation of spin-offs and carve-outs is similar in Europe and in the USA:*

   H2a: **European transactions increase** *the firm value in the short-run and/or in the long-run, improve the operating performance and increase the relative valuation* **similar to US transactions**.

   H2b: **European spin-offs increase** *the firm value in the short-run and/or in the long-run, improve the operating performance and increase the relative valuation* **similar to US spin-offs**.

   H2c: **European carve-outs increase** *the firm value in the short-run and/or in the long run, improve the operating performance and increase the relative valuation* **similar to US carve-outs**.

   H2d: *The value creation of spin-offs and carve-outs* **does not differ** *significantly* **depending on the origin of law and/or the level of shareholder protection** *in the short-run and/or in the long run.*

4.3   Strategic Business Portfolio Restructuring

Many explanations of why spin-offs and carve-outs create shareholder value are linked to Strategic Business Portfolio Restructuring. Sections 4.3.1 to 4.3.7 focus on the different rationales for the value creation within the overall explanation of Strategic Business Portfolio Restructuring. First, the impact of spin-offs and carve-outs on the overall operating performance and the market perception are discussed (Sections 4.3.1 and 4.3.2). The most well known explanation for the value creation of spin-offs and carve-outs is the increase in focus of the parent company. One can differentiate between industrial (Section 4.3.3) and geographical focus (Section 4.3.4). Section 4.3.5 describes the incentive alignment hypothesis, 4.3.6 highlights the hypothesis based on the benefits of independence of the subsidiary and 4.3.7 presents the hypothesis that the value creation depends on the relative size of the transaction.

4.3.1   Operating Performance Gains

Post-transaction improvements in operating performance, such as an improved profit-ability or higher earnings or sales growth, are consistent with the belief that spin-offs and carve-outs increase the operational efficiency. Schipper and Smith (1983) argue that there may be diseconomies of scale by combining disparate assets such as incompatible IT systems or corporate cultures in one firm. As the firm becomes more complex, the costs of decision-making and control may more than offset economies gained from a bigger firm size. Desai and Jain (1999) as well as Hite and Owers (1983) document that spin-offs improve managerial efficiency by reducing the potential for misallocation of capital, eliminating cross subsidies and enabling improved investment decisions. McKenna (2000) stresses that after the separation, management and staff of parent and subsidiary firms can focus on their business instead of wasting resources in internal con-flicts. Hence a divestiture can help to resolve internal political battles over a company's strategic direction, management succession issues or personality problems and therefore lead to efficiency improvements.[134] Therefore, operating performance gains are often associated with spin-offs and carve-outs, resulting in the following hypothesis:

H3: Operating Performance Gains Hypothesis
➢ *Spin-offs and carve-outs **improve the operating performance** of parent and subsidiary firms following the transaction.*

4.3.2   Strategic Gains

Another explanation for the value creation of spin-off and carve-out transactions are strategic gains, as such a transaction increases the strategic flexibility of parents and subsidiaries by facilitating M&As as well as by allowing to form relationships with companies that did not want to cooperate before the transaction. For example, after be-ing split-up from AT&T, Lucent was better able to do business with international tele-

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[134] Schipper and Smith (1986); Anslinger et al. (1997) and Vijh (2002) document operating performance improvement for carve-outs and Daley, Mehrotra, and Sivakumar (1997), Desai and Jain (1999), and Cu-satis, Miles, and Woolridge (1994) provide documentation for spin-offs.

communications companies than it used to as a division of AT&T.[135] Spin-offs and carve-outs also give the freedom for other strategic moves such as further consolidation within the industry. An example of an industry-consolidating spin-off is Syngenta, the spin-off of the agrochemical businesses of AstraZeneca and Novartis. Thanks to this transaction, Syngenta became the world market leader in this area. That kind of transaction might also be an answer to the challenges the parent company faces if it has a portfolio with companies at strongly different stages of the business life cycle. At the end of the 1990s, for example, carve-outs were used to unleash the potential of high-growth businesses. External equity gave high-growth subsidiaries the required flexibility to manage their development, while the parent still had the possibility to initially keep control over their former subsidiaries (Annema, Fallon and Goedhart, 2001).[136]

In the context of this explanation for the value creation of spin-offs and carve-outs, the underlying operating measures such as sales, earnings or book equity are not directly affected by the transaction. However, the market is ready to pay a higher price for it, which results in higher price multiples such as Price/Sales, Price/Earnings and Price/Book. Anslinger, Klepper and Subramaniam (1999) document this by showing that P/E multiples of spin-off and carve-out parent firms increase following the transaction. Based on this first empirical evidence and the logical arguments, the following hypothesis is presented:

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[135] For more details, see Anslinger, Klepper, and Subramaniam (1999). The spin-off of Delphi Automotive Systems Corp. out of General Motors Corp. in 1999 is another example of a transaction enabling the subsidiary to form relationships with competitors of the former parent company (NZZ, 1999).

[136] Another interpretation is that parent firms' managers successfully exploited high valuations of subsidiaries' businesses such as European telecommunication companies did, when they carved-out minority stakes in their Internet Service Providers and Mobile divisions during the tech boom in the end of the 1990s. Some of them (e.g., Deutsche Telekom: T-Online, France Télécom: Wanadoo and Orange, and Telefónica: Terra Lycos) subsequently reintegrated these businesses after the "bust of the tech bubble" at much lower prices.

H4: Strategic Gains Hypothesis

➤ *Thanks to strategic gains, spin-offs and carve-outs **increase the relative valuation (price multiples)** of parent and subsidiary firms following the transaction.*

4.3.3 Industrial Focus

Increasing corporate focus has been a pervasive trend in the last years and it is not surprising that almost every company undertaking a break-up offers the rationale of focus (Campbell, Koch, and Sadtler, 1997). The underlying justification is that firms must be manageable and at the same time understandable for the capital markets. Focused companies are also more flexible and can react quicker on a changing environment. Firms may also use spin-offs and carve-outs to credibly signal that they will commit resources to an industry and thus prevent a market entry by potential competitors.

In empirical studies, transactions are generally defined as focus increasing if the parent company has a different two-digit Standard Industry Classification (SIC) code than the subsidiary. Apart from this, the Herfindahl index and the number of segments reported by the firm are also used to differentiate focus improving from non-focus improving transactions.[137] Existing empirical research documents that the announcement effect is greater for focus increasing spin-offs (Desai and Jain, 1999)[138] and carve-outs (Vijh, 2002)[139]. Daley, Mehrotra, and Sivakumar (1997) and Desai and Jain (1999) provide evidence that the long-term stock market performance of spin-off firms is also better

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[137] The Herfindahl index for a specific firm is calculated as the sum of squares of each segment's revenues as proportion of total revenues. A transaction is classified as focus increasing if there is an increase in the Herfindahl index of the parent firm from the year before to the year after the transaction. Using number of segments a transaction is classified as focus increasing if there is a decrease in the number of segments reported by the parent firm from the year before to the year after the transaction. The classification of focus (based on the three alternative definitions) is robust as approximately 90% of the classifications are insensitive to the definition of focus applied (Desai and Jain, 1999; Vijh, 1999).

[138] See also Hite and Owers (1983), Daley, Mehrotra, and Sivakumar (1997), Krishnaswami and Subramaniam (1999), and Veld and Veld-Merkoulova (2004).

[139] Allen and McConnell (1998) oppose this, as they find no significant difference in the announcement effect for focus increasing as compared to non-focus increasing carve-outs.

after focus increasing transactions.[140] Vijh (1999) documents the same effect for carve-outs.[141] Further empirical studies note that the operating performance of firms resulting from focusing improving spin-offs (Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999) and carve-outs (Vijh, 1999) is better than for firms resulting from non-industrial focus increasing transactions. Based on these arguments and empirical evidence, the following hypothesis is constructed:

H5: Industrial Focus Hypothesis

➢ *Firms involved in spin-offs and carve-outs that **improve the industrial focus increase the firm value in the short-run and/or long run, improve the operating performance, and increase the relative valuation** more than firms involved in non-industrial focus increasing transactions.*

4.3.4   Geographical Focus

Companies cannot only increase their industrial but also their geographical focus by spinning-off or carving-out a foreign division.[142] Based on the literature on the relationship between geographical diversification and the value of the company, one could expect either a positive or a negative relationship between the value creation and an increase in geographical focus.[143] Fewer economies of scale in production and the relative disadvantage to competitors who operate internationally are two arguments against geographical focus. Other theories state that an increase in geographical focus may lead to

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[140] Veld and Veld-Merkoulova (2004) in contrast show that focus has no impact on the long-term stock market performance of European spin-offs. Chemmanur and Yan (2000) provide a theoretical model explaining why focus-increasing transactions have a higher announcement effect as well as higher long-term abnormal returns.

[141] Vijh (1999) shows that subsidiary long-term buy and hold abnormal returns are higher when the parent is less focused before the transaction. He also documents that carve-out parent firms before the transaction are relatively low focused; while 74% of all firms focus on one single business segment, only 25% of the parent firms are single segment firms before the carve-out.

[142] DeLong (2001) shows that mergers that increase both geographical as well as industrial focus enhance shareholder value by 3.0% while the other type of mergers do not create value.

[143] See Bodnar, Tang, and Weintrop (2000); Veld and Veld-Merkoulova (2004); and Denis, Denis, and Yost (2002).

an increase in value as the reduced complexity of the company lowers monitoring costs. Coordinating costs and the possibility of cross-subsidization of less efficient foreign divisions are also reduced. Although the arguments in favor of geographical focus are as convincing as the ones against it, the following hypothesis I built in order to be able to test the effect:

H6: Geographical Focus Hypothesis

➢ *Spin-offs and carve-outs that **improve the geographical focus**, increase the firm value in the short-run and/or long-run, improve the operating performance, and increase the relative valuation **more than firms involved in non- geographical focus increasing** transactions.*

4.3.5   Incentive Alignment

Based on the model of Aron (1991), the incentive alignment hypothesis states that gains from spin-offs and carve-outs arise from the fact that after the transaction, better incentivation is possible. Contracts are possible that enable compensation for subsidiary's management to be tied to subsidiary's stock market performance rather than to subsidiary accounting performance[144] or to the stock performance of the combined firm (Schipper and Smith, 1983). Seward and Walsh (1996), in their study of 78 spin-offs, find that after the transaction, the compensation of the subsidiary's CEO is typically performance-contingent.[145] Schipper and Smith (1986) also notice that the majority of carve-out subsidiaries implement incentive-based compensation plans based on the subsidiary's stock. Anslinger, Klepper, and Subramaniam (1999) support the incentive alignment hypotheses as well, as they find that the subsidiary's operating performance is improved through such means as new incentives for management. Daley, Mehrotra, and Sivakumar (1997) and Desai and Jain (1999) conversely show that the operating performance improvements after spin-offs is associated with the spin-off parent rather than the subsidiary

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[144] See Rappaport (1986) on the shortcomings of contracts tied to accounting numbers such as earnings per share, return on investment, and return on equity.

[145] Furthermore, Seward and Walsh (1996) document that following the spin-off, both the Board of Directors and the Compensation Committees are compromised of a majority of outside directors, which improves internal governance and control mechanisms.

firm, which is in contradiction to the incentive alignment hypothesis. Despite this mixed evidence, the following hypothesis is built based on the plausible argumentation of the Aron (1991) model:

H7: Incentive Alignment Hypothesis

➢ *Spin-offs and carve-outs improve the alignment of incentives in the subsidiary firm. Therefore, **subsidiary firms increase** the firm value in the long run, improve the operating performance, and increase the relative valuation **more than their parent firms**.*[146]

4.3.6   Independence of Subsidiary

Another rationale for the value creation of spin-offs and carve-outs is the independence of the subsidiaries firms. Spin-off subsidiaries, by definition, are independent following the transaction. Carve-out subsidiaries, on the other hand, are only independent if the parent or another company no longer has a controlling stake. Annema, Fallon and Goedhart (2001) provide evidence on the long-term value of independence for subsidiary firms. Based on their sample of 200 carve-outs, they show that carve-out subsidiaries excess returns are the higher, the higher the free float: Subsidiaries with a free float bigger than 75% two years after the transaction show excess returns of 26%; subsidiaries that were acquired (-17%), bought-back or delisted (-17%) and with free float smaller than 75% (-32%) show inferior results. Based on these results the following hypothesis is derived:

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[146] At the announcement only the parent company is listed and it reflects the combined firm. Hence, a differentiation of the value creation around the announcement between the parent and the subsidiary firm cannot be made.

> *H8: Independence of Subsidiary Hypothesis*
>
> ➢ ***Subsidiary firms resulting from spin-offs or from carve-outs with a high free float increase*** *the firm value in the short-run and/or long-run, improve the operating performance, and increase the relative valuation **more than subsidiary firms depending on other firms***.

4.3.7   Relative Size of Transaction

A number of studies find that the announcement effect is larger when the size of the spun-off or carved-out subsidiary firm is bigger as compared to the size of the parent firm.[147] These effects seem to reverse in the long run; small US spin-offs perform better on the stock market in the long run than large spin-offs (Anslinger, Klepper and Subramaniam, 1999). Kirchmaier (2003) confirm this finding for European spin-offs and Vijh (1999) confirms it for US carve-outs. However, these results may also be affected by the joint hypothesis problem. Fama and French (1992, 1993, 1998) provide evidence that stocks of small firms (and stocks of firms with high book-to-market ratios) perform better than stocks of large firms (and stock of firms with low book-to-market). Though, based on this empirical evidence the following hypothesis is constructed:

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[147] For spin-offs see Schipper and Smith (1983); Hite and Owers (1983); Miles and Rosenfeld (1983); Krishnaswami and Subramaniam (1999); Mulherin and Boone (2000); and Veld and Veld-Merkoulova (2004). For carve-outs see Allen and McConnell (1998); Vijh (1999 and 2002); and Mulherin and Boone.

H9: Relative Size of Transaction Hypothesis

H9a: The **value creation in the short run is higher** in transactions, where the value of the transaction is **relatively large** as compared to the value of the parent company.

H9b: The **value creation in the long run is lower** in transactions, where the value of the transaction is **relatively large** as compared to the value of the parent company.

4.4   Timing & Financing Needs

Many studies suggest that managers time corporate events and that financial needs influence the decision of if and how to restructure.[148] Equity market timing refers to the practice of issuing shares at high prices and/or repurchasing at low prices. The intention is to exploit temporary fluctuations in the cost of equity relative to the cost of other means of financing. Existing shareholders benefit from market timing at the expense of entering and/or exiting shareholders. Managers thus have incentives to time the market if they think they are able to time the market and if they care more about existing shareholders than entering and/or exiting ones. Baker and Wurgler (2002) show that market timing has large, persistent effects on the capital structure: Low leverage firms are those that raised funds when their market valuation were high (as measured by the market to book ratio), while high leverage firms are those that raised funds when their market valuation were low.

Timing requires two key assumptions. First managers must want to time their actions and secondly they must also be capable to do it. The capabilities for timing depend on the form of managerial timing: Managers can decide upon transactions based on their capabilities to time (1) the performance of the stock market overall and/or of their company; (2) the relative valuation of their firm based on price multiples; and (3) the operating performance of their firm (meaning that they have and use private information about the sustainability of their firm's operating performance).

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[148] Other studies on corporate events, such as repurchases (Brockman and Chung, 2001), seasoned equity offerings (Lucas and McDonald, 1990), M&As (Dong et al., 2003), and IPOs (Loughran, Ritter and Rydqvist, 1994) find that managers exhibit at least some timing capabilities. For more details on timing, see Erning (2001).

4.4.1 Stock Market Timing

Issuing equity is most attractive for a firm when the stock market overall and its equity specifically is at an overvalued peak; in that way a firm can equity finance most economically. Hand and Skantz (1999b) and Powers (2003) show that managers time the announcement of carve-outs and that the number of carve-outs and the percentage of shares sold correlates with the stock market. The valuation of spin-off firms at the transaction date is less important, as there is no financing element in spin-offs. However, managers of spin-off firms also prefer to have a positive stock market environment to ensure a good start of the subsidiary's stock after being listed (Haas, 2003).

Lucas and McDonald (1990) explain the desire of firms to issue equity after stock price increases based on informational asymmetries. They argue that if a firm's stock price is undervalued due to informational asymmetries, firms delay their planned equity issues until the information asymmetry has been reduced by the release of good news and the consequent increase in stock price. Another hypothesis is that managers are also uncertain about the value of their subsidiaries and based on this, they spin-off (carve-out) subsidiaries following poor (good) firm stock market performance; after a strong past stock market performance they are more secure not to sell equity to cheap in a carve-out. Chemmanur and Paeglis (2000) document that spin-offs underperform the S&P500 by -7.2% in the year prior to the restructuring announcement, while carve-outs outperform the index by 5.9%. Vijh (1999) supports this, as he finds that carve-out parents outperform the market in the year before the transaction by 14.7%. Powers (2001) shows that carve-outs occur in industries in which the stock market returns before the transaction are significantly higher than in either spin-off or sell-off industries. Based on their survey of 392 CFOs in the USA, Graham and Harvey (2001) document that when issuing equity, CFOs are, beside earnings per share dilution, mostly influenced by the recent performance of their company's stock. They document that firms issue stock when their stock price has recently increased. Based on this evidence and argumentation the hypothesis is derived:

H10: Stock Market Timing Hypothesis:

H10a: *Firms undertake **spin-offs and carve-outs after bull markets**.*

H10b: *Stock market **returns of carve-out firms before the transaction are substantially higher than after** the transaction. There is **no such difference between pre- and post**-transaction stock market returns **of spin-off firms**.*

H10c: ***Pre-transaction stock market performance of parent firms is better** than the overall market **for carve-out firms and worse for spin-off firms**.*

4.4.2   Relative Valuation Timing

Analyses of financing decisions show that firms tend to issue equity instead of debt when market value is high relative to book value.[149] Explanations of managerial timing based on relative valuations can be based on Nanda's model (1991) for carve-outs. He assumes asymmetric information between insiders and potential investors concerning the value of the parent and the subsidiary firm. In this model, carve-outs occur when the subsidiary is overvalued relative to the parent. In an interesting approach, Slovin, Sushka, and Ferraro (1995) examine the price effects on rivals of the subsidiary and the parent firm based on the announcement of spin-offs and carve-outs. Consistent with Nanda's model, they find a negative (positive) announcement effect for carve-outs (spin-offs) of rival firms in the subsidiary's industry. Tuna (2002) points in the same direction as he provides evidence that the management undertakes such a transaction to capture valuation rents in highly valued industries. Desai and Jain (1999) and Daley, Mehrotra, and Sivakumar (1997) show that firms spin-off underperforming subsidiaries, whereas Powers (2001 and 2003) documents that carve-out subsidiaries typically are the high-profitable, high-growth divisions. This evidence indicates that parents carve-out (spin-off) divisions that have strong (weak) growth characteristics and premium (low) valuations. Thus, the following hypothesis using price multiples (price-to-earnings, price-to-sales and price-to-book):

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[149] See Asquith and Mullins (1986) for SEOs and Loughran, Ritter, and Rydqvist (1994); and Pagano, Panetta, and Zingales (1998) for IPOs.

> **H11 Relative Valuation Timing Hypothesis:**
>
> *H11a:*   ***Price multiples of carved-out subsidiaries are at a high level*** *in the year of the transaction, while they are at a* ***low level for spin-off subsidiary firms****.*
>
> *H11b:*   ***Price multiples of carved-out subsidiaries are higher*** *in the year of the transaction* ***than the ones of their parents****, while* ***spin-off parents have higher multiples than their subsidiaries****.*

4.4.3   Operating Performance Timing

Timing based on the operating performance assumes asymmetric information about the sustainability of the subsidiaries' operating performance. Analyses on earnings forecasts and realizations around equity issues suggest that firms tend to issue equity at times when investors are overly enthusiastic about earnings prospects (Loughran and Ritter, 1997; Rajan and Servaes, 1997; and Teoh, Welch and Wong, 1998a and 1998b). The results of Powers (2003) indicate that the return on assets of the carved-out subsidiary peaks in the year of the carve-out and declines in the following years. Balatbat and Lim (2002) support this as they show that the carve-out subsidiaries earnings drop after the transaction. Consequently the following hypothesis:

> **H12: Operating Performance Timing Hypothesis**
>
> *H12a:*   ***Operating performance of carved-out subsidiaries is at a high level*** *in the year of the transaction, but at a* ***low level for spin-off subsidiary firms****.*
>
> *H12b:*   ***Operating performance of carved-out subsidiaries is better than that one of their parents*** *in the transaction year, while* ***spin-off parents have a better operating performance than their subsidiaries****.*

4.4.4   Financing Needs

It is often difficult for conglomerates to find ways to finance, particularly if they have several businesses at various stages of the life cycle with different risk-return profiles (McKenna, 2000). The fact that parent firms do not receive any cash in spin-offs, but may receive the proceeds of carve-outs, suggests that carve-outs in contrary to spin-offs provide an opportunity for cash-constrained parents to obtain separate financing without causing negative signals associated with seasoned equity offerings (Mahar and Peterson,

2000).[150] Cash requirements can either be caused by a high level of indebtedness or by investment requirements in order to be able to fulfill high growth expectations.

Schipper and Smith (1986) show that in more than 42% of the 76 carve-outs investigated, management declares financing as a motive for the transaction. Allen and McConnell (1998) confirm this and state that managers of parent firms undertake carve-outs only when the parent firm is capital-constrained that means if the parent firm exhibits a poor operating performance and a high leverage prior to the carve-out.[151] Parent firms of carve-outs also show more need for capital than control firms after the carve-out.[152] Powers (2003) and Fucks (2003) document that liquidity-constrained parents sell a greater percentage of carve-out subsidiary shares than non-liquidity-constrained parents do. This suggests that for many parent firms, carve-outs are a way of generating cash and occur when they are the most effective financing method available to parent firms. Contrary to carve-outs, spin-offs are not motivated by financial distress or a high level of leverage, as the financial leverage is about on the same level for spin-off as for their matching firms (Desai and Jain, 1999). Daley, Mehrotra, and Sivakumar (1997) also find no evidence for an increase in frequency of debt or equity issues made by spin-offs firms before and after the transaction. Based on this evidence, the following hypothesis is constructed:

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[150] Powers (2003) provides evidence that 73.7% of total proceeds in carve-outs are passed on to the parent firm and that half of the deals report remission of funds to the parent as the sole use of proceeds. This relationship suggests that many parents use the carve-out to trade ownership for cash, particularly when parent liquidity is low. Shleifer and Vishny (1992) and John and Ofek (1995) provide similar evidence for asset sales. They document that asset sales are a source of liquidity for financially distressed firms.

[151] Allen and McConnell (1998) find that the announcement effect is higher for carve-outs where the proceeds are used to pay down debt (6.6%), compared to the average excess return of -0.0% for carve-outs where proceeds are retained for investment purposes.

[152] Vijh (2002) documents that carve-out parents issue a greater number of SEOs than matched firms in the three years after the transaction.

> **H13: Financing Needs Hypothesis**
>
> *H13a:* *Firms with* **cash needs due to a high leverage** *choose to* **divest through carve-outs** *as opposed to spin-offs.*
>
> *H13b:* *Firms with* **cash needs due to high growth expectations** *choose to* **divest through carve-outs** *as opposed to spin-offs.*

4.5   Outsiders' Information Asymmetry Reduction

As seen in Section 3.1, there are many models explaining the value creation of spin-offs and carve-outs with a reduction in information asymmetries between the management and the capital markets. According to these models, a negative firm value results due to these information asymmetries - firms can thereby increase their value by spin-offs and carve-outs. A growing amount of empirical literature supports this asymmetric information reduction linked rationale for the value creation, though with alternative explanations.[153] Tuna (2002) and Bliss (1997) explain the value creation of public ownership transactions with the credible commitment to improve the information available about the subsidiary firm to investors. Gilson et al. (1998) assess the improved analyst coverage and understanding as an explanation. Using a sample of 146 transactions, they show that spin-offs bring along a higher and more specialized analyst coverage and increased accuracy of the analysts' earnings forecast.[154] Bates, Coughenour and Shastri (1999) follow another approach: According to them, by creating a separate listed stock for the subsidiary firm, market participants are allowed to base trades directly on the future

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[153] Krishnaswami and Subramaniam (1999) document that companies with higher levels of information asymmetry exhibit higher abnormal returns upon the announcement of spin-offs. Fu (2002) shows that following carve-outs, there is a reduction in information asymmetry among investors of the parent firm, which is value enhancing. Contrary to this, Veld and Veld-Merkoulova (2004) do not find any relation between the level of information asymmetry and the size of the announcement effect for European spin-offs. Vijh (2002) also rejects the asymmetric information hypothesis for the announcement effect of US carve-outs.

[154] Anslinger, Klepper and Subramnaian (1999) support this, as they find that gains in stock prices come among other things from the increase in coverage by analysts especially from the improvement in the quality of analysts' coverage. An example of an increased analyst' awareness is the carve-out of Infineon out of Siemens AG. Following the carve-out, 43 equity analysts mainly dedicated to the semiconductor industry, covered the newly issued Infineon stock (Infineon Technologies AG, 2000).

prospects of the subsidiary. This creates information that cannot be replicated by the voluntary disclosure of information about the subsidiary.[155] Anslinger, Klepper and Subramaniam (1999) find yet another explanation for the value creation as they show that the restructured subsidiaries attract new investors and that there is little overlap between investors in parent and subsidiary firms. They argue that investors like pure plays and spin-offs and carve-outs offer an opportunity for investors to hold these. So based on this foundation the following hypothesis is built:

H14: Outsiders' Information Asymmetry Reduction Hypothesis

➢ *Firms choose to divest through spin-offs or carve-outs if they value the disposed assets higher than the market does:*

   *H14a:There is **no change in the operating performance** of parent and subsidiary firm involved in spin-offs and carve-outs.*

   *H14b: There is an **increase in price multiples** of parent and subsidiary firms involved in spin-offs and carve-outs.*

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[155] Additionally, Bates, Coughenour and Shastri (1999) find that mean bid-ask spreads of spin-off parents falls by 3.11% following spin-offs, which itself is an important source of value creation.

5 Empirical Tests of the Value Creation Effects of Spin-offs and Carve-outs

Chapter 5 is the core of this study as it focuses on the empirical measurement of the value creation induced by spin-offs and carve-outs. In Section 5.1 and 5.2, the data and its sources are described. Section 5.3 is explaining the methodologies to analyze the stock market and the operating performance and price multiples effects. The hypotheses developed in Chapter 4 are subsequently tested in Sections 5.4 to 5.7.

Figure 6: Hypotheses To Be Tested

	Hypothesis	Announcement 5.4	Long-term Stock Market 5.5	Price Multiples 5.6	Operating Performance 5.7
Type of transaction	**H1** Spin-offs create more value than carve-outs	▮	▮	▮	▮
Place of transaction	**H2** The value creation of spin-offs and carve-outs is similar in Europe and in the USA	▮	▮	▮	▮
Pillar 1: **Strategic Business Portfolio Restructuring**	**H3** Operating Performance Gains				▮
	H4 Strategic Gains			▮	
	H5 Industrial Focus	▮	▮	▮	▮
	H6 Geographical Focus	▮	▮	▮	▮
	H7 Incentive Alignment		▮	▮	▮
	H8 Independence of Subsidiary	▮	▮	▮	▮
	H9 Relative Size of Transaction	▮	▮		
Pillar 2: **Timing & Financing Needs**	**H10** Stock Market Timing	▮			
	H11 Relative Valuation Timing			▮	
	H12 Operating Performance Timing				▮
	H13 Financing Needs			▮	▮
Pillar 3: **Outsiders' Inform. Asym. Reduction**	**H14** Outsiders' Information Asymmetry Reduction			▮	▮

▮ Hypothesis tested empirically

The empirical tests start with the announcement effect (Section 5.4). It is tested whether there is an abnormal change in the market capitalization of firms announcing spin-offs and carve-outs. The logical next step is then to examine how spin-off and carve-out firms perform in the long run. These is of special interest as the long-term effects on the

stock market as well as operationally of firms involved in spin-offs and carve-outs are hardly analyzed in empirical studies by now. Sections 5.6 and 5.7 present the results of the effects on price multiples and on the operating performance meaning the profitability, growth and indebtedness of spin-off and carve-out firms.

5.1   Data Sources and Sample of Transactions

A sample of spin-offs and carve-outs announced by European and US firms is used to test the value creation effects. The spin-offs and carve-outs announcements cover the period from January 1, 1990 to April 30, 2003. The relevant deal data of spin-offs is mainly sourced from Thomson Financial Securities Data's (TFSD) Mergers and Acquisitions database, while data on carve-outs is mainly obtained from TFSD's New Issues database.[156] Press searches such as Dow Jones and Reuters are additional sources for transactions. For deals where the details from TFSD are not sufficient to judge the quality, more information is obtained from press searches such as Dow Jones, Reuters, Factiva and Bloomberg. The company codes (Sedols), which are required to download data, are obtained from Bloomberg for both parent and subsidiary companies. SIC codes are mainly provided by TFSD, otherwise from Compustat/Global Vantage and Onesource. The information about the residence country of the firm is received from Bloomberg and if unclear, is validated in literature searches. The announcement date (t) was retrieved from TFSD for spin-offs, while for carve-outs, the announcement date had to individually investigated by press searches, mainly Dow Jones and Reuters. The execution date (T) corresponds in most cases to the initial day of trading of the subsidiary and was received from TFSD' Mergers and Acquisitions and TFSD's New Issues database.

Total return to shareholders (TRS) data and market value data (market capitalization of all the classes of shares "MKT_VAL_OF_EQY") comes from Datastream. Alternative stock market indices are used for the overall market development and hence were gathered in Datastream. For US transactions, two broad, value weighted indexes (the total return index of the S&P 500 COMPOSITE and the net return index of the MSCI USA)

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[156] Formerly known as Securities Data Corporation (SDC) databases. For an overview of the different data
   sources used, see Table 79.

and one small cap index (the total return index of the FRANK RUSSELL 2000) are used. For Europe there are also two broad, value-weighted indexes (the total return index of the DJ STOXX TOTAL MARKET INDEX and the net return index of the MSCI Europe) and one small cap index (the net return index of the DJ STOXX SMALL). Data for the HML and SMB factors, required for the three-factor model analysis, are retrieved from French's homepage for US transactions[157] and calculated based on stock market indices for European transactions.[158]

Financial and accounting data is sourced from Bloomberg.[159] The data gathered compromises of cash and cash equivalents ("CASH_AND_EQUIV"), earnings ("NET_INCOME"), sales ("SALES_REV_TURN"), debt (including short-term borrowing, long-term debt as well as pension provisions) ("BS_ST_BORROW", "BS_LT_BORROW", "BS_PENSION_RSRV"), total shareholder's equity consisting of common equity, preferred equity and minority interests ("TOT_COMMON_EQY", "BS_PFD_EQY", "BS_MINORITY_INT"), total assets ("BS_TOT_ASSET") and EBIT ("IS_EARN_BEF_XO_ITEMS"). Price multiples are calculated by taking market parameters from Datastream, divided by operating data from Bloomberg[160]. All data in this paper is gathered and presented in US Dollars (USD).

The total number of announced transactions gathered from the different sources mentioned above is 1,877, whereof 1,074 (57.2%) are spin-offs and 803 (42.8%) are carve-outs (Table 11). For the announcement effect analysis, 750 transactions were eliminated for the following reasons: (1) No clear announcement date was identifiable, which often occurs for carve-outs; the announcement effect had to be investigated through individual press searches. (2) The parent companies stock data was not available for the period from t-30 to t+30, neither in the Datastream nor in the Bloomberg database. (3) The deal involved contaminated information. (4) The parent company was a venture capital

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[157] I thank Kenneth French for providing data for the HML, SMB, and UMD factors on his web site (http://mba.tuck.dartmouth.edu/pages/ faculty/ken.french).

[158] SMB_t is the difference in returns of the value-weighted DJ STOXX SMALL and the value weighted DJ STOXX LARGE. HML_t is the return on the value weighted Dow Jones STOXX TM VALUE less the return on the value weighted Dow Jones STOXX TM GROWTH.

[159] For the detailed definition of all Bloomberg items, see Table 80. Taking fundamental or operating data from Datastream is avoided; as such data is less robust than the respective Bloomberg data.

[160] Bloomberg resp. Compustat / Global Vantage.

firm.[161]   This elimination of 750 observations left a yet extensive sample of 1,127 trans-
actions, whereof 772 (68.5%) are spin-offs and 355 (31.5%) carve-outs. 861 (76.4%) of
the transactions are from US parent companies and 266 (23.6%) are from European par-
ent companies.

Table 11: Data Sample: Number of Transactions

Sample	Initial / Timing			Announcement Effect			Long-term Stock Market Effects			Operating Performance and Price Multiples Effects		
Type of transaction	Carve-outs	Spin-offs	All	Carve-outs	Spin-offs	All	Carve-outs	Spin-offs	All	Carve-outs	Spin-offs	All
All	**803**	**1,074**	**1,877**	**355**	**772**	**1,127**	**639**	**563**	**1,202**	**650**	**598**	**1,248**
European	196	278	**474**	77	189	**266**	150	142	**292**	164	155	**319**
US	607	796	**1,403**	278	583	**861**	489	421	**910**	486	443	**929**

Out of the 1,877 transactions in the initial sample, 676 transactions were eliminated for
the long-term stock market performance and 630 for the operating performance and
price multiples sample, as data was neither available in the Datastream nor in the
Bloomberg database and/or the deal involved contaminated information. A firm is in-
cluded in the sample as long as it has at least one year's data. The resulting samples of
1,202 resp. 1,248 transactions consist of nearly the same number of carve-outs and spin-
offs. Overall, 74% of the transactions are from US parent companies and 26% are from
European parent companies. The higher number of transactions available for the long-
term stock market analysis as compared to those of the short-term stock market analysis
is explained by the fact that the determination of the announcement date especially for
carve-outs is difficult, but is required for the announcement effect analyses. Hence, the
number of carve-outs in the announcement effect analysis is much smaller (355) than in
the long-run analysis (639 / 650). Additionally, for the long-term stock market analysis
as well as for the operating performance and price multiples effects, the data for the par-
ent and/or the subsidiary firms is analyzed.

Figure 7 shows that spin-offs and carve-outs were already very popular in the United
States at the beginning of the 1990s. The small numbers of transactions in Europe at
that time were mainly spin-offs. From 1995 onwards, the volume of European spin-offs

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[161] Venture capital (VC) companies, which in most cases are not listed, are excluded because VC firms ac-
quire stakes companies for investment purposes only. They might help in turning the company around
and exit as soon as the company is on track.

increased rapidly. The period from January 1995 to the end of 2001 witnessed no less than 216 European spin-offs. Carve-outs become popular in Europe even later; the wave started in 1995 but really took off in the stock market boom in 1999. This might be as in other areas of management and finance that US ideas spill over to the Europe, which takes some time and many countries in Europe such as Germany and Switzerland first had to adapt their legal and tax regulations to facilitate that kind of transaction. Out of the 56 transactions taking place from 1990 to 1994 25 were in the United Kingdom, 6 in Norway and Sweden and 5 in the Republic of Ireland. In this time period no transaction in Switzerland and only 3 in Germany occurred. Common to the USA as well as to Europe is a decline in the number of transactions between 2001 and 2003.

Figure 7: Number of Transactions Year by Year
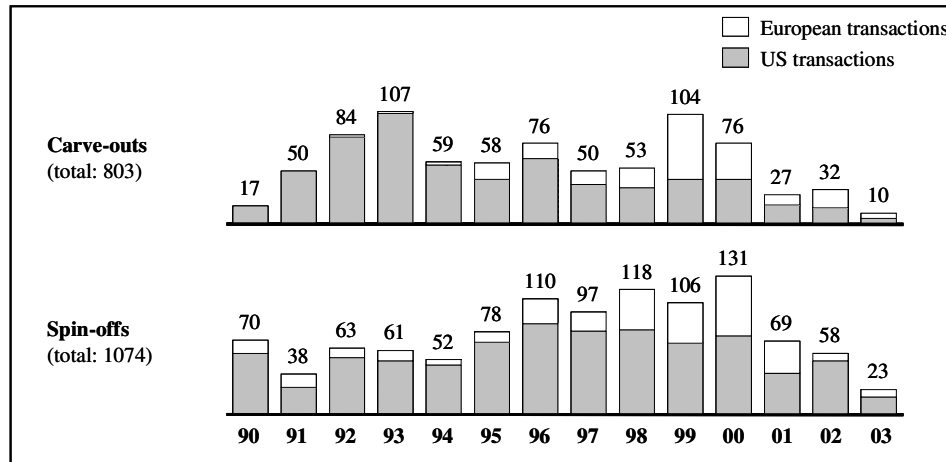
Number of transactions based on a sample of 1,074 spin-offs and 803 carve-outs occurring in the USA and Europe between January 1990 and April 2003.

5.2 Descriptive Statistics

Table 12 shows that spin-offs are, on the average, bigger than carve-outs. This can be partly explained by the fact that only a minority of the subsidiary shares is involved in carve-outs. There is no clear overall pattern whether European or US transactions are on average bigger. The average European carve-out, with 694m USD, is more than twice

as big as the average US carve-out. Spin-offs on the two continents have a similar aver-
age size of roughly 1.2 to 1.4 billion USD. In the USA there are more smaller deals than
in Europe, resulting in a median deal value for US carve-outs of only 77m USD; the
median European carve-out is, with 277m USD deal value, more than 3.5 times that size.
The median European spin-off, with 359m USD deal value, is 60% bigger than the me-
dian US spin-off of 220m USD. Despite the fact that there are more small deals in the
US, very large deals also occur in the USA. More than 91% of US carve-outs are
smaller than 500m USD, while in Europe, one-third of the carve-outs are bigger than
500m USD. Similar results are valid for spin-offs; almost 45% of spin-offs in Europe
are bigger than 500m USD, while in the US, only 33% are at least that size.

Table 12: Data Sample: Deal Size

	Carve-outs			Spin-offs		
	All	European	US	All	European	US
Mean	317.9	693.7	260.8	1'345.5	1'204.8	1'392. 5
Median	84.0	277.0	77.0	238.8	358.5	220.2
Standard deviation	832.3	999.0	789.5	3'973. 7	2'419. 3	4'373. 4
Minimum	0.4	0.4	3.6	0.1	1.0	0.1
Maximum	10'620. 0	5'193. 4	10'620. 0	41'865. 0	17'914. 7	41'865. 0

In USD million; based on a sample of 1145 transactions, whereof 515 are spin-offs (129 European and 386 US) and 630 carve-
outs (83 European and 547 US) that occurred in the USA and Europe between January 1990 and April 2003; initial deal value
partially not available.

Out of the 10 largest transactions as depicted in Table 13, only two took place in Europe
(Table 13). In the top 30 transactions, 22 are from the United States; 26 are spin-offs
and only 4 are carve-outs.

Table 13: Data Sample: 30 Largest Transactions

Deal value (m)	Transaction category	Region	Parent name	Parent country	Subsidiary name	Subsidiary country	Announcement date	Completion date
41'865.0	Spin-off	US	AT&T Corp	United States	Liberty Media Corp	United States	15-Nov-00	10-Aug-01
31'179.5	Spin-off	US	Hewlett-Packard Co	United States	Agilent Technologies Inc	United States	02-Mar-99	02-Jun-00
26'624.6	Spin-off	US	Ford Motor Co	United States	Associates First Capital Corp	United States	08-Oct-97	07-Apr-98
21'815.9	Spin-off	US	US WEST	United States	US WEST Media Group	United States	27-Oct-97	12-Jun-98
17'914.7	Spin-off	EU	Granada Compass PLC	UK	Granada Compass-Hospitality	UK	18-Dec-00	02-Feb-01
17'901.1	Spin-off	US	Palm Inc	United States	3Com Corp	United States	13-Sep-99	27-Jul-00
12'213.0	Spin-off	US	Citigroup Inc	United States	Travelers Property Casualty	United States	19-Dec-01	20-Aug-02
11'761.3	Spin-off	US	Sears Roebuck & Co	United States	Allstate Corp	United States	10-Nov-94	12-Jul-95
11'066.2	Spin-off	EU	BT Group PLC	UK	mmO2 PLC	UK	10-May-01	19-Nov-01
10'836.6	Spin-off	US	Kansas City Southern Inds	United States	Stilwell Financial	United States	15-Jun-00	13-Jul-00
10'620.0	Carve-out	US	AT&T Corp	United States	AT&T Wireless Group	United States	02-Feb-00	26-Apr-00
9'669.6	Spin-off	US	Cognizant Corp	United States	IMS Health Inc	United States	15-Jan-98	30-Jun-98
9'656.0	Spin-off	US	Southern Co Inc	United States	Mirant Corp	United States	20-Feb-01	02-Apr-01
9'310.0	Spin-off	US	US WEST	United States	US WEST Media Group	United States	11-Apr-95	02-Nov-95
9'125.6	Spin-off	US	General Motors Corp	United States	Delphi Automotive Systems	United States	04-Aug-98	28-May-99
8'680.0	Carve-out	US	Altria Group Inc	United States	Kraft Foods Inc	United States	25-Jun-00	12-Jun-01
8'639.0	Spin-off	US	Pacific Telesis Group	United States	PacTel Corp	United States	26-Oct-92	04-Apr-94
7'970.9	Spin-off	US	AT&T Corp	United States	AT&T Wireless Services Inc	United States	22-Dec-00	25-May-01
7'024.0	Spin-off	EU	ZENECA Group PLC	UK	Zeneca (ICI PLC)	UK	30-Jul-92	01-Jun-93
6'529.7	Spin-off	EU	KPN NV	Netherlands	TNT Post Group	Netherlands	06-Mar-98	29-Jun-98
6'033.0	Spin-off	US	Sprint Corp	United States	Sprint PCS	United States	19-May-98	24-Nov-98
5'868.5	Spin-off	US	ITT	United States	ITT Destinations Inc	United States	13-Jun-95	20-Dec-95
5'801.2	Spin-off	US	Bristol-Myers Squibb Co	United States	Zimmer Holdings Inc	United States	22-Feb-01	06-Aug-01
5'708.7	Spin-off	US	ITT	United States	ITT Hartford Group Inc	United States	13-Jun-95	20-Dec-95
5'416.8	Spin-off	EU	Novartis AG	Switzerland	Ciba Specialty Chemicals	Switzerland	7-Mar-96	13-Mar-97
5'363.1	Carve-out	US	Cognizant Corp	United States	Cognizant Technology Solutions	United States	09-Jan-96	01-Nov-96
5'194.2	Spin-off	US	AMR Corp	United States	Sabre Holding Corp	United States	14-Dec-99	15-Mar-00
5'193.4	Carve-out	EU	Siemens Nederland NV	Germany	Infineon Technologies AG	Germany	05-Nov-98	13-Mar-00
5'057.9	Spin-off	EU	AstraZeneca/Novartis	Switzerland	Syngenta	Switzerland	02-Dec-99	13-Nov-00
4'829.2	Spin-off	EU	Hanson PLC	UK	Energy Group PLC	UK	30-Jan-96	24-Feb-97

In USD million; based on a sample of 1145 transactions, whereof 515 are spin-offs and 630 carve-outs that occurred in the USA and Europe between January 1990 and April 2003; initial deal value partially not available.

5.3 Methodology

In terms of methodology, one can differentiate the stock market effect methodology (Section 5.3.1) and the operating performance and price multiples methodology (Section 5.3.2). The stock market effect methodology is consequently applied for the announce-

ment effect (Section 5.4) and the long-term stock market effects (Section 5.5). The operating performance and price multiples methodology is used in Section 5.6 for the price multiples effects and for the operating performance effects in Section 5.7.

Figure 8 shows the timeline in event time used in this study. The announcement date (t) is determined as the day when a member of the senior management of the parent company publicly discloses that the company intends to carve-out or spin-off the subsidiary company. The announcement effect measures the abnormal value creation in the 61 days around this announcement date.

Figure 8: Timeline in Event Time
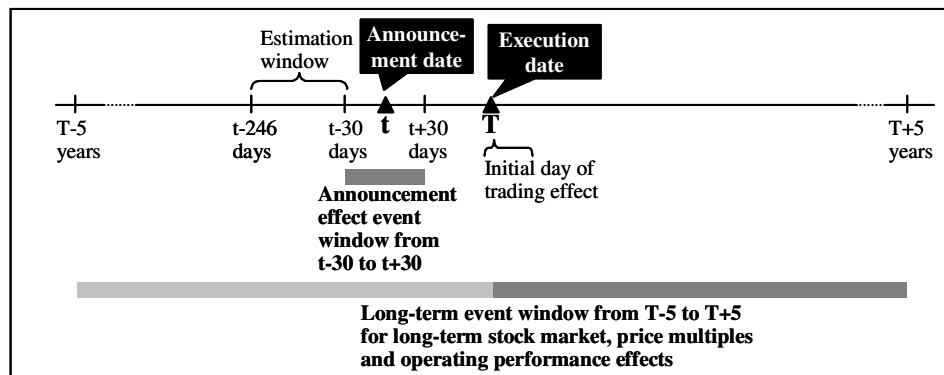
The Execution date (T) is defined as the day and the year at which the transaction became effective.[162] For the long-term stock market, operating performance and price multiple analysis, the data of parents involved in completed transactions is gathered and analyzed for eleven years around the transaction; for the subsidiaries' for the five years subsequent to the transaction. Only the long-term stock market and operational performance of firms involved in completed transactions are analyzed. Hence the long-term performance of firms announcing transactions that were withdrawn later or the completion is still pending, are not included into the analysis.

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[162] The fiscal year end is checked for all firms (Bloomberg item "EQY_FISCAL_YR_END") in order to ensure a proper classification. For a transaction for example effective on June 16, 1997, the parents' sales in year 1997 are defined as sales$_T$. There are many exceptions in year T as for instance that carve-out parent firms' operating performance is overstated, as they book the "gain on sale" on their income statement. Hence, most of the operating analysis focuses on the results before the transaction (T-1 and earlier) and following the transaction (T+1 and later).

5.3.1   Stock Market Effects Methodology

This paper uses the classical event study methodology as described by MacKinlay (1997). Using financial market data, an event study measures the impact of a specific event on the firm value. In the short-term announcement effect analysis, the usefulness of such a study comes from the fact that, given rationality in the marketplace, the effects of the event will be reflected immediately in security prices. Thus, a measure of the event's economic impact can be constructed using security prices observed over a relatively short time period around the announcement date. However, as the market may be not fully rationale and efficient, there might also be long-term effects on the stock market.

Examining the announcement and long-term effects on the stock market depends on many things: the object analyzed (Section 5.3.1.1), the methodology how to calculate returns (Section 5.3.1.2), the asset pricing model and the related issue of expected returns (Section 5.3.1.3), the methodology of calculating abnormal returns (Section 5.3.1.4) and how to assess the statistical significance of the abnormal returns (Section 5.3.1.5). Examining the long-run effects on the stock market is more complicated and controversial than measuring the announcement effect. There are five main hurdles in measuring long run abnormal stock market returns and assessing their significance:[163]

• *Model of asset pricing ("benchmark")*: The most serious problem of studies measuring the long-run abnormal stock returns is the reliance on a model of asset pricing. All tests of the null hypothesis that long-run abnormal stock returns are zero are implicitly a joint test of the long run abnormal returns are zero and that the asset pricing model used to estimate abnormal returns is valid.

• *Rebalancing bias*: This arises because the compounded returns of the benchmark are typically calculated assuming periodic rebalancing.

• *Skewness bias*: This arises because long-run excess returns are positively skewed.

• *Cross-sectional dependence*: This arises because the number of sample firms overstates the number of independent observations and can inflate test statistics.

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[163] For details regarding these five hurdles, see Barber, Lyon and Tsai (1999), Barber and Lyon (1997) and Drobetz, Kammermann and Wälchli (2003).

- *New listing bias*: The new listing bias arises because event studies (of long-run excess returns firms that constitute the benchmark) typically include new firms that begin trading subsequent to the event month.

How and whether these factors affect the specification of test statistics depends on the methodology used to calculate abnormal returns.

5.3.1.1   Object Analyzed

At the time of the announcement, only the parent company's stock is listed at a stock exchange. Hence the object analyzed of all announcement effect event studies is the stock market reaction of the parent company. After spin-offs or carve-outs, both the parent and the subsidiary trade as separate entities on the stock market, and the long-term stock market performance can then be analyzed separately. Former research bases their long-term studies therefore on the parent firm, the subsidiary firm, but sometimes also on the pro-forma combined firm. They create the pro-forma combined firm by weighting the respective parent and subsidiary using their market values of equity for instance at the end of the day of the ex-date. This study focuses on the performance of parents and subsidiary firms separately, in order to better understand the different performances of these two entities.

5.3.1.2   Returns

Simple returns and continuously compounded ("log") returns must be differentiated. While with simple returns geometric average returns must be used, one can use simple averages with continuously compounded returns. Most analyses in this study are performed with simple returns. Some of the announcement effect analyses are also performed with continuously compounded returns as a robustness test, though the results do not substantially differ.

Barber, Lyon, and Tsai (1999) show that continuously compounded returns yield inherently negatively biases when estimating long-run abnormal returns. Consider, for example, a market with two securities, G(ood) and B(ad). Both securities start at the beginning of the period at 100, the value of security G increases by the end of the period to 140 (simple return of 40%) and the value of security B declines to 80 (simple return of -20%). An equally weighted index of the two securities earns a simple return of 10% as the index increases from 100 to 110. The abnormal return with simple returns for G is

30% and for B -30%, and the mean abnormal return with simple returns for the two securities is zero. In contrast, the continuously compounded returns for G and B are 33.6% and -22.3%, while the continuously compounded return on the equally weighted index is 9.5%. Using continuously compounded return to calculate abnormal returns yield an abnormal return of 24.1% for G and -31.8% for B. The mean continuously compounded abnormal return for the two securities is -3.9%. For this reason, Barber, Lyon, and Tsai (1999) "object to the use of continuously compounded returns for analyzing long-run return performance".

5.3.1.3   Expected Returns

To calculate abnormal returns, one must estimate expected ("normal") returns. As there is little consensus about the relevant factors in stock returns, the selection of multiple benchmarks to calculate expected returns is recommended and used by most papers.[164] The impact of the asset pricing model and hence the benchmark for short-term effects is much smaller than for longer-term effects. This paper uses broad stock market benchmarks and it is assumed that the stocks of firms involved in spin-offs and carve-outs, absent of the transaction would have performed in line with the overall market, measured by alternative stock market indices:

$$E(R_{it}) = R_{index,t}$$

This methodology's shortcoming is that the index also includes the firms under examination and might have different characteristics, e.g., different sizes or different book-to-market ratios than the firms involved in spin-offs and carve-outs. One could estimate a firm specific correlation ("beta") with the stock market index. This is done as a robustness test for the short-term analysis, though the influence is negligible. For the long-term analysis, no betas are estimated as there are (1) fundamental issues in estimating beta, (2) the pre-transaction beta of the parent firm does not reflect its risk-return profile following the transaction, (3) there is no data to estimate subsidiary firms' betas and (4) betas in this time period are partially distorted.[165]

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[164] See Desai and Jain (1999), Powers (2001) and Vijh (1999).

[165] Annema and Goedhart (2003) show that one of the effects of the TMT bubble is an ongoing deformation of the Betas; hence also the cost of capital, as many companies estimate the cost of capital based on the CAPM with historical values.

Another way to adjust for the expected development (without the transaction) is to deduct the performance of firms with similar characteristics. The matching firms selected (often called "control firms") are the ones that are closest to the sample firm in the month of the ex-date e.g., in size (market capitalization), book-to-market, price-to-earnings and/or industry (e.g., have the same two-digit or four-digit SIC code).

$$E(R_{it}) = R_{Matchingfirms,t}$$

The stock market return on the sample firm is then compared with the return on the matching firm(s). If the pro-forma combined firm is the object analyzed of the study, weighting the return of the parent's matching firm and the subsidiary's matching firm creates the benchmark portfolio's return. The difficulty of this method is to find the comparable firms particularly for firms in smaller countries and with specific characteristics such as very large or small firms, firms in specific industries etc.

5.3.1.4   Abnormal Returns

The three main methods to calculate abnormal returns used for short-term analyses are Average Cumulative Abnormal Returns (ACARs), Buy and Hold Abnormal Returns (BHARs) and Cumulative Average Abnormal Returns (CAARs). These methodologies are also used to calculate long-term abnormal returns, whereby BHARs are most commonly used for long-term analyses. For the long-term analyses, the Fama-French (1993) three-factor model is also used as a robustness check. Apart from the four methodologies described in this Section, cross-sectional ordinary least squares (OLS) regressions are also applied. Kothari and Warner (1996); Barber and Lyon (1997); Fama (1998); Barber, Lyon, and Tsai (1999); and Mitchell and Stafford (2000) discuss the pros and cons of the alternative methodologies. BHARs capture the investor experience more accurately, while the remaining methods give more reliable test statistics.

For the long-term analysis, the BHARs and the other measures of excess returns are computed, starting with the closing price on the first day of trading and hence exclude the initial day of listing returns. This exclusion is justified for two reasons: First, a significantly positive or negative long-term excess return is a rejection of the joint hypothesis of market efficiency and the specification of the asset pricing model used to calculate the excess return. But a positive initial return is not a rejection of market efficiency. Rock (1986) argues that the initial return is a necessary compensation to less informed investors who are allotted a disproportionately large number of poor quality issues.

Secondly, the allotment of new shares at the offering price is not guaranteed. Thus, including the initial return would overstate the returns that many investors can earn.

Buy and Hold Abnormal Returns

BHARs reflect the impact on investors' wealth if the same amount of money is invested passively in all companies announcing a transaction. Buy-and-hold abnormal returns are defined as:

$$BHAR_{i,1toT} = \prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+E(R_{it}))$$

where $BHAR_{i,1toT}$ is the buy-and-hold abnormal return for security i in the period from 1 to T, R_{it} is the t period buy-and-hold return for security i, and $E(R_{it})$ is the t period expected return for security i based on the asset pricing model. The disadvantage of this approach is that it is more sensitive to the problem of cross-sectional dependence among sample firms and is a poorly specified asset-pricing model.

Cumulative Abnormal Returns

To calculate CARs, one starts with the calculation of abnormal returns for each period of each sample firm by subtracting the expected returns from the actual return.

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

For the announcement effect (long-term stock market) analysis this daily (monthly) abnormal return for each security is calculated beginning 30 days (five years) prior to the announcement (completion) date to 30 days (five years) following the announcement (completion) date. The abnormal return observations must now be aggregated in order to draw overall inferences for the event of interest. As outlined in Barber and Lyon (1997) and MacKinlay (1997), the aggregation is along two dimensions, time and securities, and hence there are two ways. If the abnormal returns are uncorrelated over time and event windows do not overlap, both possibilities provide the same results.

Average Cumulative Abnormal Returns

The first way is to first aggregate for each individual security through time and afterwards aggregate across securities. The Cumulative Abnormal Return (CAR) for a security i from event day 1 to event day T is:

$$CAR_{i,1toT} = \prod_{t=1}^{T}(1+AR_{it})$$

The Average Cumulative Abnormal Return (ACAR) across all securities can then be calculated as:

$$ACAR_{1toT} = \frac{1}{n}\sum_{i=1}^{n}CAR_{i,1toT}$$

The Median Cumulative Abnormal Return (MCAR), is often used as a robustness test across all securities.

Cumulative Average Abnormal Returns

The second way to aggregate abnormal returns is Cumulative Average Abnormal Returns (CAAR). The average abnormal return (AAR$_t$) for event day t is calculated by averaging the abnormal returns (equally-weighted arithmetic average) for all firms:

$$AAR_t = \frac{1}{n}\sum_{i=1}^{n}AR_{i,t}$$

The Average Abnormal Return (AAR$_t$) are then cumulated through event time to calculate the Cumulative Average Abnormal Return:

$$CAAR_{1toT} = \prod_{t=1}^{T}(1+AAR_t)$$

Three-Factor Model Abnormal Returns

Fama and French (1992, 1993, 1998) document that stocks of small firms and stocks of firms with high book-to-market ratios perform better than stocks of large firms and stock of firms with low book-to-market. Therefore, many studies use a three-factor model to

adjust for the market development and the size and the book-to-market effect.[166] The three-factor model is applied by regressing the post-event monthly excess returns for each firm i on a market factor, a size factor and a book-to-market factor:

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it}$$

where R_{it} is the simple return on the stock of firm i and R_{ft}, is the risk-fee return that means the one-month Treasury bill rate (from Ibbotson Associates). For US transactions, R_{mt} is the value-weighted return on all NYSE, AMEX, and NASDAQ stocks (from CRSP), SMB_t is the return on a value-weighted portfolio of small stocks less the return on a value weighted portfolio of big stocks, and HML_t is the return on a value weighted portfolio of high book-to market stocks less the return on a value weighted portfolio of low book-to-market stocks. For European transactions, R_{mt} is the return of the value-weighted DJ STOXX TOTAL MARKET INDEX, SMB_t is the difference in returns of the value-weighted DJ STOXX SMALL and the value weighted DJ STOXX LARGE. HML_t is the return on the value weighted Dow Jones STOXX TM VALUE less the return on the value weighted Dow Jones STOXX TM GROWTH.

The regression yields parameter estimates of α_i, β_i, s_i, and h_i. The error term in the regression is denoted by ε_{it}. Most interesting is the intercept α_i, which indicates an excess return in case it is positive after controlling for market, size and book-to-market in returns. To test the null hypothesis of zero means monthly abnormal returns; a conventional t-statistic is calculated using the time-series standard deviation of the mean monthly abnormal returns.

5.3.1.5   Statistical Tests for Significance

To assess the statistical significance of abnormal returns, three parametric tests (conventional t-test, the skewness-adjusted t-test and the two-sample t-test) and two non-parametric tests (the Wilcoxon Signed Rank test and the Mann-Whitney test) are applied.[167] Barber, Lyon, and Tsai (1999) argue that in random samples, all of the meth-

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[166] The three-factor model may be extended by the Carhart (1997) momentum factor to adjust for stocks that performed well in the last months (earning high rates of return in subsequent months). However, as no data on the momentum effect in Europe is available, this study focuses on the three-factor model.

[167] See the appendix, for a fundamental description of these five statistical tests for significance.

ods that yield well-specified test statistics for long-term BHARs also yield well-specified test statistics for CARs.

5.3.2   Operating Performance and Price Multiples Effects Methodology

Examining the long run operational and price multiple effects depends on the following variables: The object analyzed (Section 5.3.2.1), the measure of operating performance and the price multiple used (Section 5.3.2.2), the expected operating performance and price multiple absent of the transaction (Section 5.3.2.3), the methodology to calculate the abnormal operating performance and price multiples (Section 5.3.2.4) and the tests for statistical significance (Section 5.3.2.5).

5.3.2.1   Object Analyzed

As discussed in Section 5.3.1.1, one must differentiate between the parent firm, the subsidiary firm and the pro-forma combined firm when analyzing the long-term effects. This paper focuses on the effects on the parent and the subsidiary firms separately; in order to better understand in which unit the changes in operating performance and price multiples occur.

5.3.2.2   Measures of Operating Performance and Price Multiples

Researchers use several alternative measures of operating performance. Since each of them has their pros and cons, one should test the robustness of the results by using alternative measures of performance. The measures used in this paper are:

1. *Profitability measures*

- Earnings margin (earnings divided by sales)

- ROA (earnings divided by total assets)

- EBIT margin (EBIT divided by sales)

2. *Growth measures*

- Compound annual revenues growth rates

- Compound annual earnings growth rates

3. *Leverage measure* (debt divided by total assets)

Market-based measures, such as relative valuation measures that reflect the shareholder value of the firm, have been suggested as alternatives to operating performance measures (Woo, Willard, and Daellenbach; 1992). Share price is the value of the stream of earnings over the life of the firm, discounted for the risk to shareholders. Theoretically, it reflects both today's performance and the future growth potential. Peters and Waterman (1982) used price-to-book ratios to measure the long-term wealth creation potential of high performing firms. Fruhan (1979) proposed the use of the P/B ratio for evaluating the overall performance, the benefits of specific competitive and/or corporate restructuring actions.

4. *Relative valuation measures* (price multiples)

• P/E (market capitalization divided by earnings)

• P/B (market capitalization divided by book value of equity)

• P/S (market capitalization divided by sales)

5.3.2.3   Expected Operating Performance and Price Multiples

To assess whether a firm is performing unusually well or poorly, one must specify the performance one expects in the absence of the event, thus providing a benchmark against which sample firms can be compared. There are three main approaches:

• *Same company* (pre- vs. post-transaction performance): The performance of the sample firms after the transaction is often compared to its past, pre-event performance.

• *Industry/market overall*: To adjust for the overall development of the measure in the industry or the market overall, researchers use the median performance of all companies included in industry or market indexes.

• *Matching-firm*: The performance of the sample firms after the transaction is compared to the performance of matching firms. These firms are selected based on pre-defined criteria, often based on industry (two or four-digit-SIC code) and size (market value of equity).

As it reflects best managers' perspective and due to the extensive sample of transactions occurring between January 1990 and April 2003, this paper compares the post-

transaction performance of the firms involved in spin-offs and carve-outs to the pre-transaction performance of the same companies.

5.3.2.4   Abnormal Operating Performance and Price Multiples

To assess whether there is an abnormal change in the operating performance or price multiples, the median operating performance and price multiple over the relevant time period before and after the transaction are presented. Given the skewness of operating performance ratios and price multiples, it is typical to report the difference in median values. Healy and Palepu (1990), Jain and Kini (1994), Mikkelson, Partch, and Shah (1997), Loughran and Ritter (1997), among others, all report median values. The median values are much less sensitive than average values; negative or extremely price multiples or operating performance measures are thereby ignored. To compute the median annual performance and price multiple over the relevant time period, the performance for each firm first has to be computed. A firm is included in the sample as long as it has at least one year's operating performance data. The median annual operating performance or price multiple for the whole sample is thus the median over all the firms in the sample.

By comparing the firms' post-transaction performance to the pre-transaction perform-ances, it is required to adjust for firm-specific effects. Another way to assess the impact of the transaction and assess the abnormal operating performance and price multiples is the regression of the median post-transaction operating performance on the correspond-ing pre-transaction measure (Cho and Cohen; 1997):

$$OPS_{i,POST} = \alpha + \beta OPS_{i,PRE} + \varepsilon_i$$

Where $OPS_{i,POST}$ is the median OPS measure for company i in the three post-transaction years, and $OPS_{i,PRE}$ is the median of the three years before the transaction for the same company. The slope coefficient β captures any correlation in OPS measures between the pre- and post-transaction years. The intercept α is independent of pre-transaction returns and captures the improvement in the median OPS and is therefore the abnormal post-transaction performance. This approach is based on one formerly presented by Healy, Palepu and Ruback (1992). They argue that this specification best controls the continuation of operating performance from the pre-transaction period to the post-transaction period.

5.3.2.5   Statistical Tests for Significance

Barber and Lyon (1996) find that the nonparametric test statistics are uniformly more powerful than parametric t-statistics, regardless of the operating performance measure employed. This result is attributable to the existence of extreme observations in all performance measures. Therefore, to test the statistical significance of the change in operating performance and price multiples, the Wilcoxon Signed Rank Test and the Mann-Whitney Test are applied.[168]

5.4   Announcement Effect

In Figure 9, a plot of equally weighted abnormal return indexes of all spin-offs and carve-outs is depicted for the 61 trading days surrounding the announcement date.

Figure 9: Announcement: Total Return Index
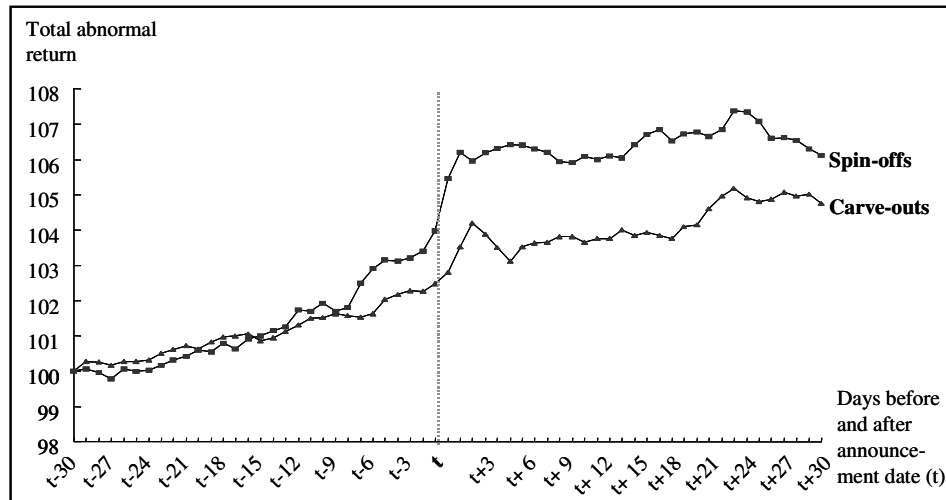
Equally weighted abnormal return indexes (equivalent to CAARs) for the 61 trading days surrounding the announcement date, based on a sample of 772 spin-offs and 355 carve-outs occurring in the USA and Europe between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date.

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[168] See the appendix, for a fundamental description of these five statistical tests for significance.

Calculations are based on the sample of 1,127 events for which proper data is available. Obviously, the announcement of spin-offs and carve-outs conveys a significant proportion of useful information for the market valuation of firms and information processing and hence market revaluation occurs before and after the announcement day. Rumors account for an increase from 100.0 to 101.9 for spin-offs and to 101.5 for carve-outs from t–30 to t-10. In the subsequent 20 days around the announcement date, there is a clear increase to 105.9 for spin-offs and to 103.8 for carve-outs. In the remaining 20 days, both equally weighted abnormal return indexes reach their peak (107.4 for spin-offs and 105.2 for carve-outs), but remain more or less on the same higher level.

Table 14 shows that there are highly significant positive ACARs for spin-offs and carve-outs over most event windows. The ACARs, in the 21 days around the announcement date are 2.8% for spin-offs and 2.3% for carve-outs, both different from zero on a confidence level of 99%. Shortening the event window reduces the value creation of transactions but still remains positive. The lowest ACARs occur at the announcement date itself; a significant 1.4% for spin-offs and 0.3% for carve-outs. The positive and significant abnormal returns for both spin-offs and carve-outs in the event window from t-3 to t+3 are driven by the abnormal return after the announcement. Spin-offs earn a statistically significant average abnormal return of 2.1% and carve-outs of 1.7% in the four days subsequent to the announcement.

Table 14: Announcement: ACARs of Spin-offs and Carve-outs

Transaction type and place	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Spin-offs	**2.8*** (768)	**2.6*** (771)	**2.8*** (772)	**1.4*** (768)	**2.1*** (771)
EU spin-offs	1.6* (188)	2.0*** (189)	3.2*** (189)	1.4*** (189)	1.9** (189)
US spin-offs	3.2*** (580)	2.8*** (582)	2.6*** (583)	1.5*** (583)	2.2*** (582)
Carve-outs	**2.3*** (354)	**2.0*** (354)	**1.6*** (354)	**0.3** (355)	**1.7*** (354)
EU carve-outs	3.8** (76)	3.0*** (76)	2.5*** (76)	-0.4 (77)	1.2 (76)
US carve-outs	1.9** (278)	1.7** (278)	1.3*** (278)	0.5* (278)	1.8*** (278)
H1a Difference spin-offs and carve-outs	**0.5**	**0.6**	**1.2**	**1.1**	**0.4**
H1b Difference EU spin-offs and EU carve-outs	-2.3	-1.1	0.6	1.8	0.7
H1c Difference US spin-offs and US carve-outs	1.3	1.1	1.3	0.9*	0.4
H2a Difference EU trx and US trx	**-0.6**	**-0.2**	**0.8**	**-0.3**	**-0.4**
H2b Difference EU spin-offs and US spin-offs	-1.7	-0.9	0.5	-0.1	-0.4
H2c Difference EU carve-outs and US carve-outs	1.9	1.3	1.2	-1.0	-0.6

Average cumulative abnormal returns (ACARs) in % and in brackets number of transactions; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

5.4.1 Type of Transaction: Spin-offs vs. Carve-outs

Differentiating between spin-offs and carve-outs shows that they create announcement effects on a similar level. Table 14 shows that although spin-offs create higher ACARs in most event windows than carve-outs, the difference between these two different types of transactions is not statistically significant from zero using two-sample t-tests. Only at the announcement date itself, US spin-offs create higher ACARs than carve-outs significant on the 90% confidence level.

Figure 10: Announcement: Histogram of CARs

Spin-offs	
Average:	2.8%
Minimum:	-52.9%
1. Quartile:	-2.2%
Median:	0.8%
3. Quartile:	5.4%
Maximum:	122.7%
Std. Dev.	14.1%
Skewness	3.63
Kurtosis	29.7
Jarque-Bera	24580

Carve-outs	
Average:	1.6%
Minimum:	-55.9%
1. Quartile:	-2.1%
Median:	0.5%
3. Quartile:	3.8%
Maximum:	57.9%
Std. Dev.	8.8%
Skewness	1.15
Kurtosis	16.2
Jarque-Bera	2655
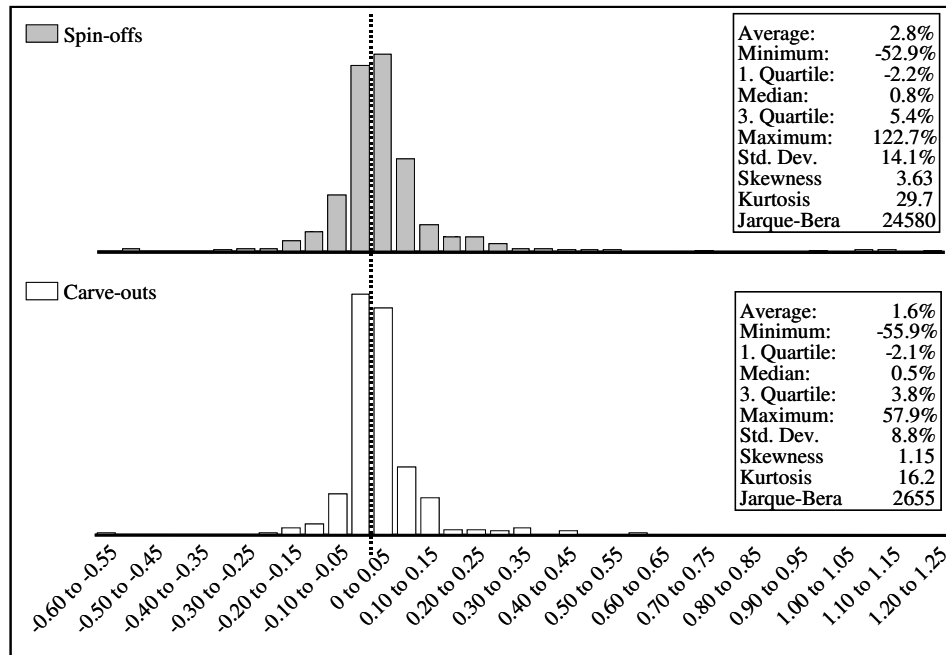
Histogram of CARs from t-1 to t+1 based on a sample of 772 spin-offs and 355 carve-outs occurring in the USA and Europe from January 1990 to April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX).

The distribution of CARs from t-1 to t+1 of spin-offs and carve-outs in Figure 10 shows that spin-offs and carve-outs have similar first quartiles (-2.1% and -2.2%) and medians (0.8% and 0.5%). Hence the higher third quartile (5.4% and 3.8%) and outliers with a maximum value of 122.7% and 57.9% particularly, drive the difference in ACARs (2.8% and 1.6%) of spin-offs and carve-outs. The skewness of CARs of spin-offs is

with 3.63 substantially higher than the one of carve-outs with 1.15. Both distributions of CARs from t-1 to t+1 have a long right tail, are strongly peaked and hence the Jarque-Bera test statistic leads to the rejection of null hypothesis of a normal distribution.[169] For this reason it is worthwhile to compare the median cumulative abnormal returns (MCARs).

Table 15: Announcement: MCARs of Spin-offs and Carve-outs

Transaction type and place	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Spin-offs	**0.4****** (52.2)	**0.6****** (53.7)	**0.8****** (56.7)	**0.4****** (55.8)	**0.4****** (52.0)
EU spin-offs	-0.8*** (48.4)	0.1*** (50.3)	0.6*** (57.1)	0.4*** (54.5)	-0.3*** (48.1)
US spin-offs	0.7*** (53.4)	1.0*** (54.8)	1.0*** (56.6)	0.5*** (56.3)	0.4*** (53.3)
Carve-outs	**1.3****** (56.8)	**0.7****** (54.2)	**0.5****** (54.2)	**0.1****** (51.8)	**0.5****** (54.5)
EU carve-outs	1.1*** (56.6)	1.9*** (61.8)	1.0*** (61.8)	0.3*** (53.2)	0.9*** (56.6)
US carve-outs	1.3*** (56.8)	0.3*** (52.2)	0.4*** (52.2)	0.1** (51.4)	0.5*** (54.0)
H1a Difference spin-offs and carve-outs	**-0.9*****	**-0.1*****	**0.3*****	**0.3*****	**-0.2*****
H1b Difference EU spin-offs and EU carve-outs	-1.9	-1.8*	-0.4	0.1	-1.2
H1c Difference US spin-offs and US carve-outs	-0.6***	0.7**	0.6***	0.4***	-0.1***
H2a Difference EU trx and US transaction	**-0.5*****	**-0.3*****	**0.0*****	**0.1*****	**-0.2*****
H2b Difference EU spin-offs and US spin-offs	-1.5***	-0.8***	-0.4***	-0.1***	-0.8***
H2c Difference EU carve-outs and US carve-outs	-0.2	1.6*	0.6*	0.3	0.4

Median cumulative abnormal returns (MCARs) in % and in brackets share of positive transactions; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank for MCARs and the two sample Mann-Whitney test for the difference in MCARs.

Although MCARs are substantially lower than ACARs, the median spin-off and carve-out firm shows a positive and statistically significant announcement effect over most event windows (Table 15). The MCAR in the event window from t-10 to t+10 is 0.4% for spin-offs and 1.3% for carve-outs. The median AR at the announcement date t itself is 0.4% for spin-offs and 0.1% for carve-outs. While carve-outs overall have signifi-

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[169] Skewness is a measure of asymmetry of the distribution of the series around its mean. The skewness of symmetric distributions, such as the normal distribution, is zero. Positive (negative) skewness means that the distribution has a long right (left) tail. Kurtosis measures the peakedness or flatness of the distribution of the series. The kurtosis of the normal distribution is 3. If the kurtosis exceeds 3, the distribution is peaked (leptokurtic) relative to the normal distribution. If the kurtosis is less than 3, the distribution is flat (platykurtic) relative to the normal distribution. The Jarque-Bera test assesses whether the series is normally distributed. It measures the difference of the skewness and kurtosis of the series with those from the normal distribution. Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as X^2 with two degrees of freedom (Kennedy, 1998; and Eckey, Kosfeld, and Dreger, 2001).

cantly higher MCARs than spin-offs in the longer event windows, they have lower MCARs in the narrow windows. These results are driven by US transactions, whereas in European transactions there are no statistically significant differences in MCARs of spin-offs and carve-outs. Despite the statistically significant positive ACARs and MCARs one has to bear in mind that for example in the event window from t-1 to t+1 43.3% of all spin-offs and 45.8% of all carve-outs have negative CARs. As ACARs as well as MCARs of transactions in event windows after the announcement date are significantly positive, one can conclude that a substantial part of the information processing and hence also the value creation occurs in the days after the day of the announcement. Regarding Overall Hypothesis "H1", the evidence is mixed: "H1a" and "H1c" are supported by the significant differences in MCARs between spin-offs and carve-outs overall and in the US, but differences in ACARs are not statistically different from zero. "H1b" that claims a different value creation in the short-run of European spin-offs and European carve-outs, is rejected, based on ACARs as well as based on MCARs.

5.4.2   Place of Transaction: European vs. US Transactions

Results depicted in Table 14 provide evidence that the positive announcement effect of spin-offs overall is driven by US spin-offs. While US spin-offs generate more positive and highly significant announcement effects, the value creation at the announcement of European transactions is smaller, yet still in most event windows significantly positive. Differences in ACARs between US and EU spin-offs, however, are not statistically significant using two-sample t-tests. MCARs of US spin-offs are also higher than the ones of European spin-offs. The MCAR in the event window from t-3 to t+3 is 1.0% for US spin-offs and 0.1% for European spin-offs. Differences in MCARs between US and European spin-offs are highly significant using the two sample Mann-Whitney tests in all event windows investigated.

In contrast, the market seems to be more enthusiastic about carve-outs announcements in Europe than about carve-out announcements in the US. The ACAR of European carve-outs in the event window from t-3 to t+3 is 1.0% as compared to 0.4% of US carve-outs. The difference in MCARs in the same event window is even more pronounced as European carve-outs have a MCAR of 1.9% and US carve-outs have one of 0.3%. However, differences between European and US carve-outs in ACARs and MCARs are not statistically significant. So "H2"c is supported, while the evidence on "H2a" and "H2b" is

mixed, as US transactions overall and spin-offs specifically seem to have higher ACARs; though not statistically significant, they do have overall significantly higher MCARs than European transactions and European spin-offs.

Differentiating the announcement effect of transactions in specific European countries shows that spin-offs as well as carve-outs in United Kingdom and Germany (the two countries experiencing most transactions in Europe to-date) show stable positive and significant ACARs (Table 16).

Table 16: Announcement: ACARs in European Countries

Country	Transaction type	# of trx overall	# of trx for announcement effect	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
United Kingdom	**All**	**143**	**84**	**3.6****	**4.8*****	**5.7*****	**3.0*****	**4.6*****
	Carve-outs	44	20	3.9*	8.3***	5.9***	2.4**	7.3***
	Spin-offs	99	64	3.4*	3.7***	5.6***	3.2***	3.7***
Germany	**All**	**66**	**33**	**7.2****	**7.5*****	**4.2*****	**1.5****	**3.9****
	Carve-outs	44	18	8.4*	6.3***	4.0***	1.1	3.9*
	Spin-offs	22	15	5.8**	8.9**	4.5*	1.9*	4.0*
Sweden	**All**	**49**	**33**	**2.9****	**1.1**	**2.4****	**0.2**	**0.0**
	Carve-outs	9	5	1.8	-1.4	-0.6	-2.5***	-2.9**
	Spin-offs	40	28	3.1*	1.6	2.9**	0.6	0.5
Italy	**All**	**38**	**25**	**1.6**	**0.5**	**1.4**	**-0.4**	**-0.6**
	Carve-outs	13	8	2.1	0.6	1.3	0.6	1.5
	Spin-offs	21	15	1.3	0.6	1.7	-1.0	-1.6
Switzerland	**All**	**29**	**18**	**-1.4**	**-0.6**	**0.1**	**-0.5**	**-2.0**
	Carve-outs	16	9	-0.7	0.2	0.1	-0.5	-1.3
	Spin-offs	13	9	-2.2	-1.4	0.1	-0.4	-1.6
Norway	**All**	**26**	**13**	**-6.7****	**-4.1*****	**-1.9****	**-1.7****	**-1.7***
	Carve-outs	5	2	-20.0	-8.3***	-3.2	-3.2	-2.3
	Spin-offs	21	11	-4.2*	-3.3**	-1.7*	-1.4*	-1.6
France	**All**	**35**	**12**	**2.8**	**2.8***	**0.5**	**0.7**	**-0.2**
	Carve-outs	27	8	6.4*	3.6*	1.2	0.4	0.8
	Spin-offs	8	4	-4.5	1.1***	-0.8	1.2**	-2.1*
Spain	**All**	**19**	**11**	**-2.0***	**0.5**	**1.6***	**1.3***	**-0.5**
	Carve-outs	15	9	-0.7	0.5	0.6	1.1	-0.9
	Spin-offs	4	2	-7.9	0.6	6.1	2.1	1.4**
Netherlands	**All**	**18**	**9**	**3.4***	**0.7**	**0.8**	**0.0**	**1.4***
	Carve-outs	6	3	5.3*	4.7*	-0.2	-0.8	3.0
	Spin-offs	12	6	2.4	-1.4**	1.3	0.3	0.5

Average cumulative abnormal returns (ACARs) in %; based on a sample of 189 spin-offs and 77 carve-outs occurring between January 1990 and April 2003 in Europe; only countries covered with at least five transactions, transactions adjusted for the DJ STOXX; t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

This is in line with the findings of Veld and Veld-Merkoulova (2004), who also find positive CARs of German and British spin-offs. On the other hand, it is also surprising to find, as there is a prominent distinction between British and German firms with respect to the goal of maximizing shareholder value (Brounen, de Jong, and Koedijk, 2004). While British (and Dutch) firms declare shareholder value as one of their top priorities, German (and French) firms consider this goal even less important than optimizing their solvability. The announcement effect in Sweden, France and the Netherlands seems to be positive, though partially not statistically significant. While the announcement effect of transactions in Spain and Italy fluctuates around 0%, the same seem to be negative for Swiss[170] and significantly negative for Norwegian transactions.

As the empirical sample in European countries is rather thin, interpretation has to be made cautiously. However these transactions give evidence to reject "H1b", which states that European spin-offs and European carve-outs exhibit different abnormal returns at the announcement. This is tested in each European country separately and is rejected based on the two-sample t-test in most countries. Only in Spain in the event windows from t-10 to t+10 and from t-1 to t+1 and the Netherlands in the event window from t-3 to t+3, is there a statistically significant difference between ACARs of European spin-offs and European carve-outs. As the data sample in these two countries is very limited (11 resp. 9 transactions) "H1b" can be rejected for the announcement effect in European countries.

Looking only at carve-outs shows that in UK and Germany, the only two European countries with more than ten carve-outs in the announcement effect analysis, carve-outs generate significantly positive ACARs. In none of the other European countries do carve-outs generate significantly negative ACARs. There are five European countries with more than ten spin-off announcements covered. In UK, Germany and Sweden, positive ACARs are found that are mainly significant. ACARs of Italian spin-offs fluctuate around 0%, while Norwegian spin-offs are negative.

The size of the announcement effect of transactions may depend on the countries' origin of the law and the related level of shareholder protection. The results depicted in Table 17 show that the influence of the origin of the law and the level of shareholder protection on the announcement effects is unclear. Only transactions in countries with Scandina-

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[170] The MCAR shows a more positive picture for carve-outs (1.0%) and spin-offs (0.1%). The average CAR for carve-outs is negatively influenced by the very strongly negative CAR of Converium (-17.5%).

vian origin of law show no significant announcement effect. The results of events with
English origin are driven by transactions in the USA and UK, by far the two countries
with most transactions in the sample used in this study. The relation between ACARs
and the level of shareholder protection measured by the index of anti-director rights of
La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)[171] is also ambiguous. Spin-offs
in countries with a level 4 of shareholder protection generate significantly negative
ACARs. This result is driven by Norwegian spin-offs that exhibit as documented above,
a significantly negative announcement effect. The ACARs in countries with level 5, of
course overwhelmingly driven by US and British transactions, are significantly positive.
There is also no clear pattern of the influence of the shareholder protection level on the
ACARs of carve-outs. Hence "H2d", which states that the value creation in the short-
run is similar in countries with a low and a high level of shareholder protection, is vali-
dated.

Table 17: Announcement: Level of Shareholder Protection and Origin of Law

	Spin-offs			Carve-outs		
	# of trx in an-nouncement sample	t-10 to t+10	t-3 to t+3	# of trx in an-nouncement sample	t-10 to t+10	t-3 to t+3
Origin of Law						
German	28	1.1	3.3*	35	4.6*	2.9**
French	42	-1.2	0.8	32	2.8*	1.4*
Scandinavian	47	0.2	-0.3	7	0.6	1.2
English	650	3.3***	2.9***	279	2.0**	2.0***
Level of Share-holder Protection						
0/1 (low)	36	2.6	3.9**	27	5.2*	4.1**
2	26	-1.9	-1.2	16	0.8	1.2
3	41	3.5**	2.1**	14	6.1**	2.4
4	23	-8.4***	-4.1***	20	1.0	-0.6
5 (high)	641	3.4***	3.0***	276	2.0**	2.0***

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between
January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t
denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness
adjusted t-test for ACARs.

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[171] This index ranges from zero (very low shareholder protection) to seven (very high shareholder protection).
Not surprisingly, the value of the index is lower for countries in continental Europe than for Anglo-Saxon
countries.

5.4.3 Robustness

As test of robustness, the announcement effect is also tested based on alternative methodologies and alternative benchmarks to calculate the expected returns. The effect is additionally tested in other event windows and calculated in calendar times in order to validate whether this effect is stable over time.

5.4.3.1 Methodology

Abnormal returns around the announcement of spin-offs and carve-outs using ACARs, CAARs and ABHARs are very similar.

Table 18: Announcement: Alternative Methodologies

Transaction type and place	Methodology	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Spin-offs	**ACARs**	**2.8***	**2.6***	**2.8***	**1.4***	**2.1***
	CAARs	**4.1***	**3.0***	**2.7***	**1.4***	**2.1***
	ABHARs	**2.7***	**2.6***	**2.2***	**1.4***	**0.6***
EU spin-offs	ACARs	1.6*	2.0***	3.2***	1.4***	1.9**
	CAARs	1.8***	2.1***	3.2***	1.4***	1.9***
	ABHARs	1.6*	2.1***	2.8***	1.4***	0.4
US spin-offs	ACARs	3.2***	2.8***	2.6***	1.5***	2.2***
	CAARs	4.9***	3.2***	2.6***	1.5***	2.2***
	ABHARs	3.1***	2.8***	2.0***	1.5***	0.7
Carve-outs	ACARs	2.3***	2.0***	1.6***	0.3	1.7***
	CAARs	2.3***	1.7***	1.2***	0.3	1.4***
	ABHARs	2.5***	1.9***	1.1**	0.3	1.1***
EU carve-outs	ACARs	3.8**	3.0***	2.5***	-0.4	1.2
	CAARs	2.7***	1.7***	1.1***	-0.4	-0.1
	ABHARs	3.7***	2.7***	0.1	-0.4	0.3
US carve-outs	ACARs	1.9**	1.7**	1.3***	0.5*	1.8***
	CAARs	2.2***	1.6***	1.3***	0.5*	1.8***
	ABHARs	2.1***	1.7***	1.4***	0.5*	1.3***

Average cumulative abnormal returns (ACARs), cumulative average abnormal returns (CAARs) and average buy and hold abnormal returns (ABHARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the conventional t-test for CAARs and the skewness adjusted t-test for ACARs and ABHARs.

In the event window from t-3 to t+3 spin-offs generate ACARs of 2.6%, CAARs of 3.0% and ABHARs of 2.6%. The respective figures for carve-outs are 2.0%, 1.7% and 1.9%. At the announcement date itself, the abnormal returns of the alternative methodologies

are the same by definition. For event windows starting at the announcement date, abnormal returns are, in the sample used in this study, smaller using ABHARs as compared to the ones by using ACARs and CAARs.

As a further test of robustness, the announcement effect is also tested using ACARs based on the market model and with continuous returns.[172] The results are robust, as one generates very similar results using a specific β_i for each firm to calculate expected returns, as well as for the simple market adjusted abnormal returns. Using continuous returns, the announcement effect is smaller, but still exists and is statistically significant.

5.4.3.2   Expected Returns

As shown in Table 19, the announcement effect is very similar using alternative indexes for the calculation of expected returns. Using MSCI US and MSCI Europe to calculate expected returns, the effect is almost the same as by using the SP500 and the DJ STOXX. Using two small cap indices, the Russell 2000 for the USA and the DJ STOXX SMALL for Europe, the abnormal returns around the announcement of spin-offs and carve-outs are bigger than the abnormal returns based on the SP500 and DJ STOXX.

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[172]The market model assumes a linear relationship between the return of any security to the return of the market portfolio: $R_{it} = \alpha i + \beta i\ R_{mt+}\ \varepsilon_{it}$ with an $E(\varepsilon_{it}) = 0$; where t is the time index, i=1, 2, ...,N stands for the securities of firms, R_{mt} and R_{it} are the returns of a broad stock market index and the security i respectively during period t, and ε_{it} is the error term for security i. The expected return is hence calculated by the following formula: $E(R_{it}) = \alpha i + \beta i\ R_{mt}$; α_i and β_i are estimates obtained over a period before the event. In this paper α_i is set to be zero and β_i, the systematic risk, is estimated using an ordinary least squares (OLS) regression for each firm over a 216 days estimation window ending 30 days prior to the announcement date. Applying OLS yields consistent estimates of the conditional mean parameters, even if the true errors are heteroscedastic. This paper uses the simplifying assumption common to most event studies that the sampling error of the estimated parameters is zero, as the estimation window is large.

Table 19: Announcement: Alternative Expected Returns

Transaction type and place	Methodology	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Spin-offs	SP500/DJ STOXX	2.8***	2.6***	2.8***	1.4***	2.1***
	MSCI US/MSCI Europe	2.9***	2.7***	2.8***	1.5***	2.1***
	Russell 2000 / DJ STOXX Small	3.3***	2.8***	2.9***	1.5***	2.2***
EU spin-offs	SP500/DJ STOXX	1.6*	2.0***	3.2***	1.4***	1.9**
	MSCI US/MSCI Europe	1.4*	1.9**	3.1***	1.3***	1.8**
	Russell 2000 / DJ STOXX Small	2.8***	2.3***	3.4***	1.5***	2.1***
US spin-offs	SP500/DJ STOXX	3.2***	2.8***	2.6***	1.5***	2.2***
	MSCI US/MSCI Europe	3.3***	3.0***	2.7***	1.5***	2.2***
	Russell 2000 / DJ STOXX Small	3.5***	2.9***	2.7***	1.5***	2.3***
Carve-outs	SP500/DJ STOXX	2.3***	2.0***	1.6***	0.3	1.7***
	MSCI US/MSCI Europe	2.2***	2.0***	1.6***	0.2	1.6***
	Russell 2000 / DJ STOXX Small	2.4***	1.9***	1.7***	0.3	1.6***
EU carve-outs	SP500/DJ STOXX	3.8**	3.0***	2.5***	-0.4	1.2
	MSCI US/MSCI Europe	3.4**	2.8***	2.2***	-0.7	0.9
	Russell 2000 / DJ STOXX Small	4.4***	2.9***	2.6***	-0.5	0.9
US carve-outs	SP500/DJ STOXX	1.9**	1.7**	1.3***	0.5*	1.8***
	MSCI US/MSCI Europe	1.9**	1.7***	1.4***	0.5*	1.9***
	Russell 2000 / DJ STOXX Small	1.8**	1.7***	1.4***	0.5*	1.7***

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX), the MSCI US (MSCI Europe) and the Russell 2000 (DJ STOXX SMALL); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

5.4.3.3 Event Windows

The analysis on ACARs in alternative event windows confirms the finding that US spin-offs have higher abnormal returns than European spin-offs and that in carve-outs European transactions have higher abnormal returns than US transactions. However, as already documented in the other event windows, differences are mainly not statistically significant using two sample t-tests. In event windows before the announcement date spin-offs have significantly higher abnormal returns than carve-outs. In the 11 days before the announcement date, spin-offs have ACARs of 3.3%; carve-outs have ACARs of 1.1%. This difference is statistically significant on a 95% confidence level and mainly driven by US transactions.

Table 20: Announcement: Alternative Event Windows

Transaction type and place	t-20 to t+20	t-15 to t+15	t-7 to t+7	t-5 to t+5	t-10 to t	t-5 to t	t-3 to t	t to t+5	t to t+10
Spin-offs	**4.2*****	**4.4*****	**3.4*****	**2.9*****	**3.3*****	**2.5*****	**2.3*****	**2.3*****	**1.2****
EU spin-offs	1.4	2.3**	1.8**	1.7**	1.7**	1.7***	1.5***	1.5*	1.5*
US spin-offs	5.1***	5.0***	3.9***	3.3***	3.8***	2.8***	2.5***	2.6***	1.1*
Carve-outs	**3.4*****	**2.7*****	**2.1*****	**1.7*****	**1.1***	**1.1****	**0.6**	**0.9****	**1.6*****
EU carve-outs	8.2***	5.6***	3.2***	2.9***	1.1	1.5	1.4	0.9	2.3**
US carve-outs	2.1**	1.9**	1.8**	1.4**	1.1**	0.9**	0.4	0.9*	1.4**

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

5.4.3.4   Outliers

Table 21: Announcement: ACARs of Spin-offs and Carve-outs without Outliers

	Transaction type and place	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Without 2% outliers (1% positive and 1% negative)	**Spin-offs**	**1.3****	**1.5*****	**1.8*****	**1.1*****	**1.0*****
	EU spin-offs	1.1	1.6***	2.6***	1.3***	1.6***
	US spin-offs	2.1***	2.1***	1.9***	1.3***	1.5***
	Carve-outs	**1.9*****	**1.7*****	**1.4*****	**0.5*****	**1.4*****
	EU carve-outs	2.3**	2.3***	2.3***	-0.7	1.0*
	US carve-outs	1.7**	1.5***	1.2***	0.5**	1.6***
Without 5% outliers (2.5% positive and 2.5% negative)	**Spin-offs**	**1.5*****	**1.8*****	**1.9*****	**1.2*****	**1.3*****
	EU spin-offs	1.0	1.4**	2.4***	1.2***	1.2***
	US spin-offs	1.7***	1.9***	1.7***	1.2***	1.2***
	Carve-outs	**1.8*****	**1.3*****	**1.2*****	**0.4*****	**1.3*****
	EU carve-outs	2.2**	2.3***	2.1***	0.5	1.0*
	US carve-outs	1.6***	1.1***	1.0***	0.4**	1.4***
Without 10% outliers (5% positive and 5% negative)	**Spin-offs**	**1.2*****	**1.5*****	**1.7*****	**1.1*****	**1.0*****
	EU spin-offs	0.9	1.1**	2.1***	1.0***	0.8**
	US spin-offs	1.3***	1.6***	1.6***	1.2***	1.1***
	Carve-outs	**1.6*****	**1.2*****	**1.1*****	**0.4*****	**1.1*****
	EU carve-outs	2.0**	2.0***	1.8***	0.4*	0.9*
	US carve-outs	1.5***	1.0***	0.9***	0.3**	1.2***

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

Spin-offs and carve-outs also create significantly positive ACAR when abstaining from the 1.0%, 2.5% and 5.0% positive and negative outliers (Table 21). However, the announcement effect is smaller. In the seven days event window the effect including all outliers is for spin-offs 2.6% and for carve-outs 2.0%. By abstaining from the 1.0% positive and negative outliers the effect is reduced to 1.5% and 1.7%.

5.4.3.5   Year by Year

Most research on the announcement effect of spin-offs (carve-outs) to-date has been published based on transactions occurring from 1960 to the early 1990s (from 1980 to the mid 1990s). Hence, it is important to assess the stability of the announcement effect over time. The announcement effect is thus investigated separately for each year in the sample period.

Table 22: Announcement: Year by Year

Transaction type and place	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Spin-offs	1.9	-2.3	4.4**	0.7	0.2	3.4***	2.2**	3.9***	0.8	2.3*	0.8	6.9***	4.3	10.0***
	(37)	(16)	(29)	(32)	(31)	(50)	(82)	(75)	(92)	(89)	(107)	(64)	(48)	(19)
Carve-outs	-1.3	6.2***	-0.2	2.4*	4.0**	3.2**	1.9*	1.6*	5.7**	-0.1	0.5	2.0	0.5	1.5
	(7)	(16)	(24)	(30)	(23)	(28)	(42)	(21)	(30)	(38)	(29)	(24)	(32)	(10)
All European transactions	6.0	-0.3	-0.5	2.1	1.0	0.5	2.7**	2.6**	0.5	1.0	2.9*	4.6**	4.2**	-1.2
	(2)	(4)	(2)	(6)	(2)	(9)	(23)	(21)	(36)	(39)	(52)	(36)	(23)	(10)
All US transactions	1.2	2.3	2.5*	1.4	1.9*	3.7***	2.0**	3.6***	2.6*	1.8	-0.6	6.2**	2.2	11.4***
	(42)	(28)	(51)	(56)	(52)	(69)	(101)	(75)	(86)	(88)	(84)	(52)	(57)	(19)
All trx: t-3 to t+3	1.4	1.9	2.3*	1.5*	1.8*	3.3***	2.1***	3.4***	2.0*	1.5*	0.7	5.6***	2.8	7.0***
	(44)	(32)	(53)	(62)	(54)	(78)	(124)	(96)	(122)	(127)	(136)	(88)	(80)	(29)
All trx: t-10 to t+10	1.3	3.3	2.0	1.1	0.7	3.3**	0.7	4.0***	1.3	2.7**	2.7*	10.1***	-1.8	9.1***
	(43)	(32)	(53)	(62)	(54)	(78)	(124)	(96)	(121)	(126)	(136)	(88)	(80)	(29)

Average cumulative abnormal returns (ACARs) from t-3 to t+3 in % and in brackets number of transactions; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

As depicted in Table 22, the positive announcement effect for carve-outs diminished over time, becoming smaller since 1999, while the ACAR in the 7 days event window from t-3 to t+3 for spin-offs increased in the last three years of the sample. Spin-offs (carve-outs) show a positive average ACAR in 13 (11) out of the 14 years covered. The average annual ACAR (MCAR) for spin-offs is, with 2.8% (2.2%), higher than the one of carve-outs with 2.0% (1.8%). The announcement effect of US transactions is more

stable than the cyclical European announcement effect. Overall, European (US) transactions show positive ACARs in 11 (13) out of 14 years in the seven days event window. The average annual ACAR (MCAR) of US transactions is, with 3.0% (2.2%), higher than the one of European transactions with 1.9% (1.6%). As already mentioned above, ACARs increase by enlarging the event window. Hence it is not surprising that the ACARs (MCARs) of all transactions in the 21 days event window from t-10 to t+10 of 2.9% (2.4%) are bigger than the announcement effect in the narrower window with 2.7% (2.1%). Remarkably, the annual ACARs in the event window from t-3 to t+3 are positive in all 14 years covered.

5.4.4   Industrial Focus

As discussed in Sections 4.3.3 and 4.3.4, some researchers argue that the value creation of spin-offs and carve-outs stems from improved industrial or geographical focus.

Table 23: Announcement: Number of Focus Increasing Transactions

Transaction type and place	Industrial focus			Geographical focus		
	All	Spin-offs	Carve-outs	All	Spin-offs	Carve-outs
All	1127	772	355	1127	772	355
n/a	64 (5.7%)	32 (4.1%)	32 (9.0%)	102 (9.1%)	60 (7.8%)	42 (11.8%)
Not Focus	415 (36.8%)	297 (38.5%)	118 (33.2%)	947 (84.0%)	675 (87.4%)	272 (76.6%)
Focus	648 (57.5%)	443 (57.4%)	205 (57.7%)	75 (6.7%)	34 (4.4%)	41 (11.5%)
European	266	189	77	266	189	77
n/a	9 (3.4%)	4 (2.1%)	5 (6.5%)	32 (12.0%)	11 (5.8%)	21 (27.3%)
Not Focus	95 (35.7%)	73 (38.6%)	22 (28.6%)	200 (75.2%)	157 (83.1%)	43 (55.8%)
Focus	162 (60.9%)	112 (59.3%)	50 (64.9%)	31 (11.7%)	18 (9.5%)	13 (16.9%)
US	861	583	278	861	583	278
n/a	55 (6.4%)	28 (4.8%)	27 (9.7%)	70 (8.1%)	49 (8.4%)	21 (7.6%)
Not Focus	320 (37.2%)	224 (38.4%)	96 (34.5%)	747 (86.8%)	518 (88.9%)	229 (82.4%)
Focus	486 (56.4%)	331 (56.8%)	155 (55.8%)	44 (5.1%)	16 (2.7%)	28 (10.1%)

Number of transactions (in %); based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe.

As outlined in Table 23, more than half of the transactions in the sample investigated improve the industrial focus, whereas only few transactions are cross-border improving

the geographical focus.[173]   There is no substantial difference between spin-offs and carve-outs it terms of whether they increase the industrial focus or not. A larger share of European spin-offs and carve-outs improves the industrial and the geographical focus as compared to US transactions.

Table 24: Announcement: Industrial Focus

Transaction type and place		t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Carve-outs	**Difference**	**3.5***	**3.2****	**1.0**	**0.0**	**2.0****
	Ind. Focus	3.2***	3.1***	2.0***	0.3	2.3***
	Not Ind. Focus	-0.3	-0.1	0.9	0.3	0.3
EU carve-outs	**Difference**	**10.5****	**2.5**	**1.8**	**0.0**	**3.0***
	Ind. Focus	7.1***	3.9***	3.0***	-0.6	2.2***
	Not Ind. Focus	-3.3**	1.4	1.2	-0.6	-0.8
US carve-outs	**Difference**	**1.6**	**3.3****	**0.8**	**0.1**	**1.8**
	Ind. Focus	2.0**	2.8***	1.7***	0.6**	2.4***
	Not Ind. Focus	0.4	-0.4	0.9	0.5	0.6
Spin-offs	**Difference**	**-1.2**	**2.7****	**1.6**	**1.2****	**2.9****
	Ind. Focus	2.5***	3.8***	3.5***	1.9***	3.4***
	Not Ind. Focus	3.7***	1.1*	1.9***	0.7**	0.5
EU spin-offs	**Difference**	**1.4**	**1.9**	**3.0***	**0.5**	**0.7**
	Ind. Focus	2.4**	2.8***	4.3***	1.5***	2.2**
	Not Ind. Focus	0.9	0.9	1.3*	1.0*	1.5*
US spin-offs	**Difference**	**-2.0**	**2.9***	**1.2**	**1.4****	**3.6****
	Ind. Focus	2.6**	4.1***	3.3***	2.1***	3.8***
	Not Ind. Focus	4.6***	1.2	2.1***	0.6	0.2

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

Empirical research documents that the announcement effect for US spin-offs occurring between 1963 and 1993 is greater for industrial focus increasing transactions than for not focus increasing transactions.[174]   The results of this study show that the effect survived for transactions occurring from 1990 until 2003. In addition this study documents

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[173] Industrial focus-increasing transactions are defined as transactions with subsidiaries that have a two-digit SIC-code that is different from the parent company. Geographical focus-increasing transactions are defined as transactions with subsidiaries from a different country than the parent firm.

[174] See Hite and Owers (1983); Daley, Mehrotra, and Sivakumar (1997); Desai and Jain (1999); and Krishnaswami and Subramaniam (1999).

that such an effect also exists for US carve-outs[175], European spin-offs[176] and European carve-outs. The influence of industrial focus on the ACARs seems to be similar for spin-offs and carve-outs as well as for US and European transactions. Overall, market participants prefer industrial focus increasing spin-offs and carve-outs, yielding a substantial mean and median difference, as compared to non-industrial focus increasing transactions (Table 24). This supports the Industrial Focus Hypothesis "H5" that spin-offs and carve-outs that improve the industrial focus increase the firm value in the short-run more than transactions not improving the industrial focus.

5.4.5   Geographical Focus

An increase of geographical focus seems to be no major rationale for spin-offs and carve-outs. This can be seen in that, out of the 1127 transactions investigated for the announcement effect, only 75 are cross border. Secondly, there is additionally no clear market preference between cross-boarder transactions and within-boarder transaction at the announcement date (Table 25). In none of the event windows, neither for spin-offs nor for carve-outs, neither for European nor for US transactions, are there statistical significant differences between geographical focus increasing and geographical focus not increasing transactions. Therefore the Geographical Focus Hypothesis "H6", which states that spin-offs and carve-outs that improve the geographical focus increase the firm value more than transactions not improving the geographical focus, is rejected. This is line with the results of Veld and Veld-Merkoulova (2004), which found that European firms spinning-off foreign subsidiaries exhibit only very slightly higher abnormal returns (average 2.8% in the event window from t-1 to t+1) than firms spinning-off domestic divisions (2.7%).

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[175] There is a controversy about the industrial focus effect for US carve-outs; Vijh (2002) documents that industrial focus increases the announcement effect, while Allen and McConnell (1998) oppose this thinking.

[176] Veld and Veld-Merkoulova (2004) is, to the best of my knowledge, the only study covering European transactions to-date; they also find such an effect for spin-offs occurring between 1987 and 2000.

Table 25: Announcement: Geographical Focus

Transaction type and place		t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Carve-outs	**Difference**	**-2.1**	**0.4**	**-0.9**	**-2.9**	**1.1**
	Geo. Focus	0.7	2.4**	0.9*	-2.1	2.7*
	Not Geo. Focus	2.8***	2.0***	1.8***	0.7***	1.7***
EU carve-outs	**Difference**	**-5.7**	**-2.0**	**-1.3**	**-6.9**	**0.9**
	Geo. Focus	1.9	1.1	0.8	-6.6	1.4
	Not Geo. Focus	7.6***	3.0***	2.1**	0.3	0.5
US carve-outs	**Difference**	**-1.7**	**1.1**	**-0.8**	**-0.9**	**1.4**
	Geo. Focus	0.2	3.0**	1.0	-0.1	3.3**
	Not Geo. Focus	1.9**	1.8***	1.8***	0.8***	1.9***
Spin-offs	**Difference**	**-3.4**	**-1.9**	**0.9**	**0.8**	**1.0**
	Geo. Focus	-1.1	0.1	3.3**	2.1**	2.3
	Not Geo. Focus	2.2***	2.0***	2.4***	1.3***	1.3***
EU spin-offs	**Difference**	**0.3**	**-2.2**	**0.2**	**1.1**	**2.3**
	Geo. Focus	2.4	0.4	3.5*	2.4**	4.2*
	Not Geo. Focus	2.2**	2.6***	3.4***	1.3***	1.9**
US spin-offs	**Difference**	**-7.4**	**-2.0**	**0.9**	**0.5**	**-1.0**
	Geo. Focus	-5.2*	-0.2	3.1	1.8	0.1
	Not Geo. Focus	2.3***	1.8***	2.2***	1.3***	1.1**

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

5.4.6 Independence of Subsidiary

Table 26 shows ACARs of carve-outs outlining the trajectory of the subsidiaries two years subsequent to the transaction. About one-fourth of carve-outs is acquired or merged and about half of the carve-out subsidiaries are still listed. As depicted in Table 26, the announcement effect for carve-outs with alternative trajectories is not significantly different from each other.

Table 26: Announcement: Trajectory of Carve-out Subsidiary

Transaction type based on status 2 years after the carve-out	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Acquired or merged	2.8*	2.7*	2.7***	1.3***	2.6**
Buy back	5.1***	6.2**	3.8***	1.4***	6.0**
Delisted	2.6	-0.4	0.6	0.5	0.2
Free float > 75%	-2.0**	0.1	1.0*	0.4	1.3*
Free float 50 - 75%	8.2*	3.7	3.0	0.5	2.9
Free float 0 - 50%	2.0	4.9**	5.7**	3.1**	5.0**
Free float n/a	6.5**	2.6*	1.3	-0.2	0.9

Average cumulative abnormal returns (ACARs) in %; based on a sample of 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs.

Abnormal returns around the announcement do not differ significantly between transactions where the subsidiaries are independent two years following the transaction (spin-offs and carve-outs with a free float bigger than 75%) and transactions with still dependent subsidiaries (other carve-outs). Thus the evidence as presented in Table 27 rejects the Independence of Subsidiary Hypothesis "H8" in the short run. Spin-offs may have a slightly larger announcement effect than carve-outs, but within carve-outs, those transactions leading to independence do not have a higher announcement effect. This can mean on the one hand that investors do not anticipate which carve-out subsidiaries are going to be more independent in the future or that investors do not see substantial differences in the long-term value creation depending on the level of the subsidiaries' independence.

Table 27: Announcement: Independence of Subsidiary

Transaction type	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Difference	**-1.7**	**-0.8**	**-0.2**	**0.2**	**-0.7**
Independent subsidiaries (spin-offs and carve-outs with a free float > 75%)	2.5***	2.4***	2.6***	1.4***	2.1***
Dependent subsidiaries (other carve-outs)	4.2***	3.2***	2.8***	1.1***	2.7***

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

5.4.7 Relative Size of Transaction

Many researchers argue that spinning-off or carving-out relatively big subsidiaries creates higher abnormal short-term returns. To assess the impact of the relative size of the transaction on the announcement effect, the deal value for each transaction (as percentage of the parent market capitalization at the announcement) is calculated. The next step is then the determination of the median relative value for each transaction type (European carve-outs, US carve-outs, European spin-offs and US spin-offs). Transactions with a smaller (larger) relative value than the median are then classified as "small" ("large").

Table 28: Announcement: Relative Size of Transaction

Transaction type and place		# of trx for announcement effect	t-10 to t+10	t-3 to t+3	t-1 to t+1	t	t to t+3
Carve-outs	**Difference**			**-2.1**	**-2.9***	**-2.4****	**-0.6**	**-3.9*****
	Small	122	1.1*	0.8**	0.3	-0.1	0.0
	Large	121	3.1**	3.7***	2.8***	0.5	3.9***
EU carve-outs	**Difference**			**-3.7**	**-2.2**	**-1.6**	**5.1**	**-1.2**
	Small	18	1.3	0.4	0.2	0.1	-0.8
	Large	19	5.0*	2.6	1.8	-5.0	0.4
US carve-outs	**Difference**			**-1.8**	**-3.0**	**-2.6****	**-1.7****	**-4.4****
	Small	103	1.0*	0.8**	0.3	-0.2	0.1
	Large	103	2.8*	3.8***	2.9***	1.5***	4.5***
Spin-offs	**Difference**			**-1.6**	**0.3**	**-0.8**	**-0.3**	**-0.6**
	Small	164	2.2***	2.5***	2.2***	1.5***	1.5***
	Large	164	3.9**	2.2***	3.0***	1.8***	2.2***
EU spin-offs	**Difference**			**-6.5***	**-4.8***	**-5.0***	**-2.1****	**-6.8*****
	Small	44	0.2	0.3	1.1*	0.0	-1.0
	Large	43	6.7**	5.1***	6.1***	2.2***	5.8***
US spin-offs	**Difference**			**0.1**	**2.1**	**0.8**	**0.4**	**1.6**
	Small	121	2.9***	3.3***	2.6***	2.0***	2.5***
	Large	120	2.8*	1.2*	1.8**	1.7***	0.8

Average cumulative abnormal returns (ACARs) in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; sample smaller as no data on relative size of the transaction available; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

As depicted in Table 28, relatively larger transactions generate higher returns at the announcement date, which is in line with previous research on transactions mainly in for-

mer time periods.[177] This effect exists for carve-outs as well as for spin-offs. In the event window from t-1 to t+1, large carve-outs (spin-offs) exhibit a 2.4% (0.8%) higher ACAR than small transactions, supporting the Relative Size of Transaction Hypothesis "H9". The effect is more pronounced and significant for carve-outs than for spin-offs. This may be, as the larger the carve-out subsidiaries relatively to their parents, the more proceeds are generated. This is particularly important, as funding needs may be one of the key motivations to conduct carve-outs. For carve-outs, US transactions drive the effect. In fact, only large US carve-outs create positive ACARs significantly different from zero. For spin-offs, the difference between the ACAR of large as compared to small transactions is substantially bigger for European transactions than for US transactions.

5.4.8   Timing

Analyzing the impact of the various timing factors on the announcement effect shows that there is a significant influence of market timing on the announcement effect: (1) parents' two years raw return before the transaction; (2) price multiples of the parent firm before and following the transaction; (3) the profitability of the parent firm in the year following the transaction; and (4) the parent's earnings growth following the transaction; all have significant influence on announcement ACARs.

5.4.8.1   Stock Market Timing

As depicted in Table 29, parent firms with positive raw returns in the two years before the transaction exhibit substantially higher ACARs than firms with negative pre-transaction returns. The ACAR in the window from t-3 to t+3 for all transactions with positive (negative) parent returns in the two years before the transaction is 4.0% (0.4%), resulting in a difference of 3.5%. This is significant on the 99% level using the two sample t-test. Index returns before and after the transaction, subsidiary raw returns before

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[177] Schipper and Smith (1983), Hite and Owers (1983), Miles and Rosenfeld (1983), Krishnaswami and Subramaniam (1999), and Mulherin and Boone (2000) showed this for US spin-offs; Veld and Veld-Merkoulova (2004) showed this for European spin-offs and Allen and McConnell (1998), Vijh (1999 and 2002), and Mulherin and Boone (2000) for US carve-outs (See also Section 4.3.7).

and after the transaction and adjusted parent and subsidiary returns before and following the transaction, in contrast, cannot explain differences in the announcement effect.

Table 29: Announcement: ACARs Depending on Returns

		Index				Parent				Subsidiary	
		Before		After		Before		After		After	
		2 years	1 year	1 year	2 years	2 years	1 year	1 year	2 years	1 year	2 years
Raw returns	**Difference**	**-1.0**	**-0.5**	**0.4**	**0.8**	**3.5***	**0.4**	**-1.0**	**-1.8***	**-0.8**	**-2.1***
	Positive	2.2***	2.2***	2.4***	2.5***	4.0***	2.7***	1.9***	1.8***	2.3***	1.7***
	Negative	3.1***	2.7***	2.0**	1.7**	0.4	2.3***	2.9***	3.6***	3.0***	3.8***
Adjusted returns	**Difference**					**0.0**	**1.1**	**-1.3**	**-1.5**	**-1.3**	**-0.3**
	Positive					2.6***	3.1***	1.6***	1.7***	1.9***	2.4***
	Negative					2.6***	2.0***	2.9***	3.1***	3.2***	2.7***

Average cumulative abnormal returns (ACARs) from t-3 to t+3 in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

Table 29 gives indications that market participants do not properly anticipate the future stock market value creation. Parent as well as subsidiary firms with positive raw returns in the two years after the transaction, experience lower ACARs than firms with negative post-transaction returns. While the average announcement effect in the event window from t-3 to t+3 for all transactions with negative returns of the parent (subsidiary) in the year after the transaction is 2.9% (3.0%), it is only 1.9% (2.3%) for those companies that exhibit a positive return during the following year. However, these differences are not statistically significant. The difference in ACARs between parent and subsidiary firm with positive and negative two-years post transaction returns are significant on the 90% confidence level.

5.4.8.2   Relative Valuation Timing

Relatively low valued parents (measured by price multiples) exhibit higher ACARs when announcing spin-offs or carve-outs (Table 30). The ACAR in the window from t-3 to t+3 for all transactions with price-to-book ratios below the median in the year before the transaction have ACARs of 3.8%, which is significantly more than the 1.4% of transaction with price-to-book ratios higher than the median. This effect that low-valued parent firms have higher ACARs than high valued parent firms is not only significant based on price-to-book ratios, but also based on price-to-earnings and price-to-sales ratios.

Table 30: Announcement: ACARs Depending on Price Multiples

		Parent			Subsidiary	
		T-1	T+1	T+3	T+1	T+3
P/B	Difference	2.4**	1.9**	2.3**	-0.1	1.0
	Smaller than median	3.8***	3.1***	3.7***	2.8***	2.9***
	Larger than median	1.4***	1.2**	1.4**	2.9***	1.8***
P/E	Difference	1.8*	1.2	1.4	-0.6	-0.3
	Smaller than median	3.3***	2.7***	3.2***	2.3***	2.0***
	Larger than median	1.5***	1.5***	1.7***	2.9***	2.4***
P/S	Difference	2.5**	2.1**	1.6	0.2	0.5
	Smaller than median	3.7***	3.1***	3.3***	2.8***	2.4***
	Larger than median	1.2**	1.1**	1.7***	2.6***	1.9***

Average cumulative abnormal returns (ACARs) from t-3 to t+3 in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and T the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

The announcement effect does not differ significantly depending on the price multiples of subsidiary firms following the transaction. There is no clear trend whether the announcement effect is larger for lower or higher valued subsidiaries based on the price multiples investigated.

5.4.8.3   Operating Performance Timing

Less profitable parent firms in the year following the transaction (in terms of EBIT and earnings margin) have significantly higher ACARs upon the announcement of transactions than more profitable parent firms. The ACARs of parent firms with a relatively lower EBIT (earnings) margin in year t+1 are 3.6% (2.7%), which is significantly different from the ACARs of the more profitable parent firms with 0.9% (1.2%). The profitability of the subsidiary in t+1 und t+3 has no significant influence on announcement ACARs. However, it seems that the announcement effect is larger for less profitable subsidiaries.

Table 31: Announcement: ACARs Depending on Profitability and Leverage

		Parent			Subsidiary	
		T-1	T+1	T+3	T+1	T+3
Earnings/ Revenues	**Difference**	**0.5**	**1.5***	**0.4**	**0.5**	**0.0**
	Smaller than median	2.6***	2.7***	2.7***	2.8***	2.5***
	Larger than median	2.1***	1.2***	2.4***	2.3***	2.5***
EBIT/ Revenues	**Difference**	**0.3**	**2.7***	**1.7**	**-0.3**	**0.8**
	Smaller than median	2.5***	3.6***	3.5***	2.5***	2.9**
	Larger than median	2.2***	0.9**	1.8***	2.8***	2.1***
Earnings/ Assets	**Difference**	**0.3**	**1.3**	**-0.6**	**0.4**	**0.1**
	Smaller than median	2.6***	2.7***	2.3***	2.9***	2.7**
	Larger than median	2.3***	1.3***	2.9***	2.5***	2.6***
Debt/ Assets	**Difference**	**0.4**	**-0.3**	**1.6**	**-0.1**	**1.6**
	Smaller than median	2.8***	2.0***	3.3***	2.3***	2.4***
	Larger than median	2.4***	2.3***	1.7***	2.4***	0.8

Average cumulative abnormal returns (ACARs) from t-3 to t+3 in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and T the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

Parent firms, whose earnings grow from T+1 to T+3 more than the median, show significantly higher ACARs than lower growing firms. The difference of 1.7% in ACARs (2.6% compared to 0.9%) is significant on the 90% level using the two-sample t-test. The differences in earnings growth of parent firms before the transaction and subsidiary firms following the transaction have no significant effect on the ACARs. The same is true for the revenues growth: There is no impact of the differences in revenues growth on announcement ACARs.

Table 32: Announcement: ACARs Depending on Earnings and Revenues CAGRs

		Parent				Subsidiary	
		From T-5 to T-2	From T-2 to T	From T+1 to T+3	From T+3 to T+5	From T+1 to T+3	From T+3 to T+5
Earnings growth	**Difference**	**0.4**	**-0.2**	**-1.7***	**-1.1**	**0.1**	**-0.8**
	Smaller than median	2.5***	2.2***	0.9***	1.3***	1.8***	1.7***
	Larger than median	2.1***	2.4***	2.6***	2.4***	1.7***	2.5**
Revenues growth	**Difference**	**1.8**	**-0.2**	**0.2**	**-0.2**	**0.4**	**0.4**
	Smaller than median	3.2***	1.9***	2.6*	2.5*	2.7**	2.5
	Larger than median	1.3***	2.1***	2.4***	2.6***	2.3**	2.1***

Average cumulative abnormal returns (ACARs) from t-3 to t+3 in %; based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); t denotes the announcement date and T the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ACARs and the two sample t-test for the difference in ACARs.

5.4.8.4   Financing Needs

Financing needs do not have substantial influence on announcement ACARs. Neither the differences in indebtedness of parents or subsidiaries (Table 30) nor the differences in price multiples (as a measure of financing needs due to high investment requirements based on high growth expectations) of subsidiary firms (Table 31) have a significant effect on ACARs. Hence, the market does not differentiate at the announcement whether firms have large financing needs or not.

5.4.9   Cross Sectional Regressions

In this Section, results from univariate and multivariate regressions of the CARs are presented. The regressions serve two purposes: first, the univariate regressions provide an alternative to the difference of means tests by assuming that the sub-sample variances are equal and secondly, the multivariate regressions test whether the many cross-sectional determinants of CARs remain significant in the presence of each other.

The cross-sectional analysis is conducted by running simple OLS regressions of the CARs from t-3 to t+3 on a set of explanatory variables (X):

$$CAR_i = \alpha_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \varepsilon_i$$

To assess the impact of the place where the transactions occur (European vs. US transactions) and the related level of shareholder protection on the announcement effect, REGION and ANTIDIR are used. In line with "H2" no significant differences are expected. SIZE measures the impact of the relative deal value, measured as deal value divided by the parent market capitalization at the transaction date. "H9a" states that the value creation in the short run is higher in transactions, where the value of the transaction is relatively large. The differences in CARs between industrial and geographical focus increasing transactions are covered by INDFOCUS ("H5") and GEOFOCUS ("H6"). COMPLETED differentiates whether announced transactions subsequently got completed or not. No significant differences between completed and still pending or withdrawn transactions is expected as it is assumed that the market cannot anticipate it. INDEP ("H8") differentiates the CARs of transactions leading to independent subsidiaries (spin-offs and carve-outs with free float larger than 75%) as compared to the CARs of transactions with still dependent subsidiaries two years following the event (other carve-outs). PAR_PRE_RETURN, PAR_POST_RETURN and SUB_POST_RETURN

are the three stock market timing factors. It is expected that the market is too optimistic about announcements of firms that had high recent stock market returns and that the market does not properly anticipate the future stock market performance. PAR_PRE_PB, PAR_PRE_PE and PAR_PRE_PS are relative valuation measures of the parent firm in the year before the transaction. PAR_POST_EBIT_MAR and PAR_POST_EAR_MAR are profitability measures of the parent firm in the year following the transaction and PAR_POST_EAR_GR is the earnings growth measure. No significant differences in the announcement effect between relatively high- and low-valued parent firms and more or less profitable parent firms are expected.

Table 33: Announcement: Explanatory Variables for Cross Sectional Analysis

Regressor (X)	Definition	Construction	Expected Sign
REGION	European transactions (0) vs. US transactions (1)	Dummy	=
ANTIDIR	Level of Anti-director rights in the country of the parent company; ranging from low (1) to high (5)	1 to 5	=
SIZE	Deal value as % of parent market capitalization at the transaction date T	%	+
INDFOCUS	Parent and subsidiary belong to the same (0) or to different industries (1) based on the two-digit SIC code	Dummy	+
GEOFOCUS	Parent and subsidiary are from the same country (0) or from different countries (1)	Dummy	+
COMPLETED	Transactions that got subsequently completed (1) or not completed (0)	Dummy	=
INDEP	Transactions leading to independent subsidiaries (spin-offs and carve-outs with free float larger than 75%;1) as compared to the CARs of transactions with still dependent subsidiaries two years following the event (other carve-outs;0)	Dummy	+
PAR_PRE_RETURN	Parent firm's stock market return in the two years before the transaction	%	+
PAR_POST_RETURN	Parent firm's stock market return in the two years following the transaction	%	–
SUB_POST_RETURN	Subsidiary firm's stock market return in the two years following the transaction	%	–
PAR_PRE_PB	Parent firm's price-to-book ratio in T-1	%	=
PAR_PRE_PE	Parent firm's price-to-earnings ratio in T-1	%	=
PAR_PRE_PS	Parent firm's price-to-sales ratio in T-1	%	=
PAR_POST_EBIT_MAR	Parent firm's EBIT margin in T+1: Smaller than median (0) or larger than median (1)	Dummy	=
PAR_POST_EAR_MAR	Parent firm's earnings margin in T+1: Smaller than median (0) or larger than median (1)	Dummy	=
PAR_POST_EAR_GR	Parent firm's earnings growth from T+1 to T+3: Smaller than median (0) or larger than median (1)	Dummy	=

T denotes the execution date and t the announcement date.

5.4.9.1   Univariate Regressions

The results obtained by regressing the CARs from t-3 to t+3 on the alternative regressors for the 772 spin-offs and 355 carve-outs separately are reported in Table 34.

Table 34: Announcement: Univariate Analysis on CARs

| Regressor (X) | Spin-offs | | | | Carve-outs | | | |
	Intercept: α	Sensitivity: β	R^2	# of trx	Intercept: α	Sensitivity: β	R^2	# of trx
REGION	1.96**	1.16	0.05%	772	3.03***	-1.30	0.19%	354
ANTIDIR	0.97	0.36	0.05%	767	3.19	-0.26	0.07%	352
SIZE	1.73***	0.63***	2.36%***	328	1.79**	1.82	0.19%	242
INDFOCUS	1.12	2.67**	0.59%**	739	-0.09	3.18**	1.84%**	322
GEOFOCUS	1.97***	-1.86	0.09%	709	2.03***	-0.98	0.03%	312
COMPLETED	3.00**	-0.56	0.03	772	1.79	0.24	0.00%	354
INDEP	n/a	n/a	n/a	n/a	3.21***	-3.07**	1.34%	200
PAR_PRE_RETURN	2.60***	0.81	0.57%	329	1.32	1.78*	1.76%	151
PAR_POST_RETURN	2.01***	0.53***	1.70%**	353	3.32***	-0.76**	1.67%	241
SUB_POST_RETURN	2.64***	0.00	0.00%	219	2.92***	-1.09	1.39%	184
PAR_PRE_PB	2.90***	-0.10	0.21%	372	3.03**	0.00	0.03%	219
PAR_PRE_PE	2.63	0.00	0.00%	458	2.20***	0.02	2.53%*	290
PAR_PRE_PS	3.59***	-0.45***	1.63%***	454	2.06***	-0.01	0.80%	290
PAR_POST_EBIT_MAR	2.69**	-1.37	0.43%	324	4.39***	-4.31***	3.22%***	203
PAR_POST_EAR_MAR	2.07**	-0.63	0.10%	373	3.25**	-2.47*	1.14%*	235
PAR_POST_EAR_GR	1.38*	1.82	0.83%	238	0.77	-0.23	0.02%	141

Regression coefficients of OLS regressions for the cumulative abnormal returns (CARs) from t-3 to t+3 on a set of explanatory variables (see Table 33); based a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level based on White heteroscedasticity-adjusted standard errors using a t-test for α and β; asterisks next to the R^2 values denote significance of the F-test.

The estimated sensitivity coefficients (column 3) for spin-offs represent clear evidence that industrial focus increasing, larger transactions with positive returns in the two years subsequent to the transaction and relatively low price-to-sales ratios have higher abnormal returns upon the announcement of spin-offs. The coefficients of these four regressors are at least on a 95% statistical significance level different from zero for the 7 days event window. This indicates a mean difference between the two sub-samples. The sensitivity is highest for INDFOCUS (2.7%) and the R^2 is highest for SIZE (2.4%). The return of the parent firm in the two years before the transaction (PAR_PRE_RETURN) and the parents' earnings growth in the year after the transaction (PAR_POST_EAR_GR) show positive but not statistically significant coefficients. PAR_POST_EAR_MAR and PAR_POST_EBIT_MAR, in contrast, have negative, not-

statistically significant coefficients. REGION, ANTIDIR, GEOFOCUS, COMPLETED, SUB_POST_RETURN, PAR_PRE_PB and PAR_PRE_PE seem to have no substantial influence on the short-term abnormal returns, as the sensitivity coefficients as well as the R^2 are small and not significant.

For carve-outs, the sensitivity of the announcement effect, as shown in column 7, is biggest for industrial focus increasing, low profitable firms that have positive pre-transaction and negative post-transaction returns and that remain dependent in the subsequent two years. The announcement CARs also seem to be higher for larger transactions and for transactions where subsidiaries have negative post transaction returns. The influence of these factors on the CARs, however, is not significant. The EBIT margin of the parent firms in the year following the transaction is the factor with the most explanatory power with an R^2 of 3.2% and with the largest sensitivity of –4.3%. Stock market timing has an important role in carve-outs. This is confirmed as the announcement effect is larger the higher the pre-transaction (PAR_PRE_RETURN with 1.8%) and the lower the post-transaction returns (PAR_POST_RETURN with –0.8% and SUB_POST_RETURN with –1.1%).

INDFOCUS is the factor with the strongest influence on the CARs of both, spin-offs and carve-outs. The sensitivity of carve-outs CARs is, with 3.2%, slightly higher than the one of spin-off CARs with 2.7%; both are significant on the 95% level. The impact of the parent return in the two years following the transaction (PAR_POST_RETURN) on CARs is mixed: While it has a positive influence on spin-offs CARs (0.5%, significant on the 99% level), it has a negative one on carve-out CARs (-0.8%, significant on the 95% level). SIZE and PAR_PRE_RETURN have a positive influence on the CARs of both transaction types, though only significant for one type. The finding that less profitable parent firms, measured either by the EBIT or the earnings margin, exhibit a higher announcement effect is supported by both spin-offs and carve-outs.

5.4.9.2   Multivariate Regressions

The intercepts of the multivariate OLS regressions show the positive effects of both spin-offs and carve-outs (Table 35). SIZE is the key driver for the announcements effect of spin-offs. For carve-outs, the findings of the univariate regressions are confirmed; PAR_POST_EBIT_MAR and INDFOCUS are the key drivers for the announcement effect.

Table 35: Announcement: Multivariate Analysis on CARs

	Spin-offs				Carve-outs			
Intercept	0.72	1.24**	0.52	0.44	1.36	1.35	6.28***	4.28***
REGION	-0.50				2.47			
ANTIDIR	0.03				-0.95			
SIZE	0.65**	1.15***	1.68***	2.00***	0.01			
INDFOCUS	1.44				3.78**	4.27***		3.03*
GEOFOCUS	1.79				0.53			
INDEP					-0.81			
PAR_POST_RETURN		-0.06		-0.42			-0.70**	-0.56*
SUB_POST_RETURN			0.23	0.28				
PAR_PRE_PE								-0.04
PAR_POST_EBIT_MAR						-4.22***	-6.36**	-5.97***
Number of transactions	317	257	183	170	150	195	176	159
Adjusted R²	**3.07****	**8.56***	**9.30***	**10.35***	**0.76**	**5.27***	**7.76***	**17.36***
F-statistic	3.00	13.0	9.2	7.5	1.2	6.4	8.4	9.3

Regression coefficients of OLS regressions for the cumulative abnormal returns (CARs) from t-3 to t+3 on a set of explanatory variables (see Table 33); based on a sample of 772 spin-offs and 355 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; US (European) transactions adjusted for the SP500 (DJ STOXX); asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level based on White heteroscedasticity-adjusted standard errors using a t-test for α and β; asterisks next to the adjusted R^2 values denote significance of the F-test.

Combining SIZE with PAR_POST_RETURN and with SUB_POST_RETURN increases the explanatory power for the announcement CARs of spin-offs to 8.6% resp. 9.3%.[178]   The three-factor regression with SIZE, PAR_POST_RETURN and SUB_POST_RETURN shows the strong influence of SIZE and increases the adjusted R^2 to 10.4%.[179]   For carve-outs, the explanatory power is higher by combining PAR_POST_EBIT_MAR, the factor with strongest influence in the univariate analysis, with INDFOCUS (5.3%)and PAR_POST_RETURN (7.8%). The four-factor regression

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[178] Desai and Jain (1999) find based on 88 spin-offs an adjusted R^2 of 7.8% by regressing change in industrial focus as well as change in operating performance on the announcement period abnormal returns. In a multiple linear regression model, adjusted R^2 measures the proportion of the variation in the dependent variable accounted for by the explanatory variable(s). Using R^2s, the residual sum of squares decreases or remains the same as new explanatory variables are added. By applying adjusted R^2s, this is not the case. For this reason, adjusted R^2s are generally considered to be more accurate to assess the suitability than R^2s.

[179] The highest adjusted R^2 can be achieved by increasing the number of factors. The adjusted R^2 of the ten-factor regression for spin-offs are 55.9% and 34.5% for carve-outs. However, the coefficients can become partially very high and lose their economic rationale.

with these regressors confirms the super influence of PAR_POST_EBIT_MAR and INDFOCUS and increases the explanatory power to 17.4%.

5.4.10   Summary and Appraisal of Results

Based on the sample of 772 spin-offs and 355 carve-outs, one finds a very robust and positive market revaluation of firms announcing a transaction of either type. The positive effect is consistent with the evidence of other studies and also confirms these studies in terms of economical importance. The value creation in the event window from t-10 to t+10 for carve-outs is 2.3% and 2.8% for spin-offs. It is significant on the 99% level for both types of transaction. The longer the event window starts before the announcement date, the higher and more significant the average cumulative abnormal returns (ACARs). The empirical evidence shows that the value creation at the announcement date itself is 0.3% for carve-outs and 1.4% for spin-offs. Spin-offs and carve-outs also generate positive average CARs in event windows after the announcement date.

Separately analyzing the effect for each year shows that since 1999, the announcement effect for carve-outs has become smaller, while the effect for spin-offs has increased in the last three years of the sample. In the 14 years analyzed, the announcement effect of US transactions is more stable than the cyclical European effect. Key factors explaining the different extent of the announcement effect for spin-offs are the relative size, the post transaction return of the parent and the post transaction return of the subsidiary firm. For carve-outs, the profitability of the parent firm as measured by the EBIT margin and industrial focus, are the key factors.

Figure 11: Announcement: Overview on Hypotheses Tested

Hypothesis tested empirically:
- ▨ Strong support (not rejected)
- ▨ Medium support
- ☐ Low/no support (rejected)

S: Spin-offs
C: Carve-outs

		Hypothesis		Operationalization	Announce-ment Effect
Type of transaction	H1	Spin-offs create more value than carve-outs	H1a	Spin-offs increase the firm value in the short-run more than carve-outs	▨
			H1b	European spin-offs increase the firm value in the short-run more than European carve-outs	☐
			H1c	US spin-offs increase the firm value in the short -run more than US carve-outs	▨
Place of transaction	H2	The value creation of spin-offs and carve-outs is similar in Europe and in the USA	H2a	European transactions increase the firm value in the short-run similarly as US transactions	▨
			H2b	European spin-offs increase the firm value in the short-run similar to US spin-offs	▨
			H2c	European carve-outs increase the firm value in the short-run similar to US carve-outs	▨
			H2d	The value creation of spin-offs and carve-outs in the short-run does not differ significantly depending on the origin of law and/or the level of shareholder protection	▨
Pillar 1: **Strategic Business Portfolio Restruc-turing**	H5	Industrial Focus	H5	Firms involved in spin-offs and carve-outs that improve the industrial focus increase the firm value in the short-run more than firms involved in not industrial focus increasing transactions	S C
	H6	Geographical Focus	H6	Firms involved in spin-offs and carve-outs that improve the geographical focus increase the firm value in the short-run more than firms involved in not geographical focus increasing transactions	S C
	H8	Independence of Subsidiary	H8	Subsidiary firms resulting from spin-offs or from carve-outs with a high free float increase the firm value in the short-run more than subsidiary firms depending on other firms	☐
	H9	Relative Size of Transaction	H9a	The value creation in the short run is higher in transactions, where the value of the subsidiary company is relatively large as compared to the value of the parent company	S C

The evidence on whether spin-offs create more value than carve-outs is mixed. "H1a" and "H1c" are supported by the significant differences in median cumulative abnormal returns (MCARs) between spin-offs and carve-outs in the US. However, differences in ACARs are not statistically different from zero. "H1b", that claims a different value creation in the short-run of European spin-offs and European carve-outs, is rejected based on ACARs as well as on MCARs. The evidence in this study supports the hypothesis "H2", that the value creation of European and US spin-offs and carve-outs is similar. The announcement effect of European and US carve-outs does not differ significantly and the level of shareholder protection has no influence on the end result. Hence "H2c" and "H2d" are validated, while the evidence on "H2a" and "H2b" is mixed: US transactions seem to have higher abnormal returns around the announcement than European transactions.

The Industrial Focus Hypothesis "H5" and the Relative Size of Transaction Hypothesis "H9" are supported: Market participants prefer industrial focus increasing and relatively large transactions at the announcement date. The Geographical Focus Hypothesis "H6" is denied as cross boarder transactions do not cause different abnormal returns than domestic transactions. The Independence of Subsidiary Hypothesis "H8", that spin-offs and carve-outs with a free float larger than 75% create more value in the short-run than carve-outs (where the subsidiary remains dependent on the contrary) is rejected as well. Some spin-offs have larger abnormal returns around the announcement than carve-outs, but within carve-outs, those transactions leading to independent subsidiaries do not have a higher announcement effect.

Average as well as median CARs of transactions in event windows after the announcement date are significantly positive. Hence, one can conclude that a substantial part of the information processing and also the value creation occurs in the days after the announcement day. Based on this empirical evidence, announcements of spin-offs and carve-outs offer attractive short-term investment opportunities; there is limited inefficiency on the capital market that can be profitably exploited by merely reacting to announcements without having insider information or reacting to rumors. For the companies themselves, spin-offs and carve-outs offer a way to increase the market capitalization of the company in the short-term. The empirical analysis in Sections 5.5 to 5.7 has to provide the answer of whether this is simply the result of management's market timing capabilities by "selling" subsidiaries in a positive stock market environment, or whether these transactions truly create long-term value for the shareholders.

5.5   Long-term Stock Market Effects

Section 5.5 measures whether spin-off and carve-outs firms are able to create abnormal value on the stock market beyond the one created upon the announcement as documented in Section 5.4. In Figure 12, a plot of equally weighted abnormal return indexes of all spin-offs and carve-outs is depicted for the four year subsequent to the completion date. Calculations are based on a sample of 1202 events for which proper data is available. Obviously, the announcement effect does not cover the entire abnormal value creation of spin-offs and carve-outs. Parent as well as subsidiary firms resulting from spin-offs perform better than the stock market in the long run. In carve-outs, in contrast, subsidiaries perform more or less in line with the stock market, while parent firms substantially underperform. In both transaction types, subsidiary firms perform better than their former parent firms do.

Figure 12: Long-term Stock Market: Abnormal Returns
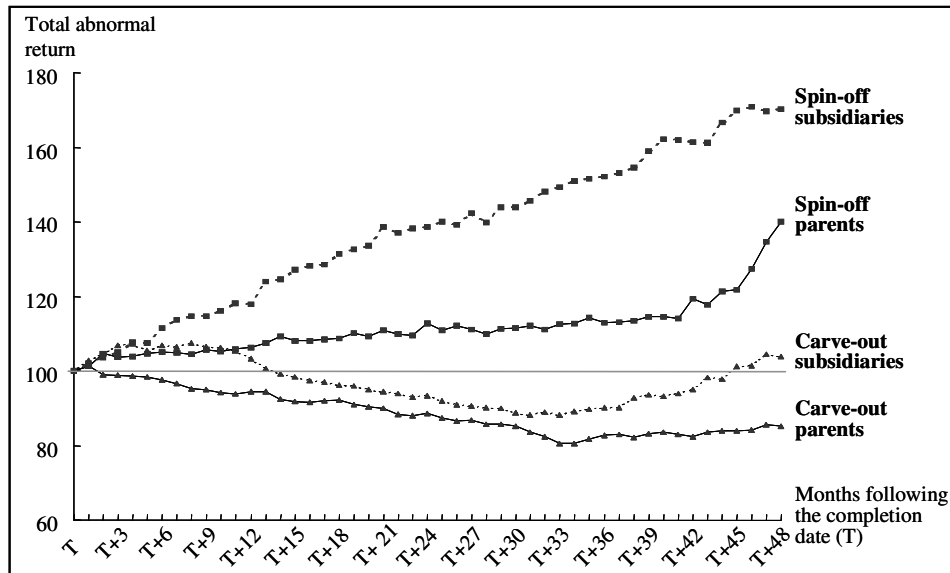
Equally weighted abnormal return indexes (equivalent to CAARs) for the 4 years following the completion date, based on a sample of 563 spin-offs and 639 carve-outs occurring in the USA and Europe between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX), T denotes the execution date.

Table 36 shows that both parents as well as subsidiary firms resulting from spin-offs outperform the market subsequent to the transaction. The positive abnormal return of spun-off subsidiaries is highly statistically significant in the three years following to the event. Subsidiaries outperform their benchmark in the first year by 18.9%, in the two years by 30.9% and in the three years by 55.8%. This effect is valid in the USA as well as in Europe. Parent spin-off firms also show superior long-term post-transaction performance, though only significant for European parent firms from T to T+2 with 12.6% and from T to T+4 with 21.0%, both significant on the 90% level. Parents and subsidiaries resulting from carve-outs, on the contrary, substantially and significantly underperform in the years following the transaction. The ABHARs of parents are –8.8%, -11.8%, -34.3% and –40.4% for the overlapping one, two, three and four years periods.

Table 36: Long-term Stock Market: Average BHARs of Spin-offs and Carve-outs

	Parent				Subsidiary			
	T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	**7.7**	**17.3**	**15.9**	**23.5**	**18.9*****	**30.9*****	**55.8****	**74.2**
	(435)	(382)	(330)	(258)	(336)	(281)	(229)	(162)
EU spin-offs	-4.2	12.6*	12.2	21.0*	2.0	28.6**	53.8**	56.0
	(127)	(125)	(117)	(92)	(88)	(86)	(80)	(60)
US spin-offs	12.6	19.6	18.0	24.9	24.9*	31.9***	56.8	84.9
	(308)	(257)	(213)	(166)	(248)	(195)	(149)	(102)
Carve-outs	**-8.8*****	**-11.8**	**-34.3*****	**-40.4*****	**8.2*****	**-7.9***	**-17.2****	**-14.7**
	(373)	(334)	(296)	(270)	(496)	(443)	(386)	(336)
EU carve-outs	-2.6	-10.1**	-17.6***	-6.6	25.6***	-14.2**	-22.1**	0.5***
	(113)	(113)	(104)	(102)	(84)	(84)	(83)	(82)
US carve-outs	-11.5***	-12.6	-43.3***	-61.0***	4.6	-6.4	-15.9*	-19.6
	(260)	(221)	(192)	(168)	(412)	(359)	(303)	(254)
H1a Difference spin-offs and carve-outs	**16.5***	**29.1**	**50.2****	**63.9***	**10.7**	**38.8*****	**73.0*****	**88.8****
H1b Difference EU spin-offs and EU carve-outs	-1.5	22.7**	29.8**	27.6*	-23.6*	42.8***	75.9***	55.5*
H1c Difference US spin-offs and US carve-outs	24.1*	32.2	61.3**	85.9	20.3**	38.3**	72.7*	104.4*
H2a Difference EU trx and US trx	**-5.0**	**-2.8**	**9.2**	**24.8**	**1.2**	**0.3**	**7.1**	**13.6**
H2b Difference EU spin-offs and US spin-offs	-16.7	-7.0	-5.8	-3.9	-23.0	-3.4	-3.0	-28.9
H2c Difference EU carve-outs and US carve-outs	8.8	2.6	25.7***	54.4***	21.0*	-7.9	-6.2	20.0

Average buy and hold abnormal returns (ABHARs) in % and in brackets number of transactions; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

Carve-out subsidiaries exhibit a significantly positive outperformance of 8.2% in the first year. This effect is robust, as it appears not only in the USA with 4.6%, but also in Europe with 25.6% significant on the 99% level. This positive effect in the first year, may be influenced by the support of the lead underwriter of the IPO and the lockup period, whereby insiders are prohibited from selling shares. Nearly all IPOs feature lockup agreements that means commitments by insiders of stock-issuing firms to abstain from selling shares for a specified period of time after the issue, usually six months (Cao, Field, and Hanka, 2004). The lockup agreement is negotiated between the investment bank and the insiders of the issuing firm i.e., the parent firm and not required by law. Bradley et al. (2001) and Brav and Gompers (2003) show that in the week when the lockup of former IPO firms expires, share prices fall about 2%.[180] The inferior performance of carve-outs subsidiaries starts in the second year. The performance declines substantially, leading to negative abnormal returns of –7.9%, -17.2% and –14.7% in the two-, three- and four-year intervals.

5.5.1   Type of Transaction: Spin-offs vs. Carve-outs

Differentiating spin-offs and carve-outs shows that their long-term stock market value creation differs substantially and significantly. Parents as well as subsidiaries that result from spin-offs exhibit positive ABHARs, while both carve-out parents and subsidiaries have significantly negative ABHARs. The difference in subsidiaries is 10.7%, 38.8%, 73.0% and 88.8% for the one-, two-, three- and four-year periods starting with the execution date. The respective differences for parent firms are 16.5% 29.1%, 50.2% and 63.9%. All these differences are significant apart from the two-year parent and the one-year subsidiary period. For example, in the two-years period subsequent to the transaction, parents (subsidiaries) of spin-offs not only have higher ABHARs of 17.3% (30.9%) compared to –11.8% (-7.9%) of carve-outs, but also a higher median of –12.2% (-11.3%), as compared to –24.0% (-34.0%), a higher first quartile of –53.4% (-52.6%), as compared to –56.7% (-68.8%) and a substantially higher third quartile of 28.1% (40.3%) compared to 4.8% (22.7%).

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[180] Brav and Gompers (2003) document that lookups can be seen as a commitment device to alleviate moral hazard problems. Insiders of firms that are associated with greater potential for moral hazard lock-up their shares for a longer period of time.

Figure 13: Long-term Stock Market: Histogram of BHARs
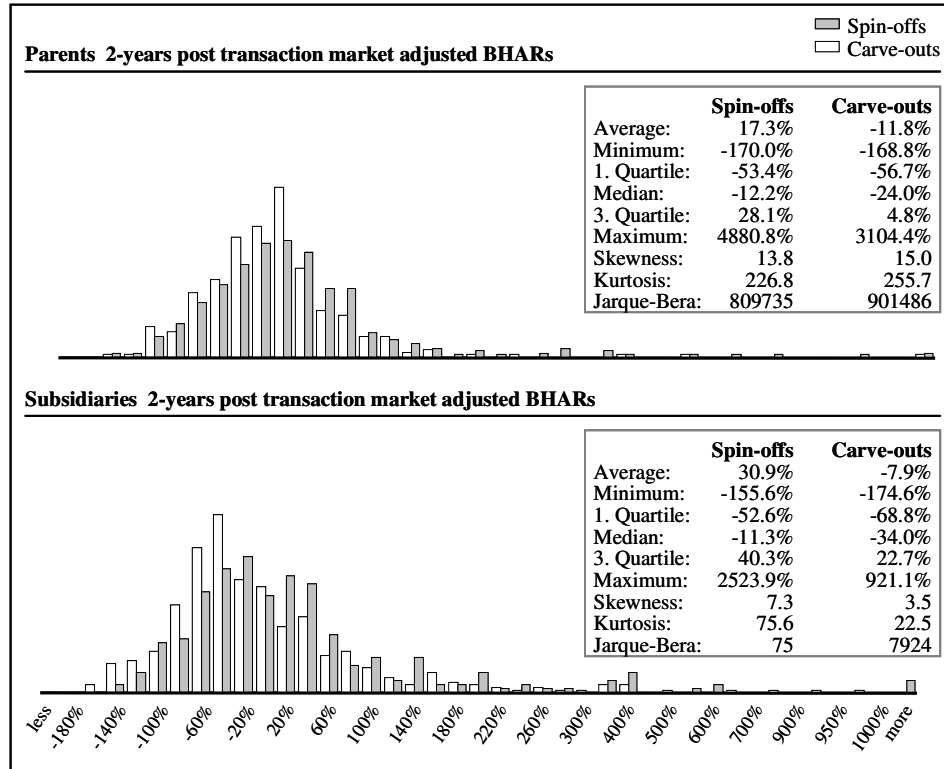
Looking at the distribution of the 2-year post transaction BHARs of parents and subsidiaries (Figure 13) shows that the distributions of BHARs have long right tails, are peaked and hence the Jarque-Bera test statistic leads to the rejection of the null hypothesis of normal distributions. Parents of spin-offs as well as of carve-outs have a higher skewness and kurtosis than their subsidiaries. The BHARs of carve-outs and spin-offs have a similar skewness and kurtosis, thus making the distributions comparable. However, as the BHARs are not normally distributed, it is worthwhile to compare the median buy and hold abnormal returns (MBHARs) as depicted in Table 37.

As a result of the heavily skewed distribution of BHARs, the MBHARs are substantially lower than ABHARs. In almost all periods, the median parent and subsidiary resulting from spin-offs and carve-outs underperform the market. This finding is consistent in the US as well as in Europe. Only the median of European parent firms conducting spin-

offs shows slightly positive three- and four year BHARs of 2.7% and 2.9%. However, "H1a" (that spin-offs create more value than carve-outs) is also supported by MBHARs: The difference between the median parent (subsidiary) spin-off and carve-out firm is 5.9% (4.7%), 11.8% (22.7%), 24.1 % (35.4%), and 30.5% (41.6%) in the four overlapping periods. All differences between MBHARs of spin-offs and carve-outs are statistically significant apart for the subsidiary from T to T+1. "H1b" and "H1c" are also supported, as the MBHARs of spin-off firms are substantially, and for most event windows, also significantly higher than those of carve-out firms in both the USA and Europe.

Table 37: Long-term Stock Market: Median BHARs of Spin-offs and Carve-outs

	Parent				Subsidiary			
	T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	**-8.5***	**-12.2***	**-18.6***	**-20.9***	**-6.2**	**-11.3**	**-18.0**	**-19.3**
	(41.8)	(40.8)	(41.8)	(39.5)	(45.2)	(45.9)	(40.6)	(43.2)
EU spin-offs	-5.1**	-4.4	2.7	2.9	-15.9**	-5.9	-0.4	24.7**
	(45.7)	(47.2)	(50.4)	(52.2)	(37.5)	(48.8)	(50.0)	(56.7)
US spin-offs	-9.0***	-23.3***	-33.6***	-50.9***	-2.2	-13.1	-32.1***	-62.1**
	(40.3)	(37.7)	(37.1)	(32.5)	(48.0)	(44.6)	(35.6)	(35.3)
Carve-outs	**-14.4***	**-24.0***	**-42.7***	**-51.3***	**-10.9***	**-34.0***	**-53.4***	**-60.9***
	(33.2)	(28.1)	(29.7)	(29.3)	(40.9)	(32.1)	(28.5)	(26.5)
EU carve-outs	-13.0***	-18.0***	-31.1***	-24.2***	-13.1	-33.8***	-38.9***	-46.9***
	(35.4)	(31.0)	(32.7)	(35.3)	(38.1)	(29.8)	(21.7)	(28.0)
US carve-outs	-14.4***	-26.5***	-54.0***	-84.9***	-10.2**	-35.1***	-57.9***	-89.3***
	(32.3)	(26.7)	(28.1)	(25.6)	(41.5)	(32.6)	(30.4)	(26.0)
H1a Difference spin-offs and carve-outs	**5.9***	**11.8***	**24.1***	**30.5***	**4.7**	**22.7***	**35.4***	**41.6***
H1b Difference EU spin-offs and EU carve-outs	7.9	13.6**	33.8***	27.1*	-2.8	27.9***	38.5***	71.6***
H1c Difference US spin-offs and US carve-outs	5.5*	3.2*	20.4**	33.9**	7.9**	22.0***	25.8*	27.2
H2a Difference EU trx and US trx	**0.6**	**15.2***	**32.8***	**59.2***	**-6.8**	**7.7***	**24.0***	**56.5***
H2b Difference EU spin-offs and US spin-offs	3.9	18.9***	36.3***	53.8***	-13.6*	7.2	31.7***	86.8***
H2c Difference EU carve-outs and US carve-outs	1.4	8.5**	22.9***	60.7***	-2.9	1.3	19.0**	42.4***

Median buy and hold abnormal returns (MBHARs) in % and in brackets share of positive transactions; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test for MBHARs and the two sample Mann-Whitney test for the difference in MBHARs.

In summary, there is striking evidence to support the overall hypothesis "H1", that spin-offs on average create more and on median destroy less value than carve-outs. "H1a", "H1b" and "H1c" are supported by the significant differences in ABHARs and MBHARs between spin-offs and carve-outs in the USA and in Europe.

5.5.2 Place of Transaction: European vs. US Transactions

The results in Table 36 indicate that there is no significant difference between the long-term value creation of spin-offs and carve-outs in the USA and in Europe. While US parent firms perform better in the first two years, European parent firms perform better in the subsequent two years. However, these differences are not statistically significant. The non-statistically significant differences between European and US subsidiaries in the four overlapping periods investigated are 1.2%, 0.3%, 7.1% and 13.6%. Differentiating the long-term stock market abnormal performance of spin-offs and carve-outs on the two continents shows that US parent and subsidiary firms have higher ABHARs than European spin-off firms. In contrast, European carve-outs don't perform quite so poorly as US carve-outs do. From T to T+3 and from T to T+4, the difference of 25.7% and 54.4% between European and US carve-out parent firms is even significant on the 99% level.

The long-term abnormal returns of US spin-off and carve-out firms are more heavily skewed than the ones of European firms. As a result, European spin-off and carve-out parents and subsidiaries have substantially higher MBHARs than their US counterparts. The mostly significant differences in MBHARs between European and US spin-off (carve-out) firms are 3.9% (1.4%), 18.9% (8.5%), 36.3% (22.9%) and 53.8% (60.7%) for parents and −13.6% (-2.9%), 7.2% (1.3%), 31.7% (19.0%) and 86.8% (42.4%) for subsidiaries. Hence the evidence on "H2", that the value creation of spin-offs and carve-outs is similar in Europe and in the USA, is mixed. Analyzing ABHARs and using a two-sample t-test shows no significant differences. However, the more relevant MBHARs (due to the skewed distribution) show that European firms perform significantly better than US firms (based on the two sample Mann-Whitney test).

Differentiating the long-term stock market effects of transactions in specific European countries shows that parents as well as subsidiaries resulting from carve-outs show negative long-term abnormal returns subsequent to the transaction. In nine out of the eleven countries investigated, there is a significant negative ABHAR for carve-out firms in at least one period. Only carve-outs in Switzerland have no significantly negative returns, though the sample taken into account is small (10). There are only three periods with significant positive abnormal returns in the eleven countries for the eight periods investigated. British and German subsidiaries have a significant positive outperformance in the year subsequent to the transaction and French parents have the same outcome in the

three-year period. Therefore, the finding that carve-out firms destroy value in the years following the transaction is also supported based on the analysis on European countries.

Table 38: Long-term Stock Market: Average BHARs in European Countries

Country	Transaction type	# of trx overall	# of trx for long-term stock	Parent			Subsidiary		
				T to T+1	T to T+2	T to T+3	T to T+1	T to T+2	T to T+3
United Kingdom	Carve-outs	44	21	-12.6***	-22.8***	-24.6***	28.0	-7.5	-9.1
	Spin-offs	99	52	-10.7**	16.2	26.4*	-14.8**	12.6	10.8
Germany	Carve-outs	44	30	-4.8	-24.9***	-31.4***	42.0***	-18.9*	-48.0***
	Spin-offs	22	7	-18.4***	-8.1	-23.6*	-24.5***	-8.2	7.8
Sweden	Carve-outs	9	6	-15.9**	-24.9***	-42.1***	-14.2*	-44.7***	-63.8***
	Spin-offs	40	21	-5.8	-0.8	-1.2	34.8**	78.2**	185.7**
Italy	Carve-outs	13	7	10.1	-22.0**	-48.6***	-40.6	-9.7	3.9
	Spin-offs	21	9	-18.5**	-24.4***	-25.3***	45.5	26.9	47.2**
Switzerland	Carve-outs	16	10	14.3	20.3	-18.4	27.4	39.0	13.9
	Spin-offs	13	6	3.6	2.5	3.1	69.4**	144.3**	205.2*
Norway	Carve-outs	5	1	-47.9	-74.2	-62.9	n/a	n/a	n/a
	Spin-offs	21	6	9.6	60.9	28.4	-40.0***	21.1	27.2
France	Carve-outs	27	18	-9.0*	8.5	23.2**	13.4	-18.4*	-15.1*
	Spin-offs	8	8	19.7*	33.7***	-0.9	17.1	25.3	24.7
Spain	Carve-outs	15	6	-4.0	-9.1	-18.7***	-22.5***	-2.7	22.2
	Spin-offs	4	0	n/a	n/a	n/a	n/a	n/a	n/a
Netherlands	Carve-outs	6	5	-15.2*	-51.0***	-54.9***	11.2	-22.8	30.8
	Spin-offs	12	7	-1.8	3.5	-49.2***	-16.4***	-1.1	18.9
Finland	Carve-outs	6	5	-22.3***	-7.1	-16.1	-39.0***	-38.2***	-77.3**
	Spin-offs	12	1	63.6	68.3	69.7	85.8	75.5	78.0
Belgium	Carve-outs	6	3	-22.0***	-25.8***	-12.2	137.4	382.5	-26.4
	Spin-offs	12	2	-33.4	-24.7	3.6	-30.1***	-26.2***	-9.6*

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 182 spin-offs and 175 carve-outs (whereof for 139 spin-offs and 135 carve-outs proper data is available) occurring between January 1990 and April 2003; only countries depicted with at least five transactions, US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs.

The evidence on the long-term abnormal performance of spin-offs in European countries is mixed. While there are periods with significantly positive abnormal return for spin-offs in the UK, Sweden, Italy, Switzerland and France, there are also significantly negative abnormal returns for spin-offs in the UK, Germany, Italy, Norway, Netherlands and Belgium. However, there are with Sweden, Switzerland, France and Finland more countries with substantial positive effects of spin-offs than countries with a substantial negative effect (only found in Germany). These transactions give indications to support

"H1b", that European spin-offs exhibit higher abnormal returns in the long run than European carve-outs.

The long-term abnormal stock returns of firms involved in spin-offs and carve-outs may depend on the countries' origin of the law and the related level of shareholder protection. The results depicted in Table 39 and Table 40 show that the influence of the origin of the law and the level of shareholder protection on the long-term stock market effects is unclear.

Table 39: Long-term Stock Market: Shareholder Protection Level

| Transaction type	Level of shareholder protection	# of trx for long-term stock	Parent				Subsidiary			
			T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Carve-outs	0/1	41	-3.6	-25.7***	-35.3***	-40.8***	40.8***	-7.8	-49.2***	-38.0*
	2	24	2.3	-20.0	-47.8***	-53.5***	25.1	-22.2	-30.3	-0.5
	3	37	-17.2***	-9.5	-2.8	31.4*	32.0	-9.6	24.8	103.7
	4	23	-15.3***	161.3*	-28.6*	-44.0***	-23.2***	-29.7***	-64.2***	-82.0***
	5	393	-9.9***	-22.9***	-38.5***	-51.3***	2.0	-4.8	-13.8*	-21.0*
Spin-offs	0/1	18	-19.3***	-17.3***	-22.7***	-17.1	15.4	7.6	26.1**	38.0**
	2	17	16.1***	8.7	-1.9	0.0	14.8	51.8*	93.4**	16.9
	3	31	1.5	8.6	1.2	11.6	29.6**	65.2***	132.0***	146.4***
	4	10	8.4	43.0	20.1	18.4	13.0	-0.8	2.3	13.9
	5	364	9.2*	19.8*	20.1	29.3	19.2***	30.3***	51.5**	79.4**

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs.

Carve-out parents and subsidiaries significantly underperform, regardless of the origin of law and the level of shareholder protection. Spin-offs, in contrast outperform significantly in all countries, no matter where their origin of the law. One can therefore conclude that the shareholder protection level and the origin of the law are not key drivers for the long-term abnormal stock market returns. Hence "H2d", that the value creation in the short-run is similar in countries with a low and a high level of shareholder protection, is supported.

Table 40: Long-term Stock Market: Origin of Law

Transaction type	Origin of Law	# of trx for long-term stock	Parent				Subsidiary			
			T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Carve-outs	German	47	-3.4	51.3	-30.1***	-36.9***	27.7**	-19.0*	-44.5***	-48.4***
	French	45	-7.6	-18.7***	-21.8**	-17.8	15.2	-19.4	-28.8*	10.6
	Scandinavian	13	-20.4***	-21.6***	-33.0**	11.7	-17.8***	-34.5***	-67.2***	-39.8**
	English	399	-10.4***	-22.5***	-37.6***	-49.5***	4.2	-3.6	-9.2	-10.1
Spin-offs	German	14	-2.6	0.7	1.6	18.2	67.4**	78.9*	120.6*	24.8
	French	24	-2.2	3.1	-20.5***	-31.5***	11.2	12.0	26.3**	26.4**
	Scandinavian	31	5.7	15.3	9.1	18.4	17.8	63.0**	138.4***	147.4***
	English	365	9.0	19.3*	19.9	29.1	18.8***	29.8***	50.0*	76.0*

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs.

5.5.3   Robustness

This Section intends to assess whether the above results are robust to alternative methodologies of calculating abnormal returns and alternative benchmarks for calculating the expected ("normal") returns, if they are robust if abstained from outliers and to give a year-by-year analysis.   A comparison of the 563 spin-offs and the 639 carve-outs leads to the finding that the results are robust. No matter which methodology for the calculation of abnormal and expected returns is used, spin-offs parents and subsidiaries create abnormal long-term value following the transaction.

5.5.3.1   Methodology

Abnormal returns following the completion of spin-offs and carve-outs are very similar using ABHARs, ACARs and CAARs. In the three years subsequent to the transaction, spin-off parents outperform the respective index by 15.9%, 19.7% and 12.9% and their subsidiaries by 55.8%, 31.7% and 52.0% using ABHARs, ACARs and CAARs. For carve-outs, the respective outperformance are -34.3%, -15.3% and -17.2% for parents -17.2%, -13.0% and -9.9% for subsidiaries. The effects are slightly smaller by using ACARs and CAARs as compared to the results by using ABHARs. Figure 14 shows the CAARs of spin-offs and carve-outs in Europe and the USA. By using CAARs the highly positive abnormal returns of spin-off subsidiaries are driven by US transactions. Carve-

out parent and subsidiary firms develop apart from the positive first year of subsidiaries very closely.

Figure 14: Long-term Stock Market: Abnormal Returns of European and US Spin-offs and Carve-outs
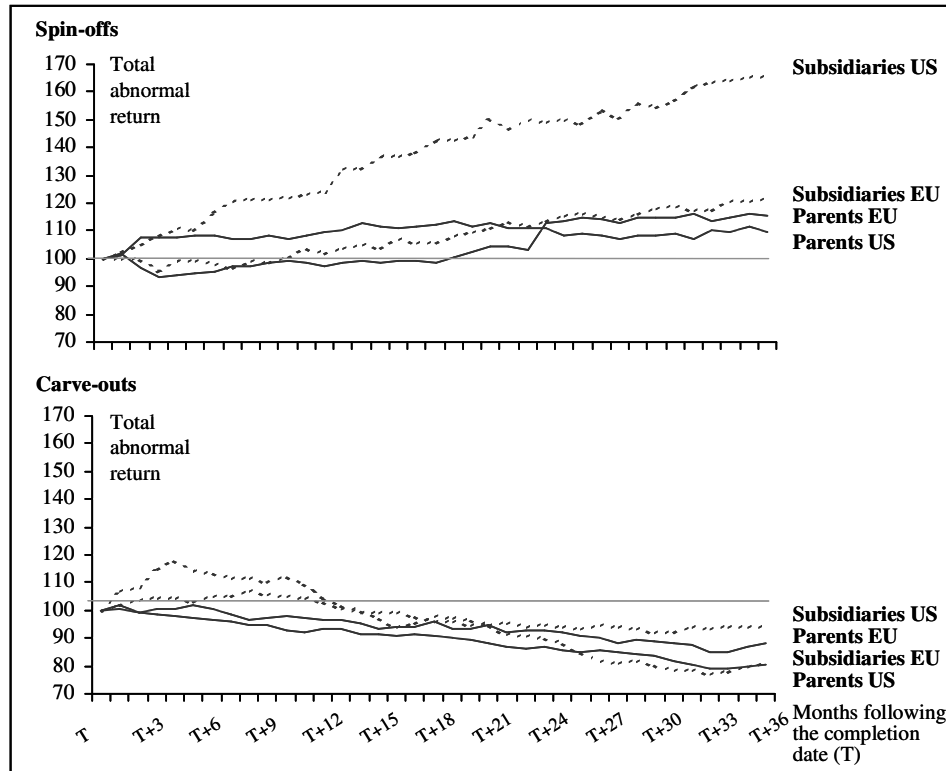
Equally weighted abnormal return indexes (equivalent to CAARs) for the 3 years following the completion date, based on a sample of 563 spin-offs and 639 carve-outs occurring in the USA and Europe between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX), T denotes the execution date.

The finding that spin-offs create abnormal value in the long run is very robust, as spin-off parents as well as subsidiaries have positive abnormal returns in all periods for all three methodologies. The finding that carve-out firms exhibit negative abnormal returns is as well founded in all three methodologies. Apart from the positive abnormal return of carved-out subsidiaries in the first year (as documented as well by BHARs), there are

ACARs from T to T+2 for parents and from T to T+4 for subsidiaries using CAARs with non-negative abnormal returns.

Table 41: Long-term Stock Market: ABHAR, ACAR and CAAR

Transaction type and place	Methodo-logy	Parent				Subsidiary			
		T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	**ABHARs**	**7.7**	**17.3**	**15.9**	**23.5**	**18.9*****	**30.9*****	**55.8****	**74.2**
	ACARs	**5.9**	**16.2**	**19.7**	**34.1**	**14.9****	**22.0****	**31.7**	**48.9***
	CAARs	**6.3*****	**12.7*****	**12.9*****	**40.1*****	**17.8*****	**38.6*****	**52.0*****	**70.1*****
EU spin-offs	ABHARs	-4.2	12.6*	12.2	21.0*	2.0	28.6**	53.8**	56.0
	ACARs	-4.5	7.1	11.0	18.9	-1.8	22.8*	25.1	38.6**
	CAARs	-2.5***	12.8***	15.7***	26.9***	1.8***	13.2***	21.6***	40.9***
US spin-offs	ABHARs	12.6	19.6	18.0	24.9	24.9*	31.9***	56.8	84.9
	ACARs	13.2	24.1	28.2	49.4	21.0*	21.7	35.3	55.0
	CAARs	9.5***	11.0***	9.9***	44.3***	24.2***	49.3***	65.2***	81.1***
Carve-outs	**ABHARs**	**-8.8*****	**-11.8**	**-34.3*****	**-40.4*****	**8.2*****	**-7.9***	**-17.2****	**-14.7**
	ACARs	**-6.4***	**3.1**	**-15.3*****	**-15.0*****	**4.4**	**-7.2**	**-13.0****	**-12.4***
	CAARs	**-5.7*****	**-11.5*****	**-17.2*****	**-14.8*****	**3.3*****	**-6.7*****	**-9.9*****	**3.9*****
EU carve-outs	ABHARs	-2.6	-10.1**	-17.6***	-6.6	25.6***	-14.2**	-22.1**	0.5***
	ACARs	-3.6	-8.9*	-15.3***	-6.8	12.8	-21.2***	-34.2***	-21.0*
	CAARs	-3.2***	-7.2***	-11.9***	6.2***	4.3***	-9.7***	-18.8***	20.2***
US carve-outs	ABHARs	-11.5***	-12.6	-43.3***	-61.0***	4.6	-6.4	-15.9*	-19.6
	ACARs	-8.9**	16.2	-15.3**	-27.3***	2.7	-3.8	-7.0	-9.6
	CAARs	-6.5***	-13.2***	-19.5***	-24.9***	3.4***	-5.3***	-6.0***	-3.7***

Average cumulative abnormal returns (ACARs), cumulative average abnormal returns (CAARs) and average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the conventional t-test for ACARs and CAARs and the skewness adjusted t-test for ABHARs.

5.5.3.2 Expected Returns

As shown in Table 42, the long-term stock market effects are very similar using alternative indexes for the calculation of expected returns. Using MSCI US and MSCI Europe to calculate expected returns, the effect is almost the same as by using the SP&500 and the DJ STOXX. Using two small cap indices (the Russell 2000 for the USA and the DJ STOXX SMALL for Europe), the abnormal returns of spin-offs and carve-outs are bigger than the abnormal returns based on the SP500 and DJ STOXX.

Table 42 shows one clear finding: Spin-offs parents as well as subsidiaries significantly outperform the indexes subsequent to the transaction, while carve-out parents and sub-

sidiaries underperform the indexes. Spin-off parents, as well as subsidiaries, have positive abnormal returns in all periods for all three benchmarks. Carve-out firms exhibit negative abnormal returns adjusted by the MSCI US and MSCI Europe and adjusted by the SP500 and the DJ STOXX, apart from the positive abnormal return of subsidiaries in the first year. Using the two small cap indices, carve-out parents from T to T+2 and carve-out subsidiaries in all four periods have positive abnormal returns.

Table 42: Long-term Stock Market: Alternative Expected Returns

Transac-tion type	Benchmark	Parent				Subsidiary			
		T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	SP500/DJ STOXX	**7.7**	**17.3**	**15.9**	**23.5**	**18.9*****	**30.9*****	**55.8****	**74.2**
	MSCI US/MSCI Europe	**7.2**	**16.5**	**14.5**	**21.3**	**18.4*****	**29.9*****	**53.9*****	**71.4***
	Russell 2000 / DJ STOXX Small	**12.2*****	**28.7*****	**35.7*****	**54.2*****	**23.2*****	**43.9*****	**77.8*****	**110.8*****
EU spin-offs	SP500/DJ STOXX	-4.2	12.6*	12.2	21.0*	2.0	28.6*	53.8*	56.0***
	MSCI US/MSCI Europe	-4.6	12.1*	11.6	20.0*	1.6	27.9*	52.9**	54.8
	Russell 2000 / DJ STOXX Small	2.7	25.6***	27.9***	46.6***	7.8	38.0***	63.0***	73.9***
US spin-offs	SP500/DJ STOXX	12.6	19.6	18.0	24.9	24.9*	31.9***	56.8	84.9
	MSCI US/MSCI Europe	12.0	18.6	16.1	22.0	24.4***	30.7**	54.5	81.1
	Russell 2000 / DJ STOXX Small	16.1*	30.2*	40.1*	58.4	28.7***	46.5***	85.8**	132.4**
Carve-outs	SP500/DJ STOXX	-8.8***	-11.8	-34.3***	-40.4***	8.2***	-7.9*	-17.2**	-14.7
	MSCI US/MSCI Europe	-9.4	-12.6	-35.8	-42.8	7.7**	-8.4*	-18.9**	-17.2
	Russell 2000 / DJ STOXX Small	-4.9**	0.1	-8.6**	-7.3	11.2***	2.7	5.3	19.0
EU carve-outs	SP500/DJ STOXX	-2.6	-10.1**	-17.6***	-6.6	25.6***	-14.2**	-22.1**	0.5***
	MSCI US/MSCI Europe	-3.0	-10.8	-18.0	-7.4	24.8**	-15.6**	-22.9***	-0.4
	Russell 2000 / DJ STOXX Small	3.8	0.7	1.9	11.3	32.7***	-2.1	-4.1	16.6
US carve-outs	SP500/DJ STOXX	-11.5***	-12.6	-43.3***	-61.0***	4.6	-6.4	-15.9*	-19.6
	MSCI US/MSCI Europe	-12.2	-13.5	-45.5	-64.4	4.2	-6.7	-17.8*	-22.7
	Russell 2000 / DJ STOXX Small	-8.6***	-0.3	-14.3**	-18.5**	6.8*	3.8	7.9	19.7

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX), the MSCI US (MSCI Europe) and the Russell 2000 (DJ STOXX SMALL); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs.

To compare the raw returns of spin-offs and carve-outs subsequent to the transaction provides the basis for another robustness test (Table 54). Spin parents as well as subsidiaries exhibit higher raw returns in the years subsequent to the transaction. In the year following the event spin-off parents (subsidiaries) have raw returns of 18.8% (30.5%) as compared to 2.1% (20.3) of carve-out firms. In the second year this trend continues as spin-off parents (subsidiaries) have substantially higher two-year raw returns with 43.9% (59.4%) than carve-out parents (subsidiaries) with 15.3% (22.8%).

As a further robustness test the long-term stock market effects are analyzed using the Fama French (1993) three-factor model. The three-factor model is applied by regressing the 24 post-event monthly excess returns for each firm on a market factor, a size factor and a book-to-market factor. Most interesting is the intercept α_i. The fact that the average intercept of all spin-offs, of spin-offs in Europe as well as of spin-offs in the USA is positive, indicates an excess return after controlling for market, size and book-to-market. Carve-out firms in contrast on average exhibit negative intercepts. The abnormal return (as measured by the average intercept) of spin-off subsidiaries and carve-outs parents are mostly significant on the 99% level using the conventional t-statistic based on the time-series standard deviation of the mean monthly abnormal returns. The results in Table 43 also support the findings of the approach used in the remaining paper in terms of the extent of the effect: The two-year abnormal returns of carve-out parents with –12.0% (corresponds to a monthly excess return of –0.53%) and of carve-out subsidiaries with –1.9% (-0.08%) in the Fama-French three factor model is in line with the ABHARs of –11.8% and –7.9%. The same is true for spin-offs: In the Fama-French three factor model spin-off parents exhibit abnormal two-year returns of 13.9% (0.54%) and subsidiaries of 45.7% (1.58%), while the ABHARs are 17.3% and 30.9%, respectively.

Apart from European transactions, β_s of spin-off and carve-out firms are approximately between 0.85 and 1.10. The βs of European transaction are substantially lower. The value and size factors for parents and the value factor for subsidiaries are mostly not significant. Subsidiaries exhibit a significantly positive average size factor between 26.1% and 81.5%, reflecting that they have stock market characteristics of small firms.

Table 43: Long-term Stock Market: Fama-French Three Factor Model: Average

| Transaction type and place | Parent | | | | Subsidiary | | | |
	Intercept α	B	s	h	Intercept α	β	s	h
Spin-offs	**0.54**	0.88	-12.0	-4.9	**1.58*****	0.86	63.3***	22.5
EU spin-offs	**0.34**	0.47***	-19.2	3.8	**0.48**	0.54***	26.1**	-9.4
US spin-offs	**0.64**	1.06	-8.6	-9.0	**2.12*****	1.01	81.5***	38.1
Carve-outs	**-0.53*****	0.90*	23.7***	4.3	**-0.08**	0.95	49.5***	1.5
EU carve-outs	**-0.21**	0.59***	-15.4	-17.4**	**-0.09**	0.83*	-18.2	-35.9***
US carve-outs	**-0.69*****	1.06	43.1***	15.0	**-0.08**	0.99	74.3***	15.1

Average regression coefficients of multiple OLS regressions $R_{it}-R_{ft} = \alpha_i + \beta_i (R_{mt}-R_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it}$ of 24 post-event monthly excess returns, based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the conventional t-test ($H_0 = 0$ for α_i, s_i, and h_i and $H_0=1$ for β_i).

Analyzing the median parameters estimated confirms the findings that spin-offs exhibit abnormal positive returns and carve-outs abnormal negative returns in the two years subsequent to the transaction. Hence there are substantially different results for the median abnormal returns by using the Fama-French three-factor model as compared to the results of index adjusted abnormal returns.

Table 44: Long-term Stock Market: Fama-French Three Factor Model: Median

Transaction type and place	Parent Intercept α	β	s	h	Subsidiary Intercept α	β	s	h
Spin-offs	**0.29***	0.66***	8.6***	15.8**	**0.51***	0.75***	45.6***	18.3***
EU spin-offs	**0.40**	0.37***	3.0	9.9	**0.44***	0.45***	23.0**	4.2
US spin-offs	**0.14**	0.78***	15.0***	22.1	**0.57***	1.00	52.5***	39.7***
Carve-outs	**-0.45***	0.85***	14.4***	6.3	**-0.18**	0.93	53.6***	11.2
EU carve-outs	**-0.17**	0.50***	-2.1	-10.3**	**-0.09**	0.78**	2.8	-24.3***
US carve-outs	**-0.56***	1.07	25.3***	22.8**	**-0.21**	0.96	66.7***	26.0***

Median regression coefficients of multiple OLS regressions $R_{it}-R_{ft} = \alpha_i + \beta_i (R_{mt}-R_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it}$ of 24 post-event monthly excess returns, based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test ($H_0 = 0$ for α_i, s_i, and h_i and $H_0=1$ for β_i).

The empirical evidence on differences in the intercept α as presented in Table 45 yields three key findings: (1) Spin-off parents as well as subsidiaries have significantly higher average and median abnormal returns than carve-out firms. (2) The differences between US and European transactions are not significant and (3) subsidiaries experience higher abnormal two-year returns than their parents, though these differences are not statistically significant.

Table 45: Long-term Stock Market: Fama-French Three Factor Model: Differences

	Transaction type and place	Parent		Subsidiary	
		Average	Median	Average	Median
Spin-offs vs. carve-outs	**H1a Difference spin-offs and carve-outs**	**1.08****	**0.67*****	**1.66*****	**0.69*****
	H1b Difference EU spin-offs and EU carve-outs	0.54	0.57	0.57	0.53
	H1c Difference US spin-offs and US carve-outs	1.33**	0.70***	2.19***	0.78***
European vs. US transactions	**H2a Difference EU transactions and US transactions**	**0.05**	**0.26**	**-0.55**	**0.08**
	H2b Difference EU spin-offs and US spin-offs	-0.30	0.26	-1.64	-0.13
	H2c Difference EU carve-outs and US carve-outs	0.49	0.39	-0.02	0.12

		Parent vs. Subsidiary			
		Average	Median		
Parents vs. Subsidiary	**Spin-offs**	**-1.04**	**-0.22**		
	EU spin-offs	-0.14	-0.04		
	US spin-offs	-1.48	-0.43		
	Carve-outs	**-0.45**	**-0.27**		
	EU carve-outs	-0.11	-0.08		
	US carve-outs	-0.62	-0.35		

Differences in intercept α_i of multiple OLS regressions $R_{it}-R_{ft} = \alpha_i + \beta_i (R_{mt}-R_{ft}) + s_i\, SMB_t + h_i\, HML_t + \varepsilon_{it}$ of 24 post-event monthly excess returns, based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample t-test for difference in averages and using the Mann-Whitney test for differences in median.

5.5.3.3   Outliers

Spin-offs also perform substantially better than carve-outs when abstaining from the 1.0%, 2.5% and 5.0% positive and negative outliers (Table 46). Carve-out parents and subsidiaries' underperformance increases by abstaining from the 1.0% positive and negative outliers (-10.7%, -22.4% and –35.4%; 3.2%, -13.6% and 26.3% respectively for the overlapping one, two and three years periods). The ABHARs abstained from 1.0% positive and negative outliers of spin-off parents are in line with the market overall (–2.4%, -2.8% and –7.4%) while the spun-off subsidiaries still outperform significantly (9.1%, 14.9%, 15.1%). The spun-off subsidiaries also mostly outperform when adjusting for the 2.5% and 5.0% positive and negative outliers. The results in the fourth year clearly show a survivorship bias i.e., for European transactions.

Table 46: Long-term Stock Market: Average BHARs of Spin-offs and Carve-outs without Outliers

		Parent				Subsidiary			
		T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Without 2% outliers (1% positive and 1% negative)	**Spin-offs**	**-2.4**	**-2.8**	**-7.4**	**-12.5***	**9.1***	**14.9***	**15.1***	**18.5**
	EU spin-offs	-4.8*	8.1*	3.9	17.1*	-0.0	23.9***	39.8***	42.6***
	US spin-offs	-1.0	-8.3*	-13.7*	-29.2***	14.4***	14.3**	15.7	22.5
	Carve-outs	**-10.7***	**-22.4***	**-35.4***	**-43.0***	**3.2**	**-13.6***	**-26.3***	**-29.9***
	EU carve-outs	-4.8	-12.1**	-18.4***	17.1*	20.8**	-15.8**	-26.4***	-10.6
	US carve-outs	-13.2***	-27.8***	-44.9***	-63.5***	-0.4	-13.5***	-25.9***	-38.8***
Without 5% outliers (2.5% positive and 2.5% negative)	**Spin-offs**	**-4.3**	**-6.9**	**-12.1***	**-15.8***	**5.3***	**9.2**	**-0.3**	**6.7**
	EU spin-offs	-5.8**	3.5	1.6	13.7*	-1.9	18.9**	29.9***	38.8***
	US spin-offs	-3.4	-11.2**	-21.4***	-32.8***	8.6***	6.1	-16.3*	-15.5
	Carve-outs	**-11.6***	**-23.3***	**-36.4***	**-45.4***	**0.1**	**-17.6***	**-32.5***	**-39.5***
	EU carve-outs	-7.1**	-14.1***	-19.9***	13.7*	17.1**	-17.6***	-28.7***	-22.5*
	US carve-outs	-13.5***	-28.5***	-46.4***	-65.9***	-2.3	-18.3***	-33.1***	-45.4***
Without 10% outliers (5% positive and 5% negative)	**Spin-offs**	**-5.8***	**-10.0***	**-14.7***	**-22.0***	**1.9**	**3.7**	**-8.4***	**-1.2**
	EU spin-offs	-6.4**	0.8	0.3	6.6	-5.3	11.4*	17.8**	34.9***
	US spin-offs	-5.6**	-15.4***	-23.7***	-39.1***	4.8*	0.2	-23.6***	-24.8***
	Carve-outs	**-12.4***	**-24.0***	**-37.5***	**-47.4***	**-2.5**	**-21.1***	**-38.3***	**-50.0***
	EU carve-outs	-9.1***	-15.5***	-20.6***	6.6	10.6*	-20.9***	-31.8***	-29.7***
	US carve-outs	-13.9***	-29.0***	-48.1***	-69.2***	-4.0**	-21.6***	-39.6***	-56.6***

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and "trx" transactions; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs.

5.5.3.4   Year by Year

As Fama (1998), and Mitchell and Stafford (2000) argue, overlapping return calculations of BHARs may induce cross-correlations between stock returns, and therefore affect the statistical inference. Additionally, BHARs, ACARs and CAARs represent portfolio strategies in event time, which are conceptually harder to understand than portfolio strategies in calendar time. Moreover, Fama (1998) argues that calendar-time tests of long-term returns provide the most reliable tests of market efficiency, conditional on the use of an appropriate model to calculate the excess returns. The advantage of this approach is that it controls for cross-sectional dependence among sample firms and is generally less sensitive to a poorly specified asset-pricing model. The disadvantage of this approach is that it yields an abnormal return measure that does not precisely measure investor experience. To calculate annual excess returns in calendar time, one has to cal-

culate excess returns on a portfolio strategy that invests equally in all firms that were involved in transactions completed during a year.

Table 47: Long-term Stock Market: Year by Year

Transaction type and place			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Spin-offs	All	Par	61.2	-11.1	390.4	10.7	-13.3	26.5	-18.4	-0.5	1.5	12.7	14.1	15.5
			(12)	(12)	(12)	(21)	(24)	(32)	(48)	(39)	(70)	(47)	(36)	(23)
		Sub	86.8	2.5	163.4	-24.3**	-8.7	-5.9	-1.3	49.3	38.5	65.7**	-11.0	49.7
			(6)	(8)	(12)	(12)	(18)	(28)	(36)	(33)	(53)	(32)	(19)	(20)
	EU	Par	n/a	-21.4	-34.4	11.0	5.2	-46.4**	28.6	56.0	11.0	4.1	5.7	15.3
				(4)	(1)	(2)	(2)	(2)	(13)	(14)	(21)	(22)	(21)	(17)
		Sub	n/a	-0.9	554.5	n/a	0.8	n/a	55.0	47.8	-6.6	14.1	-21.8	59.6
				(2)	(1)		(1)		(8)	(7)	(15)	(19)	(13)	(16)
	US	Par	61.2	-5.9	429.0	10.7	-15.0	31.3	-35.9***	-32.1	-2.5**	20.2	26.0	15.9
			(12)	(8)	(11)	(19)	(22)	(30)	(35)	(25)	(49)	(25)	(15)	(6)
		Sub	86.8	3.6	127.9	-24.3**	-9.2	-5.9	-17.4	49.7	56.3	141.1***	12.5	9.8
			(6)	(6)	(11)	(12)	(17)	(28)	(28)	(26)	(38)	(13)	(6)	(4)
Carve-outs	All	Par	-47.5***	-38.4***	17.2	-17.5***	-35.9***	-24.3***	-39.2***	-51.9***	103.7	3.4	-11.6	-17.7
			(6)	(14)	(21)	(33)	(24)	(35)	(49)	(31)	(28)	(48)	(27)	(12)
		Sub	-46.4***	25.4	2.2	-0.9	11.2	-5.3	1.9	-56.6***	-22.5	-23.8**	-5.0	10.0
			(10)	(22)	(42)	(72)	(49)	(40)	(57)	(38)	(30)	(50)	(23)	(5)
	EU	Par	n/a	n/a	n/a	-65.2	-18.0	-0.1	-13.3	-32.7***	14.4	-5.3	-15.3	-20.6
						(1)	(1)	(11)	(12)	(7)	(12)	(35)	(23)	(5)
		Sub	n/a	n/a	n/a	n/a	-73.0	33.8	-7.7	-19.1	-47.4***	-10.1	-17.7**	-17.9
							(1)	(8)	(9)	(6)	(9)	(28)	(21)	(1)
	US	Par	-47.5***	-38.4***	17.2	-16.0***	-36.6***	-35.3***	-47.6***	-57.5***	170.7	27.0	9.4	-15.6
			(6)	(14)	(21)	(32)	(23)	(24)	(37)	(24)	(16)	(13)	(4)	(7)
		Sub	-46.4***	25.4	2.2	-0.9	12.9	-15.1	3.8	-63.6***	-11.9	-41.2***	128.3	16.9
			(10)	(22)	(42)	(72)	(48)	(32)	(48)	(32)	(21)	(22)	(2)	(4)

Average buy and hold abnormal returns (ABHARs) from T to T+2 in % and in brackets number of transactions; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the t-test for ABHARs.

Based on this argumentation the stability of the long-term stock market effect of spin-offs and carve-outs over time is further assessed by investigating the effects separately for each year in the sample period. Table 47 shows the two-year post transaction AB-HARs for alternative transaction types based on their completion date. In this perspective as well, spin-off firms perform much better than carve-out firms. While spin-off parents (subsidiaries) outperform in 8 (7) years, carve-outs parents (subsidiaries) outper-

form only in 3 (5) out of 12 years covered. The average two-year ABHAR of spin-off parents (subsidiaries) is, with 40.8% (33.7%), substantially higher than the one of carve-outs parents (subsidiaries), with –13.3% (-9.2%). There is in none of the twelve years covered a significant positive ABHAR for carve-outs parents or subsidiaries.

For both types of transactions, the years from 1990 until 1992 and from 1998 until 2003, proved to be rather positive years and the mainly negative years were from 1993 until 1997. Comparing the ABHARs of US and European transactions shows that for spin-offs, it is unclear where there are more positive years. Spin-off subsidiaries on both continents exhibit in 66.6% of the year a positive outperformance, while for parents, the share of positive years is slightly higher in Europe than in the US (72.7% vs. 58.3%). In carve-outs, in contrast, there is a substantial difference between the USA and Europe. European parent (subsidiary) firms experience only in 1 out of 9 (8) years with data available, a positive two-year post transaction ABHAR, while US parent (subsidiary) firms have positive ABHARs in 4 (6) out of 12 years.

5.5.4   Industrial Focus

The impact of industrial focus on the long-term stock market performance of spin-off and carve-out firms is doubtful, as the differences in the long-term average BHARs of parents as well as of subsidiaries are not statistically significant, neither for carve-out nor for spin-off firms. The only significant difference between industrial focus increasing transactions and non-industrial focus increasing transactions is from T to T+4 (significant on the 90% level for parent firms of US carve-outs). Results in Table 48 indicate that parent firms spinning-off non-related subsidiaries perform better than parents' spinning-off related businesses. This finding is derived from US transactions. In carve-outs, parents seem to exhibit a better performance in Europe if they carve-out a non-related business. In the US, in contrast, parent firms have higher abnormal returns if they carve-out a related subsidiary. Industrial focus does not have an obvious influence on the long-term abnormal performance of subsidiaries, neither in spin-offs nor in carve-outs. These results provide evidence that the higher value creation of industrial focus increasing transactions is covered by the difference in the announcement effect. Hence "H5", that firms involved in spin-offs and carve-outs that improve the industrial focus increase the firm value in the long run more than firms involved in non-industrial focus increasing transactions, is rejected.

Table 48: Long-term Stock Market: Industrial Focus

Transaction type and place		Parent				Subsidiary			
		T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	**Difference**	**14.0**	**15.3**	**28.7**	**36.0**	**15.2**	**-0.5**	**-27.9**	**17.2**
	Ind. Focus	14.2	24.4	28.5	38.9	26.2**	30.4**	44.1*	83.0
	Not Ind. Focus	0.2	9.1	-0.2	2.9	11.0	31.0*	72.0	65.7**
EU spin-offs	**Difference**	**1.4**	**-0.4**	**16.2**	**-14.0**	**2.2**	**-14.7**	**18.8**	**-65.8**
	Ind. Focus	-3.6	12.4*	18.7	15.5	2.9	22.4*	61.7**	28.5**
	Not Ind. Focus	-5.0	12.8	2.4	29.5*	0.7	37.1**	43.0*	94.3**
US spin-offs	**Difference**	**19.9**	**23.5**	**36.0**	**64.0**	**20.2**	**6.0**	**-53.1**	**67.7**
	Ind. Focus	22.2	31.0	34.4	52.4	34.9**	34.3**	33.6	116.4
	Not Ind. Focus	2.3	7.5	-1.6	-11.7***	14.7	28.3	86.7	48.7
Carve-outs	**Difference**	**2.0**	**-32.2**	**-5.9**	**-13.4**	**12.3**	**8.5**	**-12.7**	**7.5**
	Ind. Focus	-8.8***	-20.5***	-35.4***	-44.8***	9.1**	-4.4	-21.8***	-20.5*
	Not Ind. Focus	-10.7**	11.7	-29.5***	-31.5***	-3.2	-12.9	-9.2	-28.0*
EU carve-outs	**Difference**	**5.1**	**14.4**	**10.5**	**15.9**	**3.4**	**-10.4**	**-27.2**	**-10.6**
	Ind. Focus	-4.5	-5.4	-11.3*	4.1	28.5**	-14.3**	-22.4**	10.6
	Not Ind. Focus	-9.6*	-19.9**	-21.7***	-11.9	25.0	-3.9	4.9	21.2
US carve-outs	**Difference**	**0.2**	**-50.0**	**-17.5**	**-35.8***	**11.6**	**12.4**	**-9.8**	**8.7**
	Ind. Focus	-10.8***	-28.9***	-49.3***	-74.4***	4.7	-2.0	-21.7***	-30.7***
	Not Ind. Focus	-11.0**	21.1	-31.8***	-38.6***	-6.9	-14.4	-11.8	-39.4**

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

5.5.5   Geographical Focus

As outlined in the descriptive statistics, an increase in geographical focus does not seem to be major rationale for spin-offs and carve-outs. This can be seen in that out of the 948 transactions investigated for the long-term stock market effects (with data available on the geographical focus), only 95 are cross-border. Additionally, there are no clear differences in long-term stock market abnormal returns between cross-boarder transactions and domestic transactions. Only for US carve-outs (parents from T to T+2 and subsidiaries from T to T+3) is there a statistically significant difference between geographical focus increasing and geographical focus non-increasing transactions in the two periods. The other differences are not significant, although they are partially substantial. Spin-offs seem to be more successful on the stock market if the parent firms spins-off a subsidiary in the same country. However, as there are only fourteen geographical focus-

increasing transactions in the sample investigated, the interpretation of these results has to be made very cautiously. Based on the evidence in this restricted sample, the Geographical Focus Hypothesis "H6", that spin-offs and carve-outs that improve the geographical focus increase the firm value more than transactions not improving the geographical focus, is rejected.

Table 49: Long-term Stock Market: Geographical Focus

Transaction type and place		Parent				Subsidiary			
		T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Spin-offs	**Difference**	**-37.7**	**-42.0**	**-26.0**	**-17.2**	**-4.6**	**-61.5**	**-114.3**	**-140.7**
	Geo. Focus	-28.9***	-23.1***	-9.1*	7.1	14.5	-28.2	-53.6***	-58.7***
	Not Geo. Focus	8.8	18.9	16.8	24.2	19.1***	33.3***	60.7**	82.0**
EU spin-offs	**Difference**	**-22.8**	**-35.6**	**-24.8**	**15.8**	**-25.8**	**-27.0**	**-74.7**	**-60.9**
	Geo. Focus	-26.2***	-20.4***	-10.9***	35.4**	-22.1***	3.4	-16.2***	0.1***
	Not Geo. Focus	-3.3	15.2*	13.9	19.6*	3.7	30.5**	58.4**	61.0***
US spin-offs	**Difference**	**-48.5**	**-49.9**	**-23.8**	**-95.1**	**21.5**	**-100.6**	**-152.9**	**-226.0**
	Geo. Focus	-35.0***	-29.3***	-5.4	-68.4***	45.8	-66.1*	-91.0***	-132.3***
	Not Geo. Focus	13.5	20.6	18.4	26.6	24.3***	34.5**	61.9	93.7
Carve-outs	**Difference**	**4.6**	**66.7**	**6.9**	**17.9**	**19.0**	**-13.0**	**-46.8**	**-11.2**
	Geo. Focus	-4.7	43.6	-28.8***	-26.0*	24.5**	-18.9*	-57.5***	-24.4
	Not Geo. Focus	-9.3***	-23.0***	-35.6***	-43.9***	5.5*	-5.9	-10.7	-13.2
EU carve-outs	**Difference**	**0.1**	**10.9**	**8.1**	**32.1**	**12.3**	**-2.2**	**-19.8**	**-2.0**
	Geo. Focus	-1.6	-1.9	-11.8	16.8	34.5*	-15.8*	-36.5**	-1.0
	Not Geo. Focus	-1.7	-12.7**	-19.9***	-15.3**	22.2*	-13.7*	-16.6*	1.0
US carve-outs	**Difference**	**4.5**	**119.8*****	**-11.3**	**-36.6**	**16.6**	**-16.3**	**-64.2*****	**-32.1**
	Geo. Focus	-7.5	92.5	-53.4***	-93.8***	19.3	-20.7	-73.7***	-49.0
	Not Geo. Focus	-12.0***	-27.3***	-42.1***	-57.3***	2.7	-4.4	-9.4	-16.9

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

5.5.6 Incentive Alignment

Making the distinction between parents and subsidiaries shows that parents in both spin-offs and carve-outs perform worse than their subsidiaries. The differences in ABAHRs for spin-offs are substantial, though only significant for European spin-offs in the three-year period with a difference of 41.6%. In carve-outs, the difference between the two firms involved is only significant in the first year, when subsidiaries perform much better

(8.2%) than their former parents (–8.8%). As outlined above, this effect may be influenced by the support for the subsidiary stock of the players involved in the IPO. In the longer intervals, the difference is no longer significant, apart from US transactions in the three- and four-year period. Analyzing median BHARs (MBHARs) supports this finding of non-significant differences in long-term abnormal returns between parents and subsidiaries. Neither the median spin-off nor carve-out parent out- or underperforms significantly different than their median subsidiaries. In carve-outs starting from the second year (subsequent to the transaction), the parent firms perform even better than their subsidiaries. The evidence on the Incentive Alignment Hypothesis "H7" is mixed: Subsidiaries in both spin-offs and carve-outs perform better than their parent firms. The differences, on average, are substantial; however they are mostly insignificant.

Table 50: Long-term Stock Market: Parents vs. Subsidiaries

	Difference in ABHARs: Parents and subsidiaries				**Difference in MBHARs**: Parents and subsidiaries			
	T to T+1	**T to T+2**	**T to T+3**	**T to T+4**	**T to T+1**	**T to T+2**	**T to T+3**	**T to T+4**
Spin-offs	**-11.2**	**-13.6**	**-39.9**	**-50.6**	**-2.3**	**-0.9**	**-0.6**	**-1.6**
EU spin-offs	-6.1	-16.0	-41.6*	-35.0	10.8	1.5	3.1	-21.8
US spin-offs	-12.4	-12.4	-38.9	-60.0	-6.8**	-10.2	-1.5	11.2
Carve-outs	**-17.0*****	**-3.9**	**-17.0**	**-25.8**	**-3.5**	**10.0**	**10.7**	**9.6**
EU carve-outs	-28.2**	4.2	4.5	-7.1	0.1	15.8	7.8*	22.7*
US carve-outs	-16.1***	-6.3	-27.4*	-41.4*	-4.2*	8.6	3.9	4.4

Average buy and hold abnormal returns (ABHARs) and median buy and hold abnormal returns (MBHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample t-test for the difference in ABHARs and the two sample Mann-Whitney test for the difference in MBHARs.

5.5.7 Independence of Subsidiary

Table 51 shows ABHARs of carve-outs outlining the trajectory of subsidiaries two years subsequent to the transaction. The long-term stock market effect for carve-outs with alternative trajectories differs significantly: Subsidiaries acquired, merged, bought back by their parents, delisted or that have a free float smaller than 75%, show a significant long-term underperformance. Subsidiary with a free float larger than 75%, in contrast, outperform their benchmarks by 11.3% in the first year and 37.8% in the two years subsequent to the event. This might come from the fact that they are more independent than the other subsidiaries. The differences between the abnormal returns of independent

carve-out subsidiaries and the other carve-out subsidiaries are 13.0% in the first year and 62.9% (significant on the 99% level) in the two years subsequent to the transaction.

Table 51: Long-term Stock Market: Trajectory of Carve-out Subsidiary

Transaction type based on status 2 years after the carve-out	Parent				Subsidiary	
	T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2
Difference free float >75% and other carve-outs	5.7	-28.3	8.1	-0.8	13.0	62.9***
Acquired or merged	-5.8	49.3	-26.2***	-58.9***	-11.9**	-18.1
Buy back	3.8	-9.2	-37.1***	-26.3	-7.3	-41.0***
Delisted	-30.0***	-44.5***	-85.0***	-96.1***	-22.4***	-46.7***
Free float > 75%	-1.8	-19.2***	-19.4**	-40.5**	11.3**	37.8***
Free float 50 - 75%	-22.7***	-9.2	-13.2	-0.4	-2.7	-48.6***
Free float 0 - 50%	-18.4***	-36.5***	-54.0***	-86.4***	4.1	-21.8**
Free float n/a	0.0	-8.0	-7.6	-2.5	38.3**	-14.6

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 639 carve-outs occurring between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

Comparing the long-term abnormal returns following the completion between transactions where the subsidiaries are independent two years following the transaction (spin-offs and carve-outs with a free float bigger than 75%) and transactions with still dependent subsidiaries (other carve-outs) supports the Independence of Subsidiary Hypothesis "H8".

Table 52: Long-term Stock Market: Independence of Subsidiary

Transaction type	Parent				Subsidiary	
	T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2
Difference	14.1	4.3	40.0	56.6	19.1*	57.3***
Independent subsidiaries (spin-offs and carve-outs with a free float > 75%)	6.6	13.5*	12.4	16.8	17.4***	32.3***
Dependent subsidiaries (other carve-outs)	-7.5*	9.2	-27.5***	-39.8***	-1.7	-25.1***

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

Spin-offs have significantly larger abnormal returns than carve-outs, and within carve-outs, those transactions leading to independence also have higher abnormal returns.

Hence, the significant differences between independent and dependent subsidiaries' long-term abnormal returns of 19.1% and 57.3% are not surprising.

5.5.8 Relative Size of Transaction

To assess the impact of the relative size of the transaction on the long-term stock market effect, transactions with a smaller (larger) relative value than the median are classified as "small" ("large"). In contrast to the announcement effect results, the relative size is no major driver for the long-term stock market effect (Table 53).

Table 53: Long-term Stock Market: Relative Size of Transaction

Transaction type and place		# of trx for long-term stock market effects	Parent				Subsidiary			
			T to T+1	T to T+2	T to T+3	T to T+4	T to T+1	T to T+2	T to T+3	T to T+4
Carve-outs	Difference		**8.7**	**-14.6**	**16.2**	**5.9**	**6.1**	**26.6**	**16.6**	**0.3**
	Small	152	-4.8**	-16.3***	-25.9***	-36.2***	12.2**	12.3*	-2.8*	6.7
	Large	151	-13.5***	-1.7	-42.1***	-42.1***	6.1**	-14.3	-19.5	6.4
EU carve-outs	Difference		**-12.4**	**-8.2**	**14.9**	**31.8**	**-2.8**	**7.5**	**23.5**	**10.0**
	Small	39	-7.3*	-12.9**	-7.3	13.3	11.5	-2.1	1.7	35.6
	Large	38	5.2	-4.8	-22.2***	-18.5*	14.3	-9.5	-21.7	25.6
US carve-outs	Difference		**16.0***	**-17.2**	**15.5**	**-9.6**	**8.4**	**32.3**	**14.0**	**-5.6**
	Small	113	-3.9	-17.7***	-34.4***	-61.7***	12.4	16.4**	-4.5*	-7.7
	Large	113	-19.9***	-0.5	-49.9***	-52.1***	4.0	-15.9	-18.6	-2.2
Spin-offs	Difference		**3.1**	**3.6**	**-4.7**	**-21.6**	**4.9**	**-16.2**	**-105.3**	**-36.2**
	Small	154	4.2	13.7	5.1	-15.6	19.8***	27.2**	9.7	20.7
	Large	153	1.2	10.1	9.8	5.9	14.9*	43.4**	115.0**	56.9*
EU spin-offs	Difference		**19.1*****	**-5.7**	**-35.2**	**-59.8***	**30.6***	**9.5**	**-19.0**	**62.7**
	Small	39	3.7	12.2**	-2.2	-5.7	23.6*	39.2***	59.9***	89.2***
	Large	39	-15.4***	17.9	33.0*	54.1***	-7.0	29.7*	78.9**	26.5
US spin-offs	Difference		**-3.2**	**8.3**	**13.9**	**8.7**	**-3.6**	**-28.3**	**-157.5**	**-101.8**
	Small	115	4.5	14.4	9.0	-21.0	18.3**	20.9	-20.0	-25.0
	Large	114	7.7*	6.1	-4.9	-29.7*	21.9**	49.2**	137.4*	76.8

Average buy and hold abnormal returns (ABHARs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; sample partially smaller as no data on relative size of transaction available; US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the skewness adjusted t-test for ABHARs and the two sample t-test for the difference in ABHARs.

The only significant differences are for parents and subsidiaries of European spin-offs and for parents of US carve-outs in the first year subsequent to the transaction. That

means that smaller transactions benefit not only around the announcement but partially as well in the subsequent year. The effects later vanish as the only additional significant difference is from T to T+4 for parents of European spin-offs. Overall there is evidence to reject the Relative Size of Transaction Hypothesis "H9" on the stock market in the long run.

5.5.9   Timing

Managers conducting spin-offs and carve-outs show stock market timing capabilities, as the average and the median index return before transactions is significantly higher than afterwards. On average, broad stock market indices[181] have 34.1% (34.8%) two-year returns before carve-out (spin-off) transactions and 22.8% (23.1%) afterwards. As carve-outs are not only a way for restructuring the business, but also a mean for financing, the companies' stock market valuation at the transaction date is highly relevant. Hence, it concurs with the results of Hand and Skantz (1999b), which states that managers of carve-out firms successfully exploit fluctuations in the market valuation of their firm.

The parent company's pre-carve-out one-year (22.1%) and two years (41.1%) mean return is substantially higher than its return on the market following the transaction (2.1% and 15.3%). The average return of the subsidiary company after the transaction is higher than the one of the parent company for both spin-offs and carve-outs. However, the median raw return of carve-outs subsidiaries one (1.0%) and two years (-3.3%) following the transaction is substantially lower than the median parent company's return before the transaction (13.7% and 28.4%).[182]

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[181] For US transactions, the total return index of the S&P 500 COMPOSITE is used as market proxy. For European transactions, the total return index of the DJ STOXX TOTAL MARKET INDEX is used.

[182] These results are in line with the findings of Powers (2001), which documents that carve-outs occur during bull market periods and in industries that are "hot". The mean (median) pre-event one-year return for carve-out division industries is, with 27.6% (25.8%), significantly greater (at the 1% level) than returns for either spin-offs 13.6% (12.8%) or sell-offs 15.0% (10.6%) industry.

Table 54: Long-term Stock Market: Raw Returns

Transaction type and place		Index		Parent		Subsidiary	
		2 years	1 year	2 years	1 year	2 years	1 year
Spin-offs	**Difference**	**11.7*****	**2.4*****	**-6.1**	**5.6**	**-21.5**	**-6.2**
	Before	34.8 (34.6)	13.9 (16.5)	37.9 (12.1)	24.3 (9.6)		
	After	23.1 (26.6)	11.4 (13.3)	43.9 (10.5)	18.8 (2.5)	59.4 (6.6)	30.5 (17.8)
EU spin-offs	**Difference**	**16.3*****	**2.4**	**16.0**	**31.5****	**4.5**	**26.6**
	Before	27.9 (29.2)	9.0 (11.1)	40.1 (7.6)	33.4 (8.0)		
	After	11.6 (10.4)	6.6 (9.6)	24.0 (7.5)	1.8 (-0.1)	35.6 (-6.6)	6.8 (5.5)
US spin-offs	**Difference**	**10.0*****	**2.4****	**-16.8**	**-5.6**	**-33.1***	**-18.7***
	Before	37.3 (36.9)	15.6 (17.7)	36.8 (12.9)	20.2 (10.9)		
	After	27.3 (28.9)	13.2 (15.6)	53.6 (14.2)	25.7 (4.5)	69.9 (12.7)	38.9 (24.5)
Carve-outs	**Difference**	**11.3*****	**4.3*****	**25.8****	**20.0*****	**18.3****	**1.8**
	Before	34.1 (31.1)	14.5 (13.1)	41.1 (28.4)	22.1 (13.7)		
	After	22.8 (24.1)	10.3 (11.4)	15.3 (0.2)	2.1 (-3.2)	22.8 (1.0)	20.3 (-3.3)
EU carve-outs	**Difference**	**27.3*****	**6.9*****	**68.6*****	**23.6*****	**75.7*****	**-6.0**
	Before	32.8 (33.2)	12.5 (12.5)	66.1 (38.0)	26.0 (15.1)		
	After	5.4 (-3.5)	5.6 (12.1)	-2.5 (-14.3)	2.4 (-4.9)	-9.6 (-5.4)	32.0 (-22.5)
US carve-outs	**Difference**	**6.6*****	**3.5*****	**5.5**	**18.4*****	**-0.5**	**2.4**
	Before	34.5 (29.7)	15.1 (13.3)	29.9 (25.7)	20.4 (12.7)		
	After	28.0 (27.5)	11.6 (11.3)	24.4 (4.6)	2.0 (-1.8)	30.4 (3.7)	17.9 (3.9)

Average buy and hold returns (ABHRs) and median buy and hold returns (MBHRs) in %; based on a sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003; US (European) index is the SP500 (DJ STOXX); T denotes the execution date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample t-test for the difference in ABHARs.

As there is no cash involved in spin-offs, stock market timing for managers of spin-off firms is less relevant than for managers of carve-out firms. The empirical evidence supports this assumption. The average spin-off parent firm has similar one-year pre-spin-off (24.3%) and post-spin-off returns (18.8%), with higher two years return after the transaction (43.9%) than before (37.9%). Spun-off subsidiaries in contrast show, on average, higher one and two year returns after the transaction (30.5% and 59.4%) than the parent firm had before the transaction. Brounen, de Jong, and Koedijk (2004) document, in their survey among 313 CFOs of European companies, that European CFOs put less weight on the relative valuation of their companies' equity when deciding on how to finance, as compared to their colleagues in the USA (Graham and Harvey, 2001). Brounen, de Jong, and Koedijk (2004) interpret this result as evidence for the lower role of security pricing in public markets in continental Europe as compared to the USA. Contrary to this, this study documents that both European spin-offs and carve-outs have

significantly lower post-transaction raw returns as compared to pre-transaction returns, supporting the Stock Market Timing Hypothesis "H10" for European transactions.

Another indication for market timing is the correlation between the overall stock market development and public ownership restructuring activities. The return on the overall stock market, measured by the S&P 500 total return index is, is with R^2 values of 22.4%, a good predictor for the change in number of spin-offs in the same year. The R^2 values for carve-outs are lower with 8.5%. Another indication of stock market timing by managers is that there are substantially more positive one-year index returns before transactions than on average. In the period investigated from January 1990 to April 2003, there are 148 overlapping one-year phases (from January 1990 to January 1991, from February 1990 to February 1991 and so on). The SP&500 has 105 (78.4%) one-year periods with positive returns and the DJ STOXX 105 (70.9%). Compared to this, there are substantially more positive index returns before spin-offs (82.5%) and in particular before carve-outs (93.1%) in the year before the transaction. The share of positive index returns declines in the year following the transaction to 78.2% for spin-offs and to 84.0% for carve-outs.

These results support the Stock Market Timing Hypothesis "H10". "H10a" is supported, as managers prefer to undertake not only carve-outs after bull markets, but also spin-offs, as managers want to have a positive stock market environment for their newly listed spin-off subsidiary.[183] In line with "H10b", market returns of carve-out companies before the transaction are substantially higher than returns after the transaction. There is no such difference between pre- and post-returns of spin-off firms. The evidence on "H10c" is mixed, as both spin-off as well as carve-out parent firms show superior 1-year and 2-years pre-transaction returns as compared to the market overall.

5.5.10   Cross Sectional Regressions

In this Section, results from univariate regressions of the BHARs are presented. The cross-sectional analysis is conducted by running OLS regressions of two-year post transaction BHARs of parents and subsidiaries on a set of explanatory variables (X):

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[183] A positive market environment is required to enable a good start of the subsidiary firm as an independently listed company (Haas, 2003).

$$BHAR_i = \alpha_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \varepsilon_i$$

Table 55 shows the explanatory variables used. The number of variables is with 46 high, but it is required to gain insights about the economic drivers for the long-term stock market effects that are economically stable and not specific to a particular variable definition. The variables REGION, ANTIDIR, SIZE, INDFOCUS, GEOFOCUS and INDEP are employed as well for the cross-sectional regressions on the announcement CARs and are described in Section 5.4.9. TRX_CAT differentiates spin-offs from carve-outs and ANNOUNCE measures the influence of the announcement CAR in the event window from t-3 to t+3 on long-term BHARs. PARENT/SUB assesses how parents BHARs are linked to the subsidiaries BHARs. Variables based on price multiples and profitability are used on absolute levels two years following the transaction (T+2) and as dummy variables (based on whether they increase the price multiple or the profitability from T-1 to T+3 for parents and from T+1 to T+3 for subsidiaries). One expects a positive influence of price multiples and profitability variables on BHARs of parents as well as of subsidiaries. That means "the higher the profitability/price multiple in T+2, the higher the abnormal return" and "if the profitability/price multiple in T+3 is bigger than in T-1 or T+1, the higher the abnormal return". In contrast regarding the leverage level and evolution, one expects a negative influence on BHARs: "The higher the financial debt-to-assets ratio before or following the transaction, the lower the abnormal returns" and "if the financial debt divided by total assets ratio in T+3 is bigger than in T-1 or T+1, the lower the abnormal returns". There are also two revenues (REV_GRO_PAR_POST and REV_GRO_SUB_POST) and two earnings growth measures (EAR_GRO_PAR_PRE and EAR_GRO_SUB_POST) used as explanatory variables. For post-transaction growth measures, one expects a positive influence and for the pre-transaction growth measure, a negative one, indicating market timing. The impact of market timing is also tested based on raw and abnormal buy and hold returns of parent firms before the transaction. One expects a negative influence of the variables on post-transaction BHARs. Firms resulting from parents that performed better before the transaction perform worse subsequent to the transaction. As some of the variables are dummy (1 or 0) and others are on different absolute levels, the interpretation of the sizes of the coefficients has to be made very carefully.

Table 55: Long-term Stock Market: Explanatory Variables

		Regressor (X)	Definition	Construction	Exp. sign
Overall factors		TRX_CAT	Spin-offs (1) vs. carve-outs (0)	Dummy	+
		REGION	European transactions (0) vs. US transactions (1)	Dummy	=
		ANTIDIR	Level of Anti-director rights in the country of the parent company; ranging from low (1) to high (5)	1 to 5	=
		SIZE	Deal value as % of parent market capitalization at T	%	−
		INDFOCUS	Parent and subsidiary belong to the same (0) or to different industries (1) based on the two-digit SIC code	Dummy	+
		GEOFOCUS	Parent and subsidiary are from the same (0) or different countries (1)	Dummy	+
		ANNOUNCE	Announcement CARs in the event window from t-3 to t+3	%	+
		PARENT/SUB	Parents/subsidiary BHARs from T to T+2	%	+
		INDEP	Transaction leading to independent subsidiaries (spin-offs and carve-outs with free float > than 75%;1) vs. dependent (other carve-outs;0)	Dummy	+
Price multiples	Level	PB_PAR_T+2	Parents' market cap/book equity (P/B) in T+2	%	+
		PB_SUB_T+2	Subsidiaries' market cap/book equity (P/B) in T+2	%	+
		PE_PAR_T+2	Parents' market cap/earnings (P/E) in T+2	%	+
		PE_SUB_T+2	Subsidiaries' market cap/earnings (P/E) in T+2	%	+
		PS_PAR_T+2	Parents' market cap/revenues (P/S) in T+2	%	+
		PS_SUB_T+2	Subsidiaries' market cap/revenues (P/S) in T+2	%	+
	Evolution	PB_PAR_EV	Parents' P/B T+3 is higher (1) or lower (0) than P/B T-1	Dummy	+
		PB_SUB_EV	Subsidiaries' P/B T+3 is higher (1) or lower (0) than P/B T+1	Dummy	+
		PE_PAR_EV	Parents' P/E T+3 is higher (1) or lower (0) than P/E T-1	Dummy	+
		PE_SUB_EV	Subsidiaries' P/E T+3 is higher (1) or lower (0) than P/E T+1	Dummy	+
		PS_PAR_EV	Parents' P/S T+3 is higher (1) or lower (0) than P/S T-1	Dummy	+
		PS_SUB_EV	Subsidiaries' P/S T+3 is higher (1) or lower (0) than P/S T+1	Dummy	+
Profitability	Level	EAR/ASS_PAR_T+2	Parents' earnings/total assets in T+2	%	+
		EAR/ASS_SUB_T+2	Subsidiaries' earnings/total assets on T+2	%	+
	Evolution	EBIT/REV_PAR_EV	Parents' EBIT/revenues T+3 is bigger (1) or smaller (0) than T-1	Dummy	+
		EBIT/REV_SUB_EV	Subsidiaries EBIT/revenues T+3 is bigger (1) or smaller (0) than T+1	Dummy	+
		EAR/ASS_PAR_EV	Parents' earnings/assets T+3 is bigger (1) or smaller (0) than T-1	Dummy	+
		EAR/ASS_SUB_EV	Subsidiaries' earnings/assets T+3 is bigger (1) or smaller (0) than T+1	Dummy	+
		EAR/REV_PAR_EV	Parents' earnings/revenues T+3 is bigger (1) or smaller (0) than T-1	Dummy	+
		EAR/REV_SUB_EV	Subsidiaries' earnings/revenues T+3 is bigger (1) or smaller (0) than T+1	Dummy	+
Leverage	Level	DEBT_PAR_T-2	Parents' financial debt/total assets in T-2	%	−
		DEBT_PAR_T-1	Parents' financial debt/total assets in T-1	%	−
		DEBT_PAR_T+1	Parents' financial debt/total assets in T+1	%	−
		DEBT_SUB_T+1	Subsidiaries' financial debt/total assets in T+1	%	−
		DEBT_SUB_T+2	Subsidiaries' financial debt/total assets in T+2	%	−
	Evolution	DEBT_PAR_EV	Parents' debt/assets T+3 is bigger (1) or smaller (0) than in T-1	Dummy	−

		Regressor (X)	Definition	Construc-tion	Exp. sign
	tion	DEBT_SUB_EV	Subsidiaries' debt/assets T+3 is bigger (1) or smaller (0) than in T+1	Dummy	–
Growth		REV_GRO_PAR_POST	Parents' CAGR Revenue growth from T+1 to T+3	%	+
		REV_GRO_SUB_POST	Subsidiaries' CAGR Revenue growth from T+1 to T+3	%	+
		EAR_GRO_PAR_PRE	Parents' CAGR earnings growth from T-5 to T	%	–
		EAR_GRO_SUB_POST	Subsidiaries' CAGR earnings growth from T+1 to T+3	%	+
Tim-ing	Raw	BHR_PAR_-3YEARS	Parents' Buy and Hold Return from -36 months to –1 month	%	–
		BHR_PAR_-2YEARS	Parents' Buy and Hold Return from -24 months to –1 month	%	–
		BHR_PAR_-1YEAR	Parents' Buy and Hold Return from -12 months to –1 month	%	–
	Ad-justed	BHAR_PAR_-3YEARS	Parents Buy and Hold Abnormal Return from -36 months to –1 month	%	–
		BHAR_PAR_-2YEARS	Parents Buy and Hold Abnormal Return from -24 months to –1 month	%	–
		BHAR_PAR_-1YEAR	Parents Buy and Hold Abnormal Return from -12 months to –1 month	%	–

T denotes the execution date and t the announcement date.

In Section 5.5.10.1, the results of the univariate regressions of parents and subsidiaries BHARs for all transactions are presented. The same is then done separately for spin-offs in Section 5.5.10.2 and for carve-outs in Section 5.5.10.3. Multivariate regressions for spin-offs are discussed in Section 5.5.10.4 and for carve-outs in 5.5.10.5.

5.5.10.1   Univariate Regressions on All Transactions

The results obtained by regressing the BHARs from T to T+2 of parents and subsidiaries on the alternative regressors for 1202 transactions (563 spin-offs and 639 carve-outs) are reported in Table 56. The estimated sensitivity coefficients for parent and subsidiary BHARs represent evidence that out of the overall factors, only PARENT/SUB and TRX_CAT are significant for both parent and subsidiary BHARs. This means that parent and subsidiaries BHARs are positively correlated. The significant positive effect of TRX_CAT documents that spin-offs create higher two-year BHARs for parents (sensitivity of 29.1%) as well as for subsidiaries (sensitivity of 38.8%) than carve-outs. RE-GION, ANTIDIR, SIZE, INDFOCUS and ANNOUNCE do not show significant influence on neither parent nor subsidiary BHARs. INDEP shows a strong impact on subsidiaries abnormal returns with a sensitivity of 57.4% (t-statistic of 4.6), but no significant impact on parent BHARs. Subsidiaries resulting from cross-boarder transaction have significantly lower BHARs than subsidiaries in the same country as the parent firm.

Table 56: Long-term Stock Market: Univariate Analysis on BHARs

		Parent				Subsidiary			
	Regressor (X)	Sensitivity	t-statistic	R^2	# of trx	Sensitivity	t-statistic	R^2	# of trx
Overall factors	TRX_CAT	29.05*	1.64	0.36%	716	38.77***	2.79	1.36%***	724
	REGION	2.83	0.20	0.00%	716	-0.30	-0.03	0.00%	724
	ANTIDIR	4.00	1.13	0.04%	714	1.17	0.29	0.00%	713
	SIZE	0.01	0.28	0.00%	547	-0.06	-2.53	0.21%	396
	INDFOCUS	-7.36	-0.37	0.02%	666	-1.39	-0.09	0.00%	672
	GEOFOCUS	30.08	0.65	0.13%	711	-30.71**	-2.49	0.32%	723
	ANNOUNCE	0.75	0.38	0.12%	594	-0.58	-1.30	0.15%	403
	PARENT/SUB	0.18	1.42	3.15%***	431	0.17	1.15	3.15%***	431
	INDEP	4.33	0.15	0.00%	551	57.34***	4.57	2.21%***	495
Price multiples — Level	PB_PAR_T+2	0.07	1.02	0.00%	482	-0.06	-0.85	0.01%	325
	PB_SUB_T+2	-0.19	0.29	0.29%	358	2.07*	1.84	0.63%*	527
	PE_PAR_T+2	0.09	0.81	0.13%	535	0.03	0.99	0.05%***	355
	PE_SUB_T+2	-0.19***	-7.29	21.01%***	376	-0.20***	-2.61	5.27%	543
	PS_PAR_T+2	16.77**	2.21	13.55%***	533	0.53	0.47	0.04%	354
	PS_SUB_T+2	0.14	1.36	0.31%	375	0.09	0.84	0.02%	539
Price multiples — Evolution	PB_PAR_EV	56.77*	1.71	0.73%	350	53.11**	2.17	1.76%**	229
	PB_SUB_EV	-11.35	-1.02	0.31%	285	2.21	0.12	0.00%	433
	PE_PAR_EV	68.59**	2.11	1.15%**	377	60.42**	2.56	2.49%**	250
	PE_SUB_EV	-4.36	-0.38	0.05%	299	-6.98	-0.42	0.03%	446
	PS_PAR_EV	56.90**	2.05	1.04%**	374	29.60	1.11	0.56%	248
	PS_SUB_EV	0.60	0.05	0.00%	297	21.28	1.15	0.34%	441
Profitability — Level	EAR/ASS_PAR_T+2	17.21	2.00	0.19%	526	133.03**	2.37	1.88%*	349
	EAR/ASS_SUB_T+2	35.91	2.47	0.65%	375	6.70***	3.02	0.22%	544
Profitability — Evolution	EBIT/REV_PAR_EV	40.2*	1.38	0.49%	356	9.42	0.34	0.05%	240
	EBIT/REV_SUB_EV	36.38**	1.85	1.41%*	268	56.98***	2.65	1.69%***	391
	EAR/ASS_PAR_EV	24.57	0.78	0.15%	397	55.36**	2.30	1.56%**	264
	EAR/ASS_SUB_EV	18.43	1.01	0.40%	306	38.88**	1.98	0.79%**	459
	EAR/REV_PAR_EV	-1.98	-0.07	0.00%	418	46.46**	2.03	1.44%**	285
	EAR/REV_SUB_EV	26.19*	1.55	0.85%	320	35.48*	1.89	0.86%**	477
Leverage — Level	DEBT_PAR_T-2	-0.05	-0.06	0.00%	526	-0.76**	-1.98	1.04%*	355
	DEBT_PAR_T-1	-0.44	-0.61	0.08%	568	-0.77**	-2.17	1.28%**	379
	DEBT_PAR_T+1	-0.89	-1.47	0.41%	549	-1.30***	-2.23	1.91%***	361
	DEBT_SUB_T+1	0.84*	1.33	0.84%*	362	-0.16	-0.46	0.08%	491
	DEBT_SUB_T+2	0.27	1.02	0.22%	331	-0.51*	-1.77	0.77%*	478
Leverage — Evolution	DEBT_PAR_EV	13.37	0.40	0.04%	365	-8.43	-0.52	0.11%	246
	DEBT_SUB_EV	-7.81	-0.40	0.06%	238	-40.52**	-2.49	1.91%***	353

		Parent				Subsidiary			
	Regressor (X)	Sensitivity	t-statistic	R^2	# of trx	Sensitivity	t-statistic	R^2	# of trx
Growth	REV_GRO_PAR_POST	-4.34	-0.13	0.00%	456	13.13	0.54	0.17%	313
	REV_GRO_SUB_POST	25.50	1.10	2.20%***	320	55.78***	1.52	4.27%***	478
	EAR_GRO_PAR_PRE	-10.69	-0.29	0.78%*	362	-29.04**	-1.45	2.18%**	241
	EAR_GRO_SUB_POST	25.54**	2.58	2.14%**	262	21.07*	1.70	0.79%*	387
Timing **Raw**	BHR_PAR_-3YEARS	-0.05***	-2.63	0.29%	406	-0.05***	-4.40	1.94%**	313
	BHR_PAR_-2YEARS	-0.12**	-2.42	0.23%	422	-0.14***	-2.67	1.44%**	322
	BHR_PAR_-1YEAR	-0.18*	-1.81	0.35%	435	-0.26***	-3.10	2.56%***	334
Ad-justed	BHAR_PAR_-3YEARS	-0.06**	-2.58	0.33%	401	-0.05***	-4.85	1.66%**	311
	BHAR_PAR_-2YEARS	-0.13**	-1.99	0.26%	422	-0.10**	-2.38	0.78%	322
	BHAR_PAR_-1YEAR	-0.19*	-1.66	0.39%	435	-0.22***	-2.89	1.63%**	334

Regression coefficients of OLS regressions for parents and subsidiaries buy and hold abnormal returns (BHARs) in the two years following the transaction on a set of explanatory variables (see Table 55); based on the sample of 563 spin-offs and 639 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; as not for all transactions data all regressors are available, the sample is partially smaller, US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and t the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level based on White heteroscedasticity-adjusted standard errors using a t-test for β; asterisks next to the R^2 values denote significance of the F-test.

The coefficients of price multiples show the expected positive signs for P/B- and P/S-ratios. That means that the higher the P/B- and the P/S-ratios in T+2, the higher the abnormal returns; if the P/B- and the P/S-ratio in T+3 is bigger than in T-1 (for parents) or T+1 (for subsidiaries), the abnormal return will be higher. In price-to-earnings ratios, the effects are mixed: While BHARs of parents and subsidiaries are significantly higher if the P/E ratios of parents in T+3 are higher than in T-1, the same are lower, the higher the P/E ratio of subsidiaries in T+2.

The profitability measures provide striking evidence that BHARs of parents as well as of subsidiaries are higher, the more profitable parents and subsidiaries are in T+2 and if they can improve their profitability subsequent to the transaction. Table 56 shows the significantly negative influence of the level of indebtedness. The higher the debt-to-assets ratio before or following the transaction, the lower the abnormal returns of parents and subsidiaries. Subsidiaries also perform worse if they increase their leverage subsequent to the transaction. Subsidiaries post-transaction revenues and earnings growth have a significantly positive influence on parents and subsidiaries BHARs. The results in Table 56 also provide strong evidence of the negative impact of market timing on post-transaction abnormal returns; there is a significantly negative effect of parents' earnings growth before the transaction on BHARs of parents as well as of subsidiaries.

Subsidiaries also perform worse, the higher the raw and adjusted returns of parents before the transaction.

5.5.10.2   Univariate Regressions on Spin-offs

The results obtained by regressing the BHARs from T to T+2 of parents and subsidiaries on the alternative regressors for 563 spin-offs are reported in Table 57. Out of the nine overall factors, PARENTS/SUB and GEOFOCUS (for parents as well as for subsidiaries), ANNOUNCE (for parents) and SIZE (for subsidiaries) have a statistically significant effect on two-year BHARs of spin-offs. The correlation coefficient between parents and subsidiary BHARs is 33.9% and the R^2 is 11.49%. ANNOUNCE has a significant influence on two-year BHARs of parents, which means that the higher the announcement effect, the higher the abnormal long-term returns of parent firms. Spin-off subsidiaries have lower BHARs the larger the size as compared to the parent firms' market capitalization. Parent as well as subsidiary companies involved in cross boarder spin-offs have lower BHARs than companies involved in domestic events, though the overall explanatory power of this factor is with R^2 values of 0.07% and 0.31% very limited.

The level and the evolution of price multiples has no clear influence on spin-off firms' BHARs; only PE_SUB_T+2 has a significant coefficient, surprisingly negative for parents (coefficient of -0.20 and R^2 of 30.5%) as well as for subsidiaries (coefficient of -0.26 and R^2 of 10.9%). PS_SUB_T+2 (PE_PAR_EV) in contrast has significantly positive effects on parents' (subsidiaries') BHARs. The profitability measures show the expected positive signs: The effect is significantly for parents based on EAR/ASS_PAR_T+2 and for subsidiaries based on EBIT/REV_SUB_EV and EAR/ASS_PAR_EV. The indebtedness measures show the expected negative sign indicating the negative influence of indebtedness on BHARs. The indebtedness of parents (in the year subsequent to the transaction) has a significant impact on parents (coefficient of –2.0 and R^2 of 1.4%) and subsidiaries BHARs (coefficient of –1.7 and an R^2 of 2.7%). The results in Table 57 also provide evidence on the negative impact of market timing on spin-off firms' BHARs. There is a negative effect of parents' earnings growth before the transaction on the post transaction abnormal stock market returns of parents as well as of subsidiaries. Parents and particularly subsidiaries perform significantly worse the higher the raw and adjusted returns of parents before the transaction.

Table 57: Long-term Stock Market: Univariate Analysis on BHARs of Spin-offs

		Parent				Subsidiary			
	Regressor (X)	Sensitivity	t-statistic	R^2	# of trx	Sensitivity	t-statistic	R^2	# of trx
Overall factors	REGION	6.97	0.30	0.01%	382	3.36	0.15	0.00%	281
	ANTIDIR	6.71	1.09	0.06%	381	-1.85	-0.24	0.00%	279
	SIZE	-0.00	-0.02	0.00%	277	-0.10**	-2.54	0.57%	195
	INDFOCUS	15.26	0.55	0.06%	373	-0.52	-0.02	0.00%	272
	GEOFOCUS	-42.02**	-2.47	0.07%	381	-61.49***	-2.63	0.31%	281
	ANNOUNCE	3.05**	1.87	1.52%**	353	-0.09	-0.15	0.00%	219
	PARENT/SUB	0.18***	1.12	11.49%***	212	0.63***	2.62	11.49%***	212
Price multiples Level	PB_PAR_T+2	-0.02	-0.22	0.00%	262	-0.10	-1.16	0.05%	163
	PB_SUB_T+2	-1.45	-1.33	1.27%	165	-1.04	-0.55	0.06%	196
	PE_PAR_T+2	0.03	0.90	0.02%	276	0.05	1.15	0.12%	168
	PE_SUB_T+2	-0.20***	-17.1	30.53%***	177	-0.26***	-9.43	10.92%***	203
	PS_PAR_T+2	5.36	1.26	0.36%	275	6.02	1.13	1.40%	168
	PS_SUB_T+2	0.15***	3.54	0.44%	176	0.02	0.23	0.00%	200
Evolution	PB_PAR_EV	42.02	0.75	0.27%	173	62.74	1.38	1.29%	102
	PB_SUB_EV	-35.94	-1.62	1.91%	129	14.95	0.36	0.09%	156
	PE_PAR_EV	86.15	1.62	1.22%	185	81.38*	1.88	2.40%	111
	PE_SUB_EV	-2.25	-0.10	0.01%	138	-13.74	-0.36	0.08%	161
	PS_PAR_EV	78.20	1.39	1.00%	184	-12.50	-0.22	0.06%	111
	PS_SUB_EV	-12.06	-0.52	0.22%	136	13.09	0.32	0.07%	157
Profitability Level	EAR/ASS_PAR_T+2	162.56**	2.35	0.57%	273	108.31	1.51	0.40%	166
	EAR/ASS_SUB_T+2	39.88	1.43	0.44%	175	-50.13	-0.50	0.22%	204
Evolution	EBIT/REV_PAR_EV	62.79	1.13	0.64%	184	-24.87	-0.49	0.23%	113
	EBIT/REV_SUB_EV	54.52	1.48	1.70%	126	101.65**	2.21	3.28%**	141
	EAR/ASS_PAR_EV	65.64	1.23	0.75%	201	74.22*	1.72	2.16%	119
	EAR/ASS_SUB_EV	36.10	1.08	0.83%	141	28.41	0.74	0.29%	167
	EAR/REV_PAR_EV	-45.51	-0.97	0.37%	209	38.12	0.82	0.60%	126
	EAR/REV_SUB_EV	46.40	1.47	1.45%	150	41.95	1.10	0.66%	173
Leverage Level	DEBT_PAR_T-2	-1.43*	-1.85	0.54%	274	-0.01	-1.36	0.83%	172
	DEBT_PAR_T-1	-1.74	-1.39	0.89%	303	-0.81	-1.24	0.65%	186
	DEBT_PAR_T+1	-1.96*	1.90	1.54%**	285	-1.74*	-1.72	2.65%**	173
	DEBT_SUB_T+1	0.10	0.18	0.02%	175	-0.08	-0.11	0.02%	197
	DEBT_SUB_T+2	0.10	0.22	0.02%	155	-0.42	-0.75	0.37%	182
Evolution	DEBT_PAR_EV	40.47	0.79	0.26%	181	-21.15	-1.00	0.99%	110
	DEBT_SUB_EV	11.42	0.29	0.07%	116	-47.17	-1.47	1.60%	135
Growth	REV_GRO_PAR_POST	17.46	0.57	0.10%	234	4.19	0.20	0.02%	144
	REV_GRO_SUB_POST	100.59**	2.36	9.27%***	149	155.91***	3.07	11.61%***	172

		Parent				Subsidiary			
		Sensitivity	**t-statistic**	**R^2**	**# of trx**	**Sensitivity**	**t-statistic**	**R^2**	**# of trx**
		Regressor (X)							
		EAR_GRO_PAR_PRE	-15.88	-0.68	1.27%	199	-31.99	-0.99	1.73%	125
		EAR_GRO_SUB_POST	27.29**	2.07	2.02%	127	5.98	0.45	0.06%	144
Timing	**Raw**	BHR_PAR_-3YEARS	-0.07	-0.71	0.22%	232	-0.08**	2.05	1.80%	150
		BHR_PAR_-2YEARS	-0.10	-0.63	0.17%	242	-0.14**	-2.25	2.00%*	155
		BHR_PAR_-1YEAR	-0.14	-0.80	0.26%	246	-0.27***	-2.63	3.40%**	158
	Ad-justed	BHAR_PAR_-3YEARS	-0.06	-0.60	0.16%	229	-0.07*	-1.97	1.44%	148
		BHAR_PAR_-2YEARS	-0.07	-0.46	0.09%	242	-0.12**	-2.06	1.33%	155
		BHAR_PAR_-1YEAR	-0.13	-0.72	0.21%	246	-0.23**	-2.59	2.37%*	158

Regression coefficients of OLS regressions for parents and subsidiaries buy and hold abnormal returns (BHARs) in the two years following the transaction on a set of explanatory variables (see Table 55); based on the sample of 563 spin-offs occurring between January 1990 and April 2003 in the USA and Europe; as not for all transactions data all regressors are available, the sample is partially smaller, US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and t the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level based on White heteroscedasticity-adjusted standard errors using a t-test for β; asterisks next to the R^2 values denote significance of the F-test.

5.5.10.3 Univariate Regressions on Carve-outs

Table 58 shows the results of OLS regressions of two-years BHARs of parents and subsidiaries on the alternative regressors for 639 carve-outs. PARENT/SUB, INDEP, and ANNOUNCE are the three overall factors that have a significant influence on BHARs of carve-outs. The estimated coefficients of PARENTS/SUB BHARs are positive but rather low. This is a result of the small correlation coefficient of 8.4% between parents and subsidiary BHARs in carve-outs, which is much smaller than the one of spin-offs with 33.9%. INDEP shows a strong impact on subsidiaries abnormal returns with a sensitivity of 62.9% (t-statistic of 3.4) and R^2 of 7.5%, but no significant impact on parent BHARs. The significantly negative intercepts of ANNOUNCE shows the wrong anticipation of stock market participants of the future abnormal long-term returns of carve-out parents as well as of carve-out subsidiaries at the announcement.

The price multiples and profitability measures provide striking evidence that BHARs of parents, as well as of subsidiaries, are higher (1) the higher the price multiples; (2) if price multiples improve, (3) the more profitable firms are and (4) if the profitability improves. These findings are robust, as they are found in all three price multiples and all three profitability measures. The evidence on the indebtedness, in contrast, is more complex. Parent BHARs are higher when subsidiary firms have more leverage. This indicates that parents perform better, the more debt they shift to the subsidiary. The

indebtedness of the subsidiary in T+2, on the other hand, has as expected a negative influence on subsidiaries BHARs.

Table 58: Long-term Stock Market: Univariate Analysis on BHARs of Carve-outs

		Regressor (X)	Parent				Subsidiary			
			Sensitivity	t-statistic	R^2	# of trx	Sensitivity	t-statistic	R^2	# of trx
Overall factors		REGION	-2.60	-0.16	0.00%	334	7.88	0.81	0.07%	443
		ANTIDIR	-0.76	0.36	0.00%	333	1.40	0.30	0.02%	434
		SIZE	-0.09	-1.04	0.06%	270	-0.13	-1.49	0.44%	201
		INDFOCUS	-32.17	-0.96	0.61%	293	8.51	0.68	0.12%	400
		GEOFOCUS	66.69	1.19	1.86%**	330	-13.05	-0.98	0.15%	442
		ANNOUNCE	-2.22*	1.81	1.71%**	241	-1.45**	-2.21	1.87%*	184
		PARENT/SUB	0.16**	2.34	0.70%	219	0.04	0.94	0.70%	219
		INDEP	-28.35	-1.05	0.25%	169	62.92***	3.37	7.47%***	214
Price multiples	Level	PB_PAR_T+2	4.21	1.09	0.89%	220	-0.98	-0.53	0.10%	162
		PB_SUB_T+2	0.96	0.99	2.04%**	193	3.41**	2.11	4.01%***	331
		PE_PAR_T+2	0.33	0.82	1.53%**	259	-0.01	-0.22	0.00%	187
		PE_SUB_T+2	0.07	1.12	0.73%	199	0.07	1.58	0.39%	340
		PS_PAR_T+2	19.60**	2.48	57.13%***	258	-0.67	-1.54	0.17%	186
		PS_SUB_T+2	-0.04	-0.11	0.02%	199	0.24	0.46	0.09%	339
	Evolution	PB_PAR_EV	67.14*	1.89	1.90%*	177	39.49**	2.05	3.28%**	127
		PB_SUB_EV	0.49	0.05	0.00%	156	-11.03	-0.74	0.19%	277
		PE_PAR_EV	48.35	1.36	1.06%	192	37.49**	2.03	3.04%**	139
		PE_SUB_EV	-8.28	-0.91	0.49%	161	-2.86	-0.20	0.01%	285
		PS_PAR_EV	38.10***	4.22	8.40%***	190	64.01***	3.83	8.74%***	137
		PS_SUB_EV	-2.36	-0.26	0.04%	161	20.43	1.31	0.66%	284
Profitability	Level	EAR/ASS_PAR_T+2	11.74**	2.53	0.32%	253	142.51*	1.80	2.53%**	183
		EAR/ASS_SUB_T+2	37.51***	4.02	3.10%**	200	7.02	2.60	0.77%	340
	Evolution	EBIT/REV_PAR_EV	16.34	1.63	1.51%	172	39.79	1.57	1.90%	127
		EBIT/REV_SUB_EV	10.84	0.99	0.73%	142	27.03	1.44	0.90%	250
		EAR/ASS_PAR_EV	-16.38	-0.48	0.12%	196	37.53	1.62	1.81%	145
		EAR/ASS_SUB_EV	-8.80	-0.93	0.45%	165	33.97*	1.87	1.50%**	292
		EAR/REV_PAR_EV	45.77	1.53	1.03%	209	55.53***	2.62	4.04%**	159
		EAR/REV_SUB_EV	0.41	0.04	0.00%	170	23.92	1.44	0.79%	304
Leverage	Level	DEBT_PAR_T-2	1.34	1.08	1.29%*	252	-0.67**	-2.33	1.20%	183
		DEBT_PAR_T-1	0.84	1.20	0.63%	265	-0.73*	-1.94	1.31%	193
		DEBT_PAR_T+1	0.46	0.72	0.17%	264	-0.90*	-1.87	1.53%*	188
		DEBT_SUB_T+1	1.62	1.22	2.13%**	187	-0.27	-1.01	0.35%	294
		DEBT_SUB_T+2	0.20	0.98	0.56%	176	-0.58*	-1.96	1.41%**	296

	Regressor (X)	Parent				Subsidiary			
		Sensitivity	t-statistic	R^2	# of trx	Sensitivity	t-statistic	R^2	# of trx
Evolu-tion	DEBT_PAR_EV	-20.70	-0.64	0.19%	184	1.05	0.04	0.00%	136
	DEBT_SUB_EV	-20.41**	-2.27	4.17%**	122	-32.41**	-2.01	2.08%**	218
Growth	REV_GRO_PAR_POST	-183.21	-0.79	4.26%***	222	62.01*	1.78	1.62%*	169
	REV_GRO_SUB_POST	4.23	1.61	0.44%	171	26.84	1.51	2.43%***	306
	EAR_GRO_PAR_PRE	2.32	0.39	0.10%	163	-18.00*	-1.84	3.22%*	116
	EAR_GRO_SUB_POST	8.86	1.42	0.70%	135	44.22*	1.73	3.46%***	243
Timing Raw	BHR_PAR_-3YEARS	-0.04**	-2.44	0.47%	174	-0.05***	-5.61	2.26%*	163
	BHR_PAR_-2YEARS	-0.15	-1.10	0.40%	180	-0.12	-1.45	0.69%	167
	BHR_PAR_-1YEAR	-0.41	-1.44	0.88%	189	-0.26*	-1.87	1.72%*	176
Ad-justed	BHAR_PAR_-3YEARS	-0.05**	-1.99	0.70%	172	-0.04***	-6.35	1.97%*	163
	BHAR_PAR_-2YEARS	-0.23	–1.10	0.96%	180	-0.05	-0.66	0.13%	167
	BHAR_PAR_-1YEAR	-0.60*	-1.28	1.77%*	189	-0.20	-1.46	0.94%	176

Regression coefficients of OLS regressions for parents and subsidiaries buy and hold abnormal returns (BHARs) in the two years following the transaction on a set of explanatory variables (see Table 55); based on the sample of 639 carve-outs occurring between January 1990 and April 2003 in the USA and Europe; as not for all transactions data all regressors are available, the sample is partially smaller, US (European) transactions adjusted for the SP500 (DJ STOXX); T denotes the execution date and t the announcement date; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level based on White heteroscedasticity-adjusted standard errors using a t-test for β; asterisks next to the R^2 values denote significance of the F-test.

Subsidiaries post-transaction revenues and earnings growth have a significantly positive influence on subsidiaries BHARs. As already documented for all transactions and spin-offs, Table 58 also provides strong evidence on the negative impact of market timing on BHARs: There is a significantly negative effect of parents earnings growth before the transaction on the post transaction abnormal stock market returns of subsidiaries. Parents and particularly subsidiaries BHARs are also lower the higher the raw and adjusted returns of parents before the transaction.

5.5.10.4 Multivariate Regressions on Spin-offs

Table 59 (Table 60) report multivariate cross-sectional regressions of spin-offs (carve-outs) parent and subsidiary BHARs. The intercepts of multiple regressions of spin-off parents are not significant while the ones of spin-off subsidiaries are (mostly significantly) positive. This confirms the stable positive value creation of spin-off subsidiaries in the long run. For both parents as well as subsidiaries there is a stable positive influence of parent BHARs on subsidiary BHARs and vice versa and the subsidiary revenues growth subsequent to the transaction on BHARs. The long-term stock market performance is better for domestic spin-offs than for cross-boarder transactions. The adjusted

R^2 of the multiples regressions are higher for parent BHARs (up to 25.4%) than for sub-
sidiary BHARs (up to 17.9%). The highest adjusted R^2 of 25.4% is found for spin-off
parent firms using PARENT_SUB and REV_GRO_SUB_POST.

Table 59: Long-term Stock Market: Multivariate Analysis on BHARs of Spin-offs

	Parents				Subsidiaries					
Intercept	13.0	-37.3	-2.9	9.3	32.9**	115.9**	27.4*	13.9	21.4	-1.7
REGION		-28.8			0.7	29.4				
ANTIDIR		10.4				-18.8				
SIZE		0.0				-0.1*				
INDFOCUS		34.2*				-25.9				
GEOFOCUS	-46.2**	-51.8**			-61.3**	-2.5				
ANNOUNCE	3.1	-1.2				1.9**				
PARENT/SUB		0.2	0.1			0.6**		0.8***	0.5*	0.7***
PB_SUB_EV				-26.3				57.5		
EBIT/REV_SUB_EV										91.1
REV_GRO_SUB_POST			84.5*	102.5**			76.5		122.9**	
BHR_PAR_-1YEAR							-0.5			
Number of transactions	352	162	126	129	281	162	79	114	126	107
Adjusted R^2	**1.0***	**8.1****	**25.4***	**23.3***	**-0.4**	**5.8****	**6.2****	**12.4***	**17.9***	**14.7***
F-Statistic	2.9	3.0	22.3	20.4	0.4	2.4	3.6	9.0	14.6	10.1

Cross sectional OLS regressions on parents and subsidiaries BHARs in the two years following the transaction on a set of
explanatory variables; based on the sample of 563 spin-offs occurring in the USA and Europe between January 1990 and April
2003 for which data is available; as not for all transactions data all regressors are available, the sample is partially smaller, US
(European) transactions adjusted for the SP500 (DJ STOXX); *, **, ***: Significance at the 10%-, 5%- and 1%-level, based on
White heteroscedasticity-adjusted standard errors adjusted t-test for β.

5.5.10.5   Multivariate Regressions on Carve-outs

Table 60 reports the multivariate tests of carve-out parent and subsidiary long-term
BHARs. The mostly significantly negative intercepts of carve-out parents and subsidiar-
ies in the multiple regressions validate the value destruction of carve-outs in the long
run. The evolution of the parents' price-to-sales ratios from T-1 to T+3 shows a positive
and significant impact on parents as well as on subsidiaries BHARs. The multivariate
regressions taking into account all overall factors have no significant explanatory power
(F-statistic of 1.5 for parents and 1.9 for subsidiaries). The long-term abnormal returns
are rather explained by (1) the increase of price multiples, (2) the improvement of oper-
ating performance measures and (3) by market timing. For carve-out subsidiaries INDEP
is the key variable in explaining the long-term BHARs. The coefficients of INDEP lie

between 55.4% and 68.3% in all multiple regressions, which is reasonably consistent and economically and statistically very significant.

Table 60: Long-term Stock Market: Multivariate Analysis on BHARs of Carve-outs

	Parents				Subsidiaries					
Intercept	-28.0	83.6	-44.5***	-21.6***	-17.9	-10.0	-17.0	-52.8***	-28.7**	-65.7***
REGION	7.0	59.1			9.5	17.1				
ANTIDIR		-9.3			-0.6	-6.7				
SIZE		0.1			10.0	0.0				
INDFOCUS		-122.3			-5.3	1.0				
GEOFOCUS	68.3	241.7				8.5				
ANNOUNCE		-5.3				-1.0				
PARENTS/SUB		0.2				0.0	0.5***			
INDEP		-32.1				63.2***		67.4***	55.4***	65.5***
PS_PAR_EV			41.2***	41.8***			44.1**			32.6**
PE_PAR_EV										
EAR/REV_PAR_EV								50.3***		42.5***
REV_GRO_PAR_POST			73.9***	88.8**						
EAR_GRO_SUB_POST									64.2	
BHAR_PAR_-1 year				-0.6**						
Number of transactions	330	96	189	94	395	96	134	91	121	85
Adjusted R²	**1.3****	**4.2**	**13.2****	**17.8****	**-0.8**	**7.3***	**17.0****	**23.6****	**14.5****	**24.7****
F-Statistic	3.2	1.5	15.3	7.7	0.3	1.9	14.6	14.9	11.2	10.2

Cross sectional OLS regressions on parents and subsidiaries BHARs in the two years following the transaction on a set of explanatory variables; based on the sample of 639 carve-outs occurring in the USA and Europe between January 1990 and April 2003 for which data is available; as not for all transactions data all regressors are available, the sample is partially smaller, US (European) transactions adjusted for the SP500 (DJ STOXX); *, **, ***: Significance at the 10%-, 5%- and 1%-level, based on White heteroscedasticity-adjusted standard errors adjusted t-test for β.

5.5.11 Summary and Appraisal of Results

This Section tests the long-term stock market value creation of 563 spin-offs and 639 carve-outs occurring in the USA and Europe between 1990 and 2003. Even though spin-offs and carve-outs experience a similar announcement effect, there are substantial differences in the long-term stock market performance between spin-offs and carve-outs: While the average spin-off firm outperforms the market, carve-outs underperform the market considerably. Spin-off parents (subsidiaries) show robustly positive average buy and hold abnormal returns (ABHARs) of 7.7% (18.9%), 17.3% (30.9%), 15.9% (55.8%)

and 23.5% (74.2%) for the overlapping one-, two-, three- and four year periods. Carve-out parents (subsidiaries), in contrast, exhibit robustly negative ABHARs of -8.8% (8.2%), -11.8% (-7.9%), -34.3% (-17.2%) and –40.4% (-14.7%) for the respective periods. Only in the first year subsequent to the issue, carve-out subsidiaries exhibit positive ABHARs.

The difference in abnormal returns between spin-off and carve-out subsidiaries is 10.7%, 38.8%, 73.0% and 88.8%. The respective differences for parent firms are 16.5% 29.1%, 50.2% and 63.9%. Hence there is striking evidence to support the overall hypothesis "H1", that spin-offs create more value than carve-outs; this is found in European as well as in US transactions. The differences between the long-term stock market performance of spin-off and carve-out firms are very robust: No matter which methodology for the calculation of abnormal and expected returns is used, spin-offs create abnormal long-term value, whereas carve-outs destroy value. The stability of the effect over time is also investigated separately for each year in the sample period. From this perspective as well, spin-off firms perform much better than carve-out firms.

The evidence on "H2", that the value creation of spin-offs and carve-outs is similar in Europe and in the USA, is mixed. Analyzing ABHARs, there are indeed no significant differences; in MBHARs, however, European firms perform significantly better than US firms do. Analyzing the long-term stock market effects of transactions in individual European countries shows that parents, as well as subsidiaries resulting from carve-outs, also show negative long-term abnormal returns subsequent to the transaction. Based on this analysis, the finding that carve-out firms destroy value in the years following the transaction is supported as well. The evidence on the long-term abnormal performance of spin-offs in individual European countries shows that there are, with Sweden, Switzerland, France and Finland, more countries with a substantial positive effect than countries with a substantial negative effect (only Germany). The hypothesis "H2d", that the value creation in the long run is similarly in countries with a low and a high level of shareholder protection, is supported, as the shareholder protection level and the origin of the law are not key drivers for the long-term abnormal stock market returns.

Figure 15: Long-term Stock Market: Overview on Hypotheses Tested

Hypothesis tested empirically:		S: Spin-offs	
▥ Strong support (not rejected)		C: Carve-outs	
▥ Medium support			
▢ Low/no support (rejected)			**Long-term Stock Market Effects**
	Hypothesis	**Operationalization**	
Type of transaction	**H1** Spin-offs create more value than carve-outs	H1a Spin-offs increase the firm value in the long-run more than carve-outs	�
		H1b European spin-offs increase the firm value in the long-run more than European carve-outs	▉
		H1c US spin-offs increase the firm value in the long-run more than US carve-outs	▉
Place of transaction	**H2** The value creation of spin-offs and carve-outs is similar in Europe and in the USA	H2a European transactions increase the firm value in the long run similar to US transactions	▤
		H2b European spin-offs increase the firm value in the long-run similar to US spin-offs	▤
		H2c European carve-outs increase the firm value in the long-run similar to US carve-outs	▤
		H2d The value creation of spin-offs and carve-outs in the long-run does not differ significantly depending on the origin of law and/or the level of shareholder protection	▉
Pillar 1: **Strategic Business Portfolio Restructuring**	**H5** Industrial Focus	H5 Firms involved in spin-offs and carve-outs that improve the industrial focus increase the firm value in the long-run more than firms involved in non-industrial focus increasing transactions	S C
	H6 Geographical Focus	H6 Firms involved in spin-offs and carve-outs that improve the geographical focus increase the firm value in the long-run more than firms involved in non-geographical focus increasing transactions	S C
	H7 Incentive Alignment	H7 Subsidiary firms increase the firm value in the long-run more than their parent firms	S C
	H8 Independence of Subsidiary	H8 Subsidiary firms resulting from spin-offs or from carve-outs with a high free float increase the firm value in the long-run more than subsidiary firms depending on other firms	▉
	H9 Size	H9b The value creation in the long run is lower in transactions, where the value of the subsidiary company is relatively large as compared to the value of the parent company	S C
Pillar 2: **Timing & Financing Needs**	**H10** Stock Market Timing	H10a Firms undertake spin-offs and carve-outs after bull markets	▉
		H10b Stock market returns of carve-out firms before the transaction are substantially higher than after the transaction. There is no such difference between pre- and post transaction stock market returns of spin-off firms	▉
		H10c Pre-transaction stock market performance of parent firms is better than the overall market for carve-out firms and worse for spin-off firms	▤

The Industrial Focus Hypothesis "H5" is rejected, as the higher value creation of indus-trial focus-increasing transactions is covered by the difference in the announcement ef-fect and there is no additional long-term effect. The Geographical Focus Hypothesis "H6" is denied as well, as there are no significant differences between cross-boarder and domestic spin-offs and carve-outs, neither at the announcement nor in the long run. Making the distinction between parents' and subsidiaries' long term BHARs shows that subsidiaries in both spin-offs and carve-outs perform better than their parent firms. However, evidence on the Incentive Alignment Hypothesis "H7" is mixed, as the differ-ences are mostly insignificant. Regarding the influence of the relative size of the trans-actions, this study provides evidence for significant differences in the first year subse-quent to the transaction. However, as the effect disappears in the long run, the Relative Size of Transaction Hypothesis "H9" is rejected.

Strategic business portfolio restructuring (Pillar 1) and Timing & Financing Needs (Pil-lar 2) are the two pillars of rationales explaining the different value creation of spin-offs and carve-outs. Outsiders' Information Asymmetry Reduction (Pillar 3), in contrast, has no substantial influence on the value creation of spin-offs and carve-outs. The benefits of independent subsidiaries are one of the key explanations for the better performance of spin-offs as compared to carve-outs. Carve-out subsidiaries that are still dependent on the parent or another firm show a significant long-term underperformance. Independent carve-out subsidiaries with a free float larger than 75%; in contrast, outperform the mar-ket by 11.3%, 37.8%, 50.6% and 22.9% in the four overlapping periods subsequent to the event. The Independence of Subsidiary Hypothesis "H8" is also supported by the results of the OLS regressions. Another important factor explaining the superiority of spin-offs (as compared to carve-outs) is market timing by managers. The empirical evi-dence robustly supports the Stock Market Timing Hypothesis "H10". "H10a" is sup-ported, as managers prefer to undertake not only carve-outs after overall bull markets, but also spin-offs, as managers want to have a positive stock market environment for their subsidiary. The results indicate that carve-out managers deliberately choose a spe-cific point of time for their transaction, exploiting a window of opportunity for cheap external equity financing. In line with "H10b", market returns of carve-out companies before the transaction are substantially higher than returns after the transaction. There is no such difference between pre- and post-event returns of spin-off firms.

Cross sectional regressions show that the relative valuation and the operating perform-ance are additional key drivers of long-term abnormal stock market performance of spin-off and carve-out firms. The results of the cross sectional regressions also provide evi-

dence to confirm the negative impact of market timing on post-transaction abnormal returns, with a negative effect of parents' earnings growth before the transaction on long-term BHARs. Firms also perform worse, the higher the raw and adjusted returns of parents before the transaction. Hence, one can conclude that investors underestimate the benefits of spin-offs on the business of involved firms, and overestimate the ones of carve-outs, rationalizing the differences in long-term stock market value creation.

5.6 Price Multiples Effects

In this Section, changes in price multiples following spin-offs and carve-outs are examined. The change in P/E, P/B and P/S ratios is measured in the three years around the transaction (from year T–1, the fiscal year prior to the transaction, to T+1, the fiscal year after the transaction) and the three years afterwards (from year T+1 to year T+3). Overall, P/E multiples investigated are relatively low compared to other studies. This might be influenced by the definition used in this paper (e.g.; incl. minority interests) and by the fact that no forward-looking multiples are used, but rather multiples that are calculated based on accounting figures. However, when the multiples pre- and post-transaction are compared, the absolute levels have no influence on the results. As outlined in Section 2.6, the operating performance and hence also the price multiples in T are distorted, in that carve-outs' gain (the difference between the public offering price and the book value in the parent's book) can be either booked on the income statement or on the shareholders equity.

5.6.1 Type of Transaction: Spin-offs vs. Carve-outs

In the year following the transaction, carve-out subsidiaries exhibit high P/E, P/B and P/S ratios relative to their parents and also relative to the typical spin-off subsidiary or parent firm (Table 61).

Table 61: Price Multiples: Spin-offs and Carve-outs

	Parent			Subsidiary		Difference in median			
						Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
	T-1	T+1	T+3	T+1	T+3				
P/E **Spin-offs**	**13.5**	**12.9**	**14.1**	**12.3**	**13.2**	**-0.6**	**-1.2**	**1.2**	**0.9**
EU spin-offs	14.3	11.4	12.1	11.3	12.0	-2.8	-3.0	0.6	0.7
US spin-offs	13.2	13.3	15.3	12.5	14.3	0.1	-0.7	2.0	1.8
Carve-outs	**14.5**	**12.1**	**11.9**	**13.8**	**13.0**	**-2.4**	**-0.7**	**-0.2**	**-0.8**
EU carve-outs	18.9	15.3	9.1	15.1	11.3	-3.6	-3.8	-6.3	-3.8
US carve-outs	13.0	11.0	12.2	13.3	13.1	-2.1	0.3	1.2	-0.2
P/B **Spin-offs**	**1.69**	**1.89**	**1.89**	**1.77**	**1.69**	**0.20****	**0.07**	**0.00**	**-0.08**
EU spin-offs	1.33	1.53	1.39	1.38	1.30	0.20**	0.04	-0.13	-0.08
US spin-offs	1.81	2.09	2.01	1.81	1.77	0.28***	0.00**	-0.08	-0.04
Carve-outs	**1.93**	**1.66**	**1.73**	**2.21**	**1.93**	**-0.28**	**0.28*****	**0.07**	**-0.28*****
EU carve-outs	2.27	1.86	1.26	2.25	2.41	-0.40	-0.01	-0.61***	0.15***
US carve-outs	1.79	1.63	1.83	2.20	1.82	-0.16	0.41**	0.20**	-0.38***
P/S **Spin-offs**	**1.06**	**0.96**	**0.86**	**1.00**	**1.03**	**-0.10**	**-0.06**	**-0.10**	**0.03**
EU spin-offs	0.76	0.84	0.83	0.95	1.10	0.08	0.19	-0.01	0.15
US spin-offs	1.24	1.01	0.87	1.03	0.98	-0.23	-0.21	-0.14	-0.05
Carve-outs	**0.96**	**0.94**	**0.88**	**1.32**	**0.95**	**-0.02**	**0.36*****	**-0.06**	**-0.38*****
EU carve-outs	1.03	0.92	0.75	1.52	0.86	-0.11	0.49**	-0.17*	-0.66***
US carve-outs	0.95	0.95	0.99	1.29	0.96	-0.01	0.34***	0.04	-0.33***

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test.

The median carve-out subsidiary P/E (P/B) ratio in the year following the transaction is 13.8 (2.2). In contrast, the median P/E (P/B) ratio of their parents is 12.1 (1.7) and the ones of spin-off parents are 12.9 (1.9) and 12.4 (1.8) for spin-off subsidiaries. This finding confirms the results of Schipper and Smith (1986), Vijh (2002), and Powers (2003), which found that carved-out subsidiaries' P/E and P/B ratios tend to exceed the corresponding ratios of their parent firms. This indicates that the market expects higher future growth rates of the carved-out subsidiaries than of the parent firms. However, the evolution of price multiples of carved-out subsidiary firms shows that the three price multiples drop considerably starting in the first year after the carve-out. In the fifth year after the transaction, they are on a similar level as the ones of their parents and of spin-off subsidiaries.[184] This means that the median price multiples of carve-out subsidiaries

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[184] For more details, see Table 81 in the appendix.

peak in the year after the transaction.[185] The median P/E ratio decreases from 13.8 in the fiscal year subsequent to the transaction, to 12.9 four years later. The median P/B falls from 2.2 to 1.3. The same effect can be found in the P/S ratio. Immediately following the transaction, the market capitalization of carved-out subsidiaries is 32% higher than their sales. Five years later it is only 80% of the sales. These declines are significant in both economic and statistical terms and are larger than the corresponding declines for their parents, which can increase their P/E ratio from 12.1 to 14.3. The declines in carve-out subsidiaries price multiples are also significant (from T+1 to T+3). All three price multiples of carve-out subsidiaries in both USA and Europe decline substantially (for P/B and P/S highly significant) from T+1 to T+3. These results indicate that over-all, there seems to be no strategic gains yielding in constantly higher price multiples for carve-out firms, and that the high growth expectations of carved-out subsidiaries vanish in the years following the transactions.

Table 62 shows that while there are no significant differences between spin-off and carve-outs firms' price multiples before the transaction, there is one afterwards; spin-offs parents have higher P/E, P/B and P/S ratios than carve-out parent firms. Carve-out sub-sidiaries, in contrast, have (mostly significantly) higher price multiples than spin-off subsidiaries. Spin-off parents, as well as subsidiaries, however, can improve the price multiples significantly more than carve-out firms. In spin-offs, both parents, as well as subsidiaries, have higher P/B ratios directly following the transaction than the parent had in the previous year. P/Es are slightly lower, while P/S ratios are on the same level. In the subsequent two years spin-offs can improve their P/E ratios and keep the P/B and the P/S on the same level as compared to the pre-transaction level. Therefore, this evidence supports "H1", that spin-offs increase the relative valuation more than carve-outs. How-ever, the fact that price multiples for spin-offs improve only slightly and those of carve-outs decline subsequent to the transaction leads only to weak support of "H4" for spin-offs and the rejection of "H4" for carve-outs.

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[185] Similar effects can be found for SEOs firms, as documented in Loughran and Ritter (1997).

Table 62: Price Multiples: Differences between Spin-offs and Carve-outs

	Parent			Subsidiary		Difference in median			
						Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
	T-1	T+1	T+3	T+1	T+3				
P/E H1a Diff. spin and carve	**-1.0**	**0.8**	**2.2****	**-1.5**	**0.2**	**1.8***	**-0.5**	**1.4**	**1.7**
H1b Diff. EU spin and EU carve	-4.6***	-3.9	3.0	-3.8	0.8	0.7***	0.8	6.9	4.6
H1c Diff. US spin and US carve	0.1	2.3	3.1*	-0.8	1.2	2.2	-1.0	0.8	2.0
P/B H1a Diff. spin vs. carve	**-0.24**	**0.23**	**0.16**	**-0.45*****	**-0.25**	**0.47*****	**-0.21**	**-0.07**	**0.20*****
H1b Diff. EU spin and EU carve	-0.94***	-0.34**	0.14	-0.88***	-1.11**	0.60	0.06*	0.47**	-0.23***
H1c Diff. US spin and US carve	0.02	0.46**	0.18	-0.38	-0.05	0.44***	-0.40	-0.28	0.34
P/S H1a Diff. spin vs. carve	**0.10**	**0.02**	**-0.02**	**-0.33*****	**0.08**	**-0.08**	**-0.42****	**-0.04**	**0.41*****
H1b Diff. EU spin and EU carve	-0.27***	-0.08***	0.08	-0.57***	0.23*	0.19	-0.30	0.16	0.81***
H1c Diff. US spin and US carve	0.29*	0.07	-0.12	-0.26	0.02	-0.22	-0.55	-0.18	0.28
P/E H2b Diff. EU spin and US spin	1.1	-1.8	-3.2*	-1.2	-2.2	-2.9	-2.3	-1.4	-1.1
H2c Diff. EU carve and US carve	5.9***	4.4**	-3.1	1.8	-1.8	-1.5	-4.0	-7.5	-3.6
P/B H2b Diff. EU spin and US spin	-0.48*	-0.56***	-0.62***	-0.44*	-0.48	-0.08***	0.04	-0.05	-0.04
H2c Diff. EU carve and US carve	0.48**	0.24	-0.57***	0.06	0.59**	-0.24*	-0.42	-0.81***	0.53**
P/S H2b Diff. EU spin and US spin	-0.48***	-0.17	-0.04	-0.08	0.12	0.31	0.40	0.14	0.20*
H2c Diff. EU carve and US carve	0.08	-0.03	-0.24	0.23	-0.10*	-0.11	0.15	-0.21*	-0.33**

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date, "Par" denotes parents, "Sub" subsidiaries, "Diff" differences, "spin" spin-offs, and "carve" carve-outs; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test and the two sample Mann-Whitney test.

5.6.2 Place of Transaction: European vs. US Transactions

Comparing price multiples of parent and subsidiary firms involved in European and US transactions shows that overall, US spin-off firms exhibit higher price multiples than European spin-offs firms, while the multiples for US and European carve-out firms are similar. In the year of the spin-off, there are higher P/E multiples and lower P/S and P/B multiples for European firms than for US spin-off firms. Already in the following year, US firms involved in spin-offs can substantially increase their P/E ratio and show a higher P/E ratio than European spin-offs firms.[186] They are able to increase their P/E

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[186] Anslinger, Klepper, and Subramaniam (1999) documented that the P/Es of parent firms of US spin-offs as well as of US carve-outs increase in the two years around the transaction. The results in this study support the findings for spin-offs. However, contrary to the results of Anslinger, Klepper, and Subramaniam

ratio up to three years following the transaction. The price-to-sales and the price-to-book multiples of US spin-off parents and subsidiaries are stable in subsequent years, while these ratios decline for European spin-off parents and subsidiaries.

Comparing European and US parent carve-out firms in the year of the transaction shows that European carve-out firms have higher price multiples than US carve-out firms.[187] European firm exhibit higher P/Es (14.1 vs. 10.6), higher P/Bs (1.95 vs. 1.76) and higher P/S-ratios (1.14 vs. 0.98). Both European as well as US carve-outs can increase their Price/Earnings ratios in the year after the transaction; while the multiples of parents as well as subsidiaries of European carve-outs consequently decline, US parents can even increase their ratios from 11.0 in the year of the carve-out to 14.7 five years later. European parent firms also suffer in terms of price-to-book multiple: while the market value of the firm directly following the transaction is almost twice its book equity, the market capitalization is less than the book equity five years later. US parent firms, on the contrary, are able to maintain their 1.6 price-to-book valuations.

Table 62 shows that the better evolution of price multiples of US spin-off and carve-out firms (as compared to the evolution of price multiples of European firms involved in spin-offs and carve-outs) is mostly statistically significant for P/B and P/S ratios. Based on this evidence, "H2" can be rejected, as US firms show a better evolution of price multiples than European firms.

5.6.3 Robustness

Another way to assess the impact of the transaction is the regression of the median price multiple in the three post-transaction years on the corresponding median price multiple of the three years before the transaction for the same company. The slope coefficient β captures any correlation in price multiples between the pre- and post-transaction years. The intercept α is independent of any pre-transaction returns and captures the improvement in the median prices multiples and is therefore the abnormal post-transaction performance. Applying this approach, one finds positive intercepts for spin-offs as well as

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(1999), this study finds a negative change in the P/E multiple of carve-out parents. The difference can be explained by the limited data sample of Anslinger, Klepper, and Subramaniam (1999), which used 21 carve-outs and also a different methodology as they used marked adjusted figures.

[187] For more details, see Table 81 in the appendix.

for carve-outs in all three price multiples. However, with t-statistics around or even be-low 1.0, these positive intercepts that represent the improvement in the price multiples are not statistically significant on a 90% level. Hence, the finding that spin-offs and carve-outs do not significantly increase the relative valuation based on P/E, P/B and P/S, is confirmed.

5.6.4   Industrial Focus

Table 63 presents the median price multiples of focus increasing and non-focus increas-ing spin-offs and carve-outs. In line with the results of Woo, Willard, and Daellenbach (1992)[188], there seems to be no major influence of industrial focus on the evolution of spin-off firms' price multiples. Before and also following the transactions, the spin-off parents and subsidiaries resulting of industrial focus increasing and non-focus-increasing transactions show similar price-to-earnings and price-to-book multiples. Firms involved in non-industrial focus increasing spin-offs have higher price-to-sales ratios; the spin-off has no influence, as there is no different evolution depending on whether the event in-creases the industrial focus or not.

Parent and subsidiary firms of industrial focus increasing carve-outs exhibit substantially higher price-to-earnings and price-to-book multiples and lower price-to-sales multiples when compared to parent and subsidiary firms of non-industrial focus increasing carve-outs. However, there is, neither in carve-outs nor spin-offs, a significantly positive or negative influence of industrial focus on the evolution of price multiples from T-1 to T+1 or from T+1 to T+3. Hence the hypothesis "H5", that spin-offs and carve-outs that improve the industrial focus increase the relative valuation i.e., price multiples more than non-industrial focus improving transactions, has to be rejected.

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[188] Woo, Willard, and Daellenbach (1992) find based on a sample of 51 spin-offs between 1972 and 1986, that the proportion of not industrial focus increasing subsidiaries over the 3-year post-spin-off period that increased their price-to-book multiples was not significantly different from the corresponding proportion of focus increasing units. Hence related subsidiaries did not experience higher performance gains than not industrial focus increasing subsidiaries.

Table 63: Price Multiples: Industrial Focus

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+3				
Spin-offs										
P/E	**Difference**	**-0.2**	**-0.6**	**-1.3**	**0.4**	**-1.3**	**-0.4**	**0.6**	**-0.7**	**-1.7**
	Ind. Focus	13.4	12.8	14.0	12.4	12.9	-0.7	-1.0	1.2*	0.5
	Not Ind. Focus	13.6	13.4	15.3	12.0	14.1	-0.3	-1.6	1.9	2.1
P/B	**Difference**	**0.03**	**-0.12**	**-0.04**	**0.11**	**-0.13**	**-0.14**	**0.09**	**0.07**	**-0.25**
	Ind. Focus	1.65	1.85	1.85	1.79	1.58	0.20	0.14*	0.00	-0.21
	Not Ind. Focus	1.62	1.96	1.89	1.67	1.71	0.3**	0.05	-0.07	0.04
P/S	**Difference**	**-0.27****	**-0.20****	**-0.14**	**-0.12***	**0.01**	**0.07**	**0.16**	**0.07**	**0.13**
	Ind. Focus	0.91	0.88	0.79	0.95	1.05	-0.02	0.04*	-0.10	0.10
	Not Ind. Focus	1.18	1.09	0.92	1.06	1.03	-0.09	-0.12	-0.17	-0.03
Carve-outs										
P/E	**Difference**	**-2.3**	**4.7****	**-1.0**	**0.0**	**0.4****	**7.0**	**2.4**	**-5.7**	**0.4**
	Ind. Focus	13.6	14.0	12.0	14.0	13.4	0.4	0.4	-1.9	-0.6
	Not Ind. Focus	15.9	9.3	13.1	14.0	13.0	-6.7*	-2.0	3.8 (0.08)	-1.0
P/B	**Difference**	**-0.12**	**0.31****	**-0.21**	**0.51****	**0.05****	**0.43**	**0.63***	**-0.51**	**-0.46**
	Ind. Focus	1.91	1.81	1.64	2.38	2.03	-0.10	0.47***	-0.17	-0.35***
	Not Ind. Focus	2.03	1.50	1.85	1.87	1.98	-0.53	-0.16	0.35	0.12
P/S	**Difference**	**-0.54****	**-0.37****	**-0.33**	**-0.05**	**-0.34***	**0.17**	**0.49**	**0.04**	**-0.28**
	Ind. Focus	0.81	0.82	0.84	1.27	0.90	0.01	0.46***	0.02	-0.37***
	Not Ind. Focus	1.35	1.19	1.17	1.32	1.24	-0.16	-0.03	-0.02	-0.09***

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample partially smaller as not all data available; T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between industrial focus increasing transactions and not industrial focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

5.6.5 Geographical Focus

As outlined in the descriptive statistics an increase of geographical focus seems not to be rationale for spin-offs and carve-outs. Out of the 478 carve-outs and 423 spin-offs (with data available on price multiples as well as on geographical focus), only 76 (15.9%) carve-outs and 13 (3.1%) spin-offs improve the geographical focus. Hence, the results of spin-offs hardly can be taken into account. Firms involved in geographical focus-increasing spin-offs seem to have lower price multiples before as well as following the

transaction. However, geographical focus does not have any influence on the evolution of price multiples, neither from T-1 to T+1 nor from T+1 to T+3.

Table 64: Price Multiples: Geographical Focus

	Parent			Subsidiary		Difference in median			
						Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
	T-1	T+1	T+3	T+1	T+3				
Spin-offs									
P/E Difference	**-3.3**	**-1.9**	**-4.3**	**-2.6**	**-12.4****	**1.4**	**0.7**	**-2.4**	**-9.8**
Geo. Focus	10.4	11.1	10.1	9.8	1.2	0.7	-0.6	-1.0	-8.6
Not Geo. Focus	13.7	13.0	14.4	12.4	13.6	-0.7	-1.3	1.4	1.2
P/B Difference	**-0.65****	**-0.78***	**-0.06**	**-0.32**	**-0.53**	**-0.13**	**0.33**	**0.72**	**-0.21**
Geo. Focus	1.10	1.15	1.83	1.45	1.18	0.05	0.36	0.68	-0.28
Not Geo. Focus	1.75	1.93	1.89	1.78	1.71	0.18**	0.03	-0.04	-0.07
P/S Difference	**-0.13**	**-0.58***	**-0.10**	**-0.12**	**-0.18**	**-0.46**	**0.01**	**0.49**	**-0.07**
Geo. Focus	0.93	0.38	0.77	0.88	0.85	-0.55	-0.05	0.38	-0.03
Not Geo. Focus	1.06	0.97	0.86	1.00	1.03	-0.09	-0.06*	-0.10	0.03
Carve-outs									
P/E Difference	**3.9**	**5.3***	**-6.3**	**0.8**	**0.5**	**1.4**	**-3.1**	**-11.5**	**-0.3**
Geo. Focus	17.3	16.3	5.9	14.5	13.4	-1.0	-2.8	-10.4	-1.2
Not Geo. Focus	13.4	11.1	12.2	13.8	12.9	-2.4**	0.3	1.2	-0.9
P/B Difference	**-0.17**	**0.24**	**-0.44**	**0.20**	**0.19**	**0.41*****	**0.37**	**-0.68****	**-0.01**
Geo. Focus	1.81	1.86	1.35	2.37	2.03	0.05*	0.55	-0.51*	-0.34**
Not Geo. Focus	1.98	1.63	1.80	2.16	1.84	-0.35**	0.18**	0.17	-0.32***
P/S Difference	**0.21**	**0.31***	**-0.09**	**0.27**	**0.04**	**0.11****	**0.07**	**-0.40**	**-0.23****
Geo. Focus	1.13	1.23	0.85	1.58	0.98	0.10*	0.45	-0.38	-0.59***
Not Geo. Focus	0.93	0.92	0.94	1.30	0.94	-0.01	0.38***	0.02	-0.36***

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample partially smaller as not all data available; T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between geographical focus increasing transactions and not geographical focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

There is no significant influence of geographical focus on the level of prices multiples nor on the evolution of price-to-earnings multiples of carve-out firms. However, in price-to-book and price-to-sales ratios, it seems that parents involved in geographical focus-increasing transactions can increase the multiples from T-1 to T+1, while the ones of non-geographical focus-increasing transactions decline. However, this trends reverses from T+1 to T+3. Based on the evidence in this restricted sample, "H6", that

spin-offs and carve-outs that improve the geographical focus increase the relative valuation more than transactions not improving the geographical focus, is therefore rejected.

5.6.6   Incentive Alignment

Table 61 shows that spin-off parent and subsidiary firms can improve their price multiples similarly from T-1 to T+1 as well from T+1 to T+3. Parents can improve their P/E and P/B ratios (1.2 and 0.00) slightly more than their subsidiaries (0.00 and –0.08). Spin-offs subsidiaries, on the other hand, can increase their price-to-sales ratio from T+1 to T+3 (0.03) while the ones of their former parents' decline (-0.10). The results of Woo, Willard, and Daellenbach (1992), that found that the gains in the M/B ratio (which is equivalent to price-to-book ratio) of spin-off subsidiary firms in the three years following the spin-off were small in magnitude and not statistically significant, are hence confirmed. In carve-outs, parents' price multiples decline much less than those of their subsidiaries. Based on these, the Incentive Alignment Hypothesis "H7", that spin-offs and carve-outs improve the alignment of incentives in the subsidiary firm and hence that the subsidiary firms' relative valuation improves more than their parent firms, is rejected for both spin-offs as well as for carve-outs.

5.6.7   Independence of Subsidiary

The P/E, P/B and P/S evolution of parent and subsidiary companies involved in carve-outs, differentiated by the trajectory of the subsidiary firm, is depicted in Table 65. In the year following the carve-out, the subsidiaries have higher price multiples than their parents, regardless of the trajectory. There seems to be a similar evolution in price multiples of carve-out subsidiary firms, no matter whether they were acquired, merged, bought back by their parents or if their free float was more or less than 75% two years after the transaction.

Table 65: Price Multiples: Trajectory of Carve-out Subsidiary

		Parent			Subsidiary		Difference in median			
		T-1	T+1	T+3	T+1	T+2	Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+2 vs. Sub T+1
P/E	Acquired or bought back	12.2	11.5	13.8	14.6	15.3	-0.7	2.4	2.2	0.7
	Free float <75%	18.9	8.7	17.0	12.9	10.9	-10.2*	-6.0	8.3**	-2.0
	Free float >75%	15.1	11.6	10.2	13.1	14.5	-3.5	-2.0	-1.4	1.4
P/B	Acquired or bought back	1.59	1.33	1.78	2.13	2.15	-0.26	0.53	0.45	0.02
	Free float <75%	2.11	1.45	1.60	1.7	2.23	-0.66**	-0.40	0.15	0.53
	Free float >75%	1.76	1.68	1.79	2.11	1.89	-0.08	0.35***	0.11	-0.22*
P/S	Acquired or bought back	0.81	0.68	1.09	1.24	1.22	-0.13	0.44*	0.40	-0.02
	Free float <75%	1.16	0.89	0.76	1.27	1.09	-0.27	0.11	-0.13	-0.18**
	Free float >75%	1.07	0.94	0.91	1.31	1.19	-0.13	0.25*	-0.03	-0.12

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3/T+2.

Table 66 shows the price multiples of transactions where the subsidiaries are independent two years following the transaction (spin-offs and carve-outs with a free float bigger than 75%) and transactions with still dependent subsidiaries (other carve-outs). In terms of price-to-earnings and price-to-book, there are no major differences; only in the year T+1 parents with independent subsidiaries have significantly higher price-to-book ratios. Parents leading to independent subsidiaries also exhibit higher price-to-sales ratios in year T-1 and T+1, showing significantly lower price-to-sales ratios in T+3. Independent subsidiaries, in contrast, have lower P/S in the year following the transaction, but can catch up with the ones of dependent subsidiaries by T+2. In terms of price multiples evolution, there is only one significant difference between independent and dependent transactions: Parents with independent subsidiaries increase their P/Bs more from T-1 to T+1. These are slight indications that independence may improve the evolution of price multiples, weakly supporting the Independence of Subsidiary Hypothesis "H8".

Table 66: Price Multiples: Independence of Subsidiary

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+2 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+2				
P/E	**Difference**	**-0.2**	**2.4**	**-2.1**	**-0.9**	**0.6**	**2.6**	**-0.7**	**-4.5**	**1.5**
	Independent	13.6	12.8	13.2	12.5	13.3	-0.8	-1.1	0.4	0.8
	Dependent	13.8	10.4	15.3	13.3	12.7	-3.4	-0.5	4.9*	-0.6
P/B	**Difference**	**-0.15**	**0.44*****	**0.11**	**-0.21**	**-0.39**	**0.59***	**-0.06**	**-0.33**	**-0.18**
	Independent	1.70	1.87	1.85	1.82	1.79	0.16**	0.11**	-0.01	-0.03
	Dependent	1.85	1.42	1.74	2.02	2.18	-0.43	0.17	0.32	0.16
P/S	**Difference**	**0.10****	**0.18*****	**-0.12*****	**-0.21*****	**0.00**	**0.08**	**-0.31**	**-0.30**	**0.21**
	Independent	1.06	0.95	0.86	1.05	1.13	-0.11	-0.01**	-0.09	0.08
	Dependent	0.96	0.77	0.99	1.26	1.13	-0.19	0.30**	0.22	-0.13

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between independent and dependent transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3/T+2.

5.6.8 Timing

The Relative Valuation Timing Hypothesis "H11" is broadly supported by the results of this study. In the year following the transaction, carved-out subsidiaries exhibit high P/E, P/B and P/S ratios relative to their parents and also relative to the typical spin-off subsidiary or parent firm (Table 61 and Table 62). The evolution of price multiples of carve-out subsidiary firms subsequent to the transaction shows that the three price multiples drop considerably starting in the first year after the carve-out. These results provide strong support for "H11a", that price multiples of carved-out subsidiaries are on a high level in the year of the transaction but on a low level for spin-off subsidiary firms. "H11b" is also confirmed, as the median carve-out subsidiary has higher price multiples in T+1 than its parent firm has (P/E: 13.8 vs. 12.0; P/B: 2.2 vs. 1.8; P/S: 1.3 vs. 1.0). Spun-off subsidiaries, in contrast, are relatively low-valued as compared to their parents, also supporting "H11b". Spin-off subsidiaries have lower P/E and P/B ratios, but higher P/S ratios. The hypothesis is also supported by the fact that 68.4% of the carved-out subsidiaries have higher price-to-book multiples at the transaction than their parents. "H13b", that firms with cash needs due to high growth expectations choose to divest through carve-outs as opposed to spin-offs, is supported by the results of this study. In

the year following the transaction, carve-out subsidiaries exhibit high P/E, P/B and P/S ratios relative to the typical spin-off subsidiary or parent firm (Table 61). This indicates that the market expects higher future growth rates of carved-out subsidiaries, for which cash is often required.

5.6.9   Summary and Appraisal of Results

In summary, this paper finds based on a sample of 598 spin-offs and 650 carve-outs evidence that spin-off parents as well as subsidiaries can improve the price multiples significantly more than carve-out firms, supporting "H1". US spin-off and carve-out firms exhibit a better evolution of price multiples as compared to the evolution of price multiples of European firms involved in spin-offs and carve-outs. Based on this evidence, "H2" is rejected. The fact that price multiples of spin-offs only slightly improve, and the ones of carve-outs decline subsequent to the transaction, leads only to a weak support of "H4" for spin-offs and to the rejection of "H4" for carve-outs.

The Industrial Focus Hypothesis "H5" and the Incentive Alignment Hypothesis "H7" are rejected as well. The Geographical Focus Hypothesis "H6" is denied, as there is no significant differences between price multiples of cross boarder and domestic spin-offs and carve-outs. The independence of the subsidiary in contrast has a limited influence on the evolution of price multiples, providing weak support for "H8".

Price multiples of carved-out subsidiaries are higher directly after the transactions than those of their parents or of spin-off firms. This indicates that the market expects higher future growth rates for carved-out subsidiaries. However, the median price multiple of carve-out subsidiary firms peaks in the year following the transaction and then drops considerably. This means that carve-outs do not bring along strategic gains and that the high growth expectations of carved-out subsidiaries disappear in the years following the transaction. These results are convincing support for the Relative Valuation Timing Hypothesis "H11". The Financing Needs Hypothesis "H13b" is also validated, as firms with cash needs due to high growth expectations choose to divest through carve-outs, as opposed to spin-offs. The empirical evidence regarding the Outsiders' Information Asymmetry Reduction Hypothesis "H14" is much weaker; there is some support for spin-offs and a clear denial for carve-outs.

Figure 16: Price Multiples: Overview on Hypotheses Tested

Hypothesis tested empirically:				
▨ Strong support (not rejected)	S: Spin-offs			
▨ Medium support	C: Carve-outs			**Price Multiples Effects**
▢ Low/no support (rejected)				
	Hypothesis		**Operationalization**	
Type of transaction	H1	Spin-offs create more value than carve-outs	H1a	Spin-offs increase the relative valuation more than carve-outs	▨ (strong)
			H1b	European spin-offs increase the relative valuation more than European carve-outs	▨ (strong)
			H1c	US spin-offs increase the relative valuation more than US carve-outs	▨ (strong)
Place of transaction	H2	The value creation of spin-offs and carve-outs is similar in Europe and in the USA	H2a	European transactions increase the relative valuation similar to US transactions	▢ (low)
			H2b	European spin-offs increase the relative valuation similar to US spin-offs	▢ (low)
			H2c	European carve-outs increase the relative valuation similar to US carve-outs	▢ (low)
Pillar 1: **Strategic Business Portfolio Restructuring**	H4	Strategic Gains	H4	Thanks to strategic gains, spin-offs and carve-outs increase the relative valuation of parent and subsidiary firms following the transaction	[S] [C]
	H5	Industrial Focus	H5	Firms involved in spin-offs and carve-outs that improve the industrial focus increase the relative valuation more than firms involved in non-industrial focus increasing transactions	[S] [C]
	H6	Geographical Focus	H6	Firms involved in spin-offs and carve-outs that improve the geographical focus increase the relative valuation more than firms involved in non-geographical focus increasing transactions	[S] [C]
	H7	Incentive Alignment	H7	Subsidiary firms increase the relative valuation more than their parent firms	[S] [C]
	H8	Independence of Subsidiary	H8	Subsidiary firms resulting from spin-offs or from carve-outs with a high free float increase the relative valuation more than subsidiary firms depending on other firms	▨ (medium)
Pillar 2: **Timing & Financing Needs**	H11	Relative Valuation Timing	H11a	Price multiples of carved-out subsidiaries are at a high level in the year of the transaction, while they are on a low level for spin-off subsidiary firms	▨ (strong)
			H11b	Price multiples of carved-out subsidiaries are higher in the year of the transaction than the ones of their parents, while spin-off parents have higher multiples than their subsidiaries	▨ (strong)
	H13	Financing Needs	H13b	Firms with cash needs due to high growth expectations choose to divest through carve-outs as opposed to spin-offs	▨ (strong)
Pillar 3: **Outsiders' Information Asymmetry Reduction**			H14a	There is an increase in price multiples of parent and subsidiary firms involved in spin-offs and carve-outs	[S] [C]

These results provide evidence that spin-offs provide some strategic gains such as higher strategic flexibility and freedom. The relative valuation of carve-outs, in contrast, does not increase, and even decreases. Hence the often-heard argument of managers conducting carve-outs, that the motivation for the transaction is to unveil the value of a "pearl" hidden in a conglomerate, is falsified. The strong evidence validating the Relative Valuation Timing Hypothesis "H11" in contrast rather indicates that carve-out subsidiaries' relative valuation peaks around the transaction and managers are able and willing to exploit these relatively high valuations by selling stocks of the subsidiary in carve-outs.

5.7   Operating Performance Effects

In this section, the changes in the operating performance of firms following spin-offs and carve-outs are examined. More specifically, the three profitability, the two growth and one indebtedness measures introduced in Section 5.3.2 are investigated for the eleven years around the transactions.

5.7.1   Type of Transaction: Spin-offs vs. Carve-outs

5.7.1.1   Profitability

Differentiating the profitability of spin-off and carve-out firms shows that in the years before the transaction, spin-off firms are significantly more profitable than carve-out firms (Table 67, Table 68 and Table 82). The median spin-off (carve-out) firm has an earnings margin of 4.6% (3.6) in the year prior to the transaction, an EBIT margin of 7.8% (7.0%) and a ROA of 3.6% (2.3%). In the year of the transaction, however, carve-outs improve their profitability, catch up and even surpass spin-offs showing an ROA of 3.0%, as compared to the ROA of spin-offs of 2.7%.

Table 67: Profitability and Leverage: Spin-offs and Carve-outs

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+3				
Ear./ Rev.	**Spin-offs**	**4.62**	**4.00**	**3.78**	**3.21**	**3.88**	**-0.61*****	**-1.41*****	**-0.22**	**0.67**
	EU spin-offs	3.98	4.29	4.07	4.30	5.21	0.31	0.32	-0.22	0.91*
	US spin-offs	4.85	3.96	3.69	2.73	3.72	-0.89***	-2.12***	-0.27	0.99
	Carve-outs	**3.61**	**4.22**	**3.17**	**4.36**	**3.58**	**0.62**	**0.75**	**-1.05***	**-0.78*****
	EU carve-outs	3.70	4.15	2.60	4.05	2.36	0.45	0.36**	-1.55	-1.69***
	US carve-outs	3.24	4.26	3.61	4.64	3.90	1.02	1.40	-0.65	-0.75***
EBIT/ Rev.	**Spin-offs**	**7.80**	**7.94**	**7.63**	**6.29**	**6.89**	**0.13****	**-1.51*****	**-0.31**	**0.61**
	EU spin-offs	6.89	6.11	6.56	6.73	7.06	-0.77	-0.16	0.45	0.33
	US spin-offs	8.09	8.47	7.92	5.97	6.89	0.38	-2.11***	-0.55	0.92
	Carve-outs	**6.98**	**6.66**	**6.22**	**7.41**	**6.44**	**-0.32****	**0.43**	**-0.44**	**-0.97**
	EU carve-outs	6.25	6.02	4.43	6.09	6.44	-0.23**	-0.16	-1.59	0.35*
	US carve-outs	7.51	7.09	7.35	7.97	6.50	-0.42	0.45	0.26	-1.46
Ear./ Ass.	**Spin-offs**	**3.55**	**2.81**	**3.51**	**2.91**	**3.29**	**-0.74*****	**-0.63*****	**0.71**	**0.37**
	EU spin-offs	3.26	2.71	2.57	3.66	3.17	-0.55	0.40	-0.14	-0.49
	US spin-offs	3.61	2.81	3.61	2.75	3.36	-0.80***	-0.86***	0.80	0.61
	Carve-outs	**2.29**	**2.27**	**1.91**	**3.70**	**3.06**	**-0.02**	**1.41**	**-0.37****	**-0.65*****
	EU carve-outs	2.86	2.55	1.42	3.04	1.44	-0.31	0.18	-1.13**	-1.60***
	US carve-outs	2.09	2.21	2.04	4.33	3.21	0.13**	2.24	-0.17	-1.12***
Debt/ Ass.	**Spin-offs**	**27.1**	**30.1**	**30.3**	**25.1**	**28.3**	**3.0*****	**-2.0**	**0.2*****	**3.3**
	EU spin-offs	27.3	30.0	33.2	24.0	30.0	2.8	-3.3	3.1	6.0
	US spin-offs	25.6	30.1	29.3	25.6	27.7	4.5***	0.0	-0.8**	2.1
	Carve-outs	**29.8**	**28.4**	**26.6**	**22.0**	**28.0**	**-1.3**	**-7.8*****	**-1.9**	**6.0*****
	EU carve-outs	28.6	26.6	24.0	24.4	18.8	-2.1	-4.3	-2.6	-5.5
	US carve-outs	30.0	28.6	27.6	20.8	28.8	-1.3	-9.1***	-1.0	8.0***

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test.

Following the transaction, the median spin-off (carve-out) parent is more (less) profitable than its median subsidiary. The earnings margin of spin-off (carve-out) parents is with 4.0% (4.2%), higher (lower) than the 3.2% (4.4%) earnings margin of the median subsidiary. Thus the profitability measures indicate that in a spin-off, poorly performing subsidiaries are separated, while in carve-outs, more profitable subsidiaries are partially

sold in an IPO.[189] These results are in line with the findings of Powers (2001), which documents that carved-out subsidiaries are most profitable, fastest growing and active in the most attractive industries. Straight sold subsidiaries, on the contrary, show low profits, are slow growing and are operating in non-highly valued industries. Spin-off subsidiaries are in-between, meaning that managers, rather than selling to outsiders at distressed prices, prefer to distribute the subsidiary shares to their shareholders in a spin-off.

The profitability of spin-off parents and subsidiaries is harmed by the transaction in the short-run, but improves in the long run. The ROA of spin-off parents (subsidiaries) increases from 2.8% (2.9%) in the year T+1 to 3.7% (3.7%) four years later. Contrarily, carve-outs subsidiary firms' ROA reduces from 3.7% to 2.3% in the same time period, while the ROA of carve-out parents remains at 2.3%. This concurs with the results of Powers (2003). He also documents that carve-out subsidiaries' profit margin has a peaked pattern with the highest margin in the year of the transaction. The profitability improvements of spin-offs occur in both the parent and the subsidiary firms, while the lower profitability of carve-outs is mainly driven by the subsidiaries. The two columns on the right side of Table 68 show the difference in the evolution from T+1 to T+3 of the three profitability measures between spin-offs and carve-outs for parents as well as for subsidiaries: Spin-offs improve the profitability significantly more than carve-outs. This effect occurs for parents as well as for subsidiaries in the USA as well as in Europe. Hence, these results provide strong evidence to support "H1", that spin-offs improve the operating performance more than carve-outs.

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[189] Desai and Jain (1999) and Daley, Mehrotra, and Sivakumar (1997) also find evidence that firms spin-off underperforming subsidiaries, whereas carve-outs subsidiaries typically are more profitable and grow stronger than their parents (Powers, 2001 and 2003).

Table 68: Profitability and Leverage: Differences among Spin-offs and Carve-outs

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+3				
Ear./ Rev.	H1a Diff. spin and carve	**1.01**	**-0.22**	**0.61***	**-1.14***	**0.30**	**-1.23***	**-2.16***	**0.83**	**1.44***
	H1b Diff. EU spin and EU carve	0.28	0.14	1.47	0.25*	2.85***	-0.14	-0.04*	1.32	2.60
	H1c Diff. US spin and US carve	1.61**	-0.30	0.08	-1.91***	-0.17	-1.92***	-3.53***	0.38	1.74***
EBIT / Rev	H1a Diff. spin and carve	**0.82**	**1.28****	**1.41***	**-1.12**	**0.45**	**0.46**	**-1.95***	**0.14**	**1.58**
	H1b Diff. EU spin and EU carve	0.63	0.09	2.13*	0.64	0.62	-0.54	0.01	2.04	-0.02
	H1c Diff. US spin and US carve	0.58	1.38**	0.57	-1.99	0.39	0.80	-2.57	-0.80	2.39*
Ear./ Ass	H1a Diff. spin and carve	**1.25****	**0.53**	**1.61****	**-0.79****	**0.23**	**-0.72***	**-2.04***	**1.07**	**1.02***
	H1b Diff. EU spin and EU carve	0.40	0.17	1.15	0.62	1.73	-0.23	0.22	0.99*	1.11*
	H1c Diff. US spin and US carve	1.53***	0.60	1.57***	-1.57***	0.15	-0.93***	-3.10***	0.97	1.73***
Debt/ Ass	H1a Diff. spin and carve	**-2.68***	**1.68**	**3.74****	**3.10***	**0.32**	**4.36***	**5.78***	**2.06**	**-2.78***
	H1b Diff. EU spin and EU carve	-1.38	3.48	9.21**	-0.38	11.15	4.86	1.01	5.73	11.53
	H1c Diff. US spin and US carve	-4.40**	1.48	1.68	4.76	-1.11	5.88***	9.16**	0.20	-5.87**
Ear./ Rev.	H2b Diff. EU spin and US spin	-0.87	0.33*	0.38	1.57**	1.48*	1.20	2.44***	0.05	-0.09*
	H2c Diff. EU carve and US carve	0.46**	-0.11	-1.01	-0.59*	-1.54	-0.57*	-1.05**	-0.89	-0.95*
EBIT / Rev	H2b Diff. EU spin and US spin	-1.20	-2.35	-1.36	0.76	0.16	-1.15	1.96	1.00	-0.59*
	H2c Diff. EU carve and US carve	-1.26	-1.07	-2.92	-1.88	-0.06	0.19	-0.62	-1.85	1.81
Ear./ Ass	H2b Diff. EU spin and US spin	-0.35	-0.09	-1.04	0.91	-0.19	0.26	1.26*	-0.94	-1.10
	H2c Diff. EU carve and US carve	0.77**	0.34	-0.62	-1.29	-1.76	-0.44**	-2.06	-0.96*	-0.48
Debt/ Ass	H2b Diff. EU spin and US spin	1.70	-0.07	3.88	-1.61	2.30	-1.77*	-3.31	3.95	3.91
	H2c Diff. EU carve and US carve	-1.31	-2.07	-3.64	3.53	-9.96*	-0.76	4.84	-1.57	-13.49

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date, "Par" denotes parents, "Sub" subsidiaries, "Diff" differences, "spin" spin-offs, and "carve" carve-outs; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test.

5.7.1.2 Leverage

Carve-out firms exhibit higher leverage before the transaction than spin-off firms, providing evidence to support "H13". As depicted in Table 67, one year before the transaction, spin-off parents have a debt-to-assets ratio of 27.1%, while the median carve-out firm shows a ratio of 29.8%. Subsidiary firms of spin-offs, as well as of carve-outs, start their independent lifetime following the transaction with a healthy balance sheet, having relatively less debt than their parents. Thanks to the proceeds of the IPO, carve-out parents as well as subsidiaries can, in comparison to spin-off firms, reduce their indebtedness significantly. In year T+1, carve-out subsidiaries have the lowest debt-to-assets

ratios with 22.0% as compared to their parents with 28.4%, spin-off parents with 30.1% and spin-off subsidiaries with 25.1%. In the subsequent years, carve-out parent firms' and spin-off firms' indebtedness is constant, while that of carved-out subsidiaries increases substantially from 22.0% to 31.4% four years later.

5.7.1.3   Growth Rates

As depicted in Table 69, spin-offs show compound annual earnings growth rates of around 4.1% to 4.7% in the years prior to the transaction. However, their compound annual revenues growth rates drop from 8.1% to 0.7% in the last two years before the transaction. Carve-outs grow substantially more in earnings as well as in revenues than spin-offs in the years before the transaction. The differences in earnings and revenues CAGRs of 18.3% and 7.8% are based on the Mann-Whitney test, statistically significant on the 99% level (Table 70). Carve-outs can even increase their annual earnings growth rates from 8.3% to 22.4% in the two years prior to the transaction.

Table 69: CAGRs: Spin-offs and Carve-outs

		Before the transaction		Following the transaction				Difference in median	
		Parent				**Subsidiary**		**Parent**	**Subsidiary**
		From T-5 To T-2	**From T-2 To T**	**From T+1 To T+3**	**From T+3 To T+5**	**From T+1 To T+3**	**From T+3 To T+5**	**Par T-2 to T vs. Par T+1 to T+3**	**Par T-2 to T vs. Sub T+1 to T+3**
Earnings	**Spin-offs**	**4.71**	**4.08**	**4.66**	**8.72**	**12.75**	**16.19**	**0.58**	**8.67**
	EU spin-offs	1.68	3.76	-0.76	14.88	9.53	11.73	-4.52	5.76
	US spin-offs	6.05	5.68	7.92	8.26	13.61	16.19	2.24	7.93
	Carve-outs	**8.29**	**22.37**	**2.87**	**14.69**	**13.76**	**13.56**	**-19.50****	**-8.61*****
	EU carve-outs	8.22	26.37	-1.73	14.61	10.89	7.59	-28.10**	-15.48***
	US carve-outs	8.31	21.99	4.91	14.71	15.16	13.56	-17.08	-6.83**
Revenues	**Spin-offs**	**8.11**	**0.72**	**3.97**	**4.51**	**8.16**	**5.84**	**3.25*****	**7.45*****
	EU spin-offs	5.42	-4.44	-1.65	2.84	6.60	8.65	2.79***	11.04***
	US spin-offs	10.64	3.10	4.47	4.52	8.21	5.33	1.36	5.11***
	Carve-outs	**9.66**	**8.56**	**4.22**	**5.58**	**13.39**	**7.46**	**-4.34****	**4.83****
	EU carve-outs	5.70	9.24	-0.50	-0.02	5.25	-1.50	-9.74***	-3.99
	US carve-outs	11.53	8.37	5.98	6.39	14.62	8.97	-2.39	6.25***

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test.

Comparing the earnings growth rates in the two years before the transaction to the ones following the transaction shows that both spin-off parents and subsidiaries increase the growth rates, while both firms involved in carve-outs experience a significant drop.

These results confirm the findings of Powers (2003), who also find evidence for the peaked pattern of sales and earnings growth of carve-out subsidiary firms around the transaction date. Both spin-off firms also exhibit statistically significant higher revenues growth rates with 4.0% and 8.2%, in comparison to the pre-transaction measure of 0.7%. These results support "H3", that spin-offs improve the operating performance of parent and subsidiary firms following the transaction, but not for carve-outs. However, carve-outs subsidiaries with median revenue CAGR of 13.4% also grow more than the combined firm prior to the transaction (Table 70).

Table 70: CAGRs: Differences between Spin-offs and Carve-outs

| | Before the transaction | | Following the transaction | | | | Difference in median | |
| | Par | | | | Sub | | Par | Sub |
	From T-5 To T-2	From T-2 To T	From T+1 To T+3	From T+3 To T+5	From T+1 To T+3	From T+3 To T+5	Par T-2 to T vs. Par T+1 to T+3	Par T-2 to T vs. Sub T+1 to T+3
Earnings **H1a Diff. spin-offs and carve-outs**	**-3.59**	**-18.29***	**1.79**	**-5.96**	**-1.02**	**2.63**	**20.08***	**17.28***
H1b Diff. EU spin and EU carve	-6.53	-22.61***	0.97	0.27	-1.36	4.14	23.58**	21.24***
H1c Diff. US spin and US carve	-2.27	-16.31***	3.02	-6.45	-1.54	2.63	19.32	14.76
Revenues **H1a Diff. spin-offs and carve-outs**	**-1.55**	**-7.84***	**-0.25**	**-1.07**	**-5.23***	**-1.62**	**-1.55***	**-7.84**
H1b Diff. EU spin and EU carve	-0.27	-13.68***	-1.15	2.86**	1.34	10.15***	-0.27**	-13.68
H1c Diff. US spin and US carve	-0.89	-5.27***	-1.51	-1.87	-6.41***	-3.64	-0.89*	-5.27
Earnings H2b Diff. EU spin and US spin	-4.37	-1.92	-8.68	6.62	-4.09	-4.46	-6.76	-2.17
H2c Diff. EU carve and US carve	-0.10	4.38	-6.64	-0.10	-4.27	-5.97	-11.02***	-8.65**
Revenues H2b Diff. EU spin and US spin	-5.22***	-7.54***	-6.12**	-1.68	-1.61	3.32	1.43	5.93
H2c Diff. EU carve and US carve	-5.83***	0.87	-6.48**	-6.41***	-9.37***	-10.47**	-7.35***	-10.24***

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date, "Par" denotes parents, "Sub" subsidiaries, "Diff" differences, "spin" spin-offs, and "carve" carve-outs; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test.

Directly comparing the growth rates of spin-off and carve-out firms before and following the transaction shows that carve-out firms exhibit extraordinary revenues and earnings growth in the two years before the transaction. Carve-out firms almost succeed in maintaining these high revenues growth rates, though earnings growth rates substantially decrease resulting in average earnings growth rates similar to the ones of spin-off firms.

5.7.2   Place of Transaction: European vs. US Transactions

5.7.2.1   Profitability

As shown in Table 67 and Table 68, US spin-off firms are more profitable than Euro-pean spin-off firms before the transaction, although this is not statistically significant. In the year prior to the transaction, the median US (European) spin-off firms exhibit an earnings margin of 4.9% (4.0), an EBIT margin 8.1% (6.9%) and a ROA of 3.6% (3.3%). Carve-out firms in Europe and USA show a similar profitability. After the transaction, the profitability of the carved-out subsidiaries in both the USA and Europe decline. The median ROA of US (European) carved-out subsidiaries deteriorates from 4.3% (3.0%) in year T+1 to 3.2% (1.4%) in T+3. Only about one-third of carve-outs subsidiaries can increase their ROA in this time period. The profitability of US and European carve-out parent firms is smaller in year T+1 than in the year of the transac-tion, but remains stable on both continents at this reduced level.

Following the transaction the profitability of spin-off parent firms remains in both the USA and Europe on a similar level as before. However, US spin-off subsidiaries exhibit a stronger profitability decline from T-1 to T+1 than European subsidiaries, but compen-sate for this decline by a stronger increase in profitability from T+1 to T+3. More than half of the US spin-off subsidiaries increase all three profitability measures from year T+1 to T+3. The median US subsidiary increases the earnings margin, the EBIT margin and the ROA in this time period by 0.99%, 0.92% and 0.61%, whereas the median European spin-off subsidiary increases the respective measures by 0.91%, 0.33% and –0.49%. These results provide evidence to support "H1b", that European spin-offs im-prove the operating performance more than European carve-outs as well as "H1c", that US spin-offs improve the operating performance more than US carve-outs. "H2" is also supported, as there is no significant trend that European spin-off or carve-out firms im-prove their profitability more than US ones or vice versa.

5.7.2.2   Leverage

As show in Table 68, there is no pattern indicating that the indebtedness levels are sig-nificantly different for spin-off and carve-out firms in the USA and in Europe. In the year before the transaction, carve-out firms have more leverage in the USA (30.0% vs. 28.6%) and spin-off firms have more in Europe (27.3% vs. 25.6%). In the years follow-

ing the transaction, spin-off (carve-out) parents as well as subsidiaries exhibit similar levels of indebtedness in the USA and in Europe. However, the leverage evolution of carved-out subsidiaries is different from T+1 to T+3. Carved-out subsidiaries in Europe can decrease their debt-to-assets ratio by 5.5%, while their US counterparts increase the ratio by a significant 8.0%.

5.7.2.3   Growth Rates

Differentiating the revenues growth rates of European and US firms before spin-offs shows that US firms grow more than European firms (Table 68 and Table 69). The average cumulative revenue growth of US spin-off firms from T-2 to T is 3.1%, while European spin-off firms' revenues shrink, on average, by –4.4% annually. The US parents continue to grow stronger than European spin-off parent firms do after the transaction, whereas the subsidiaries grow in the same way. The revenues growth rates of US and European carve-out firms are similar before the transaction. While US carve-out firms maintain their growth rates on a similar level subsequent to the transaction, the growth rates of European parents and subsidiary carve-out firms drop and experience negative revenues CAGRs.

The earnings growth of European and US spin-off and carve-out firms is similar before the transaction. From T+1 to T+3 however, subsidiaries resulting from US spin-offs and carve-outs grow, with 13.6% and 15.2%, substantially more than their European counterparts, with 9.5% and 10.9%. In the five years following the transaction, the compound annual earnings growth rate is 10.2% and 7.8% for US parent firms, and significantly larger than for European parent firms with 7.1% and 2.8%.

5.7.3   Industrial Focus

5.7.3.1   Profitability

The differences in profitability and leverage between industrial focus improving and non-focus improving spin-offs and carve-outs are summarized in Table 71.

Table 71: Profitability and Leverage: Industrial Focus

		Parent			Subsidiary		Difference in median			
		T-1	T+1	T+3	T+1	T+3	Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
Spin-offs										
Ear./ Rev.	**Difference**	**-0.38**	**0.26**	**-0.19**	**0.76**	**1.69**	**0.64**	**1.14**	**-0.45***	**0.93**
	Ind. Focus	4.50	4.08	3.68	3.55	5.00	-0.42***	-0.95	-0.40	1.45
	Not Ind. Focus	4.88	3.82	3.87	2.79	3.31	-1.06**	-2.09**	0.04	0.52
EBIT/ Rev.	**Difference**	**-2.17****	**-2.52****	**-1.55****	**0.65**	**2.97**	**-0.35**	**2.83**	**0.97**	**2.32**
	Ind. Focus	7.08	6.80	6.96	6.55	8.13	-0.28	-0.54***	0.16	1.59
	Not Ind. Focus	9.26	9.33	8.51	5.89	5.16	0.07*	-3.37***	-0.82	-0.73
Ear./ Ass.	**Difference**	**0.22**	**0.36**	**0.48**	**1.24**	**1.34**	**0.14**	**1.02**	**0.12****	**0.10**
	Ind. Focus	3.56	2.90	3.54	3.58	3.67	-0.67**	0.02**	0.64	0.09
	Not Ind. Focus	3.35	2.54	3.06	2.35	2.33	-0.81**	-1.00**	0.52	-0.01
Debt/ Ass.	**Difference**	**1.3**	**-2.9**	**-1.5**	**2.4**	**3.3**	**-4.2**	**1.1**	**1.4****	**0.9****
	Ind. Focus	27.1	28.8	29.4	26.2	28.4	1.6*	-0.9	0.7***	2.2***
	Not Ind. Focus	25.8	31.7	31.0	23.9	25.1	5.9***	-2.0	-0.7	1.2
Carve-outs										
Ear./ Rev.	**Difference**	**-0.43**	**-0.02**	**-1.48**	**-0.93**	**-1.26**	**0.41**	**-0.50****	**-1.46***	**-0.33**
	Ind. Focus	3.52	4.25	2.72	4.22	3.37	0.74**	0.71**	-1.54**	-0.86*
	Not Ind. Focus	3.95	4.27	4.19	5.15	4.62	0.33	1.20	-0.08	-0.53***
EBIT/ Rev.	**Difference**	**-3.59**	**2.64***	**-1.39**	**-0.89**	**-1.15**	**6.23****	**2.70****	**-4.03***	**-0.27***
	Ind. Focus	6.54	7.32	6.07	7.44	6.44	0.78	0.90	-1.26*	-1.01*
	Not Ind. Focus	10.13	4.68	7.46	8.33	7.59	-5.45**	-1.80	2.78	-0.74
Ear./ Ass.	**Difference**	**0.32**	**0.60**	**-0.26**	**1.15**	**0.58**	**0.28**	**0.82**	**-0.87**	**-0.56**
	Ind. Focus	2.37	2.48	1.87	4.48	3.39	0.11*	2.12	-0.61**	-1.09***
	Not Ind. Focus	2.04	1.88	2.14	3.34	2.80	-0.17	1.29	0.26	-0.53***
Debt/ Ass.	**Difference**	**0.2**	**-0.2**	**5.7**	**2.7**	**-0.5**	**-0.3**	**2.5**	**5.9**	**-3.2**
	Ind. Focus	29.9	28.3	29.8	23.7	27.8	-1.6	-6.2**	1.5	4.1***
	Not Ind. Focus	29.8	28.5	24.1	21.0	28.3	-1.3	-8.7*	-4.4	7.2***

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between industrial focus increasing transactions and not industrial focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

There is no clear pattern in the difference between industrial focus increasing and non-increasing spin-off firms' profitability before the transaction. Following the transaction, subsidiaries resulting from industrial focus-increasing spin-offs are more profitable than non-focus increasing subsidiaries in all three measures investigated, though not statistically significant. The median earnings margin of focus-increasing (non-focus increas-

ing) spin-off subsidiaries in year T+1 is 3.6% (2.8%) and in year T+3 5.0% (3.3%), showing that industrial focus-increasing subsidiaries are more profitable directly following the transaction and can even increase the difference in subsequent years.

Firms involved in non-industrial focus-improving carve-outs are more profitable than firms in focus improving transactions, although not statistically significant. The impact of industrial focus on the profitability of carve-out firms before as well as following the event is unclear. For example, the median focus-increasing parent has a higher ROA (2.3% vs. 2.0%) before the transaction, but a lower earnings margin (3.5% vs. 4.0%). This pattern remains, as following the transaction, the median ROA is higher for focus-increasing parents (2.5% vs. 1.9%) and subsidiaries (4.5% vs. 3.3%). In contrast, they have a similar (4.3% vs. 4.3%) or lower (4.2% vs. 5.2%) median earnings margin. Industrial focus has a limited influence on the level and the evolution of profitability measures of spin-off firms, but none on profitability measures of carve-outs firms. Hence this provides some support for "H5" for spin-offs but rejects it for carve-outs.

5.7.3.2   Leverage

Industrial focus has no major effect on the indebtedness of either spin-off or carve-out firms before and/or following the event. The single influence is that subsidiaries resulting from focus increasing spin-offs seem to have, with a debt-to-assets ratio of 26.2% in T+1 and 28.4% in T+3, a higher indebtedness than their non-focus increasing counterparts with 23.9% and 25.1%.

5.7.3.3   Growth Rates

Firms as outcome from industrial focus increasing transactions show significantly lower revenues growth in the years before the transaction than their non-industrial focus increasing counterparts (Table 72). This gap in revenue growth remains for carve-out parents as well as subsidiaries following the event, whereas parent and subsidiary firms resulting from focus-increasing spin-offs can catch up in revenues growth rates. The two columns on the right side of Table 72 document though that the evolution growth rates of spin-offs firms are not significantly influenced by industrial focus.

Table 72: CAGRs: Industrial Focus

		Before the transaction		Following the transaction				Difference in median	
		Parent				Subsidiary		Parent	Subsidiary
		From T-5 To T-2	From T-2 To T	From T+1 To T+3	From T+3 To T+5	From T+1 To T+3	From T+3 To T+5	Par T-2 to T vs. Par T+1 to T+3	Par T-2 to T vs. Sub T+1 to T+3
Spin-offs									
Earn-ings	**Difference**	**-0.13**	**7.56**	**-4.66**	**-3.67**	**-2.97**	**-11.21**	**-12.22**	**-10.53**
	Ind. Focus	4.58	8.30	3.87	8.26	12.22	8.39	-4.43	3.92
	Not Ind. Focus	4.71	0.74	8.53	11.93	15.19	19.60	7.79	14.45
Reve-nues	**Difference**	**-3.13***	**-3.07***	**-1.55**	**1.39**	**0.11**	**-1.09**	**1.52***	**3.18**
	Ind. Focus	7.18	-0.38	2.91	5.38	7.82	6.05	3.29**	8.19***
	Not Ind. Focus	10.31	2.69	4.47	4.00	7.70	7.14	1.77	5.01
Carve-outs									
Earn-ings	**Difference**	**-4.79****	**1.05**	**-10.68***	**0.50**	**-3.19**	**-10.51**	**-11.72**	**-4.23**
	Ind. Focus	5.74	22.87	-1.24	15.24	13.53	10.97	-24.12	-9.34
	Not Ind. Focus	10.53	21.83	9.44	14.74	16.72	21.48	-12.39	-5.10
Reve-nues	**Difference**	**-6.18****	**-6.61****	**-5.62****	**-4.92***	**2.62**	**-7.90***	**0.99**	**9.23**
	Ind. Focus	7.69	4.89	2.83	4.72	14.20	6.03	-2.06	9.31***
	Not Ind. Focus	13.87	11.49	8.45	9.64	11.58	13.93	-3.04	0.08**

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between industrial focus increasing transactions and not industrial focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

The earnings growth rates of industrial focus and non-industrial focus increasing transactions do no differ significantly before and following the event. However, the evolution of revenues growth rates of spin-offs are partially influenced by industrial focus. The growth rates of carve-out firms, in contrast, are not substantially influenced by industrial focus.

5.7.4 Geographical Focus

5.7.4.1 Profitability

The result of the announcement, long-term stock market and price multiples effects analysis, that an increase of geographical focus is no major rationale for spin-offs and carve-outs, are confirmed in the operating performance analysis.

Table 73: Profitability and Leverage: Geographical Focus

| | | Parent | | | Subsidiary | | Difference in median | | | |
		T-1	T+1	T+3	T+1	T+3	Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+3 vs. Sub T+1
Spin-offs										
Ear./ Rev.	Difference	**0.26**	**-2.58**	**-1.56**	**1.17**	**-1.70**	**-2.84**	**0.91**	**1.02**	**-2.87**
	Geo. Focus	4.88	1.51	2.31	4.37	2.18	-3.38	-0.51	0.80	-2.19
	Not Geo. Focus	4.62	4.08	3.87	3.20	3.88	-0.54***	-1.42***	-0.22	0.68
EBIT/ Rev.	Difference	**-0.02**	**0.77**	**4.59**	**-3.52**	**2.85**	**0.79**	**-3.50**	**3.82***	**6.38**
	Geo. Focus	7.83	8.71	12.17	2.83	9.74	0.88	-5.01*	3.46*	6.91
	Not Geo. Focus	7.86	7.94	7.58	6.35	6.89	0.08**	-1.50***	-0.36	0.54
Ear./ Ass.	Difference	**0.55**	**-1.47**	**-1.04**	**1.38**	**-2.96**	**-2.01**	**0.83**	**0.42**	**-4.34**
	Geo. Focus	4.11	1.38	2.47	4.28	0.36	-2.73	0.17	1.09	-3.91
	Not Geo. Focus	3.56	2.85	3.51	2.90	3.33	-0.72***	-0.67***	0.67	0.43
Debt/ Ass.	Difference	**11.6****	**9.1**	**6.7**	**5.7**	**-11.5**	**-2.5**	**-5.9***	**-2.3**	**-17.2**
	Geo. Focus	38.2	38.6	36.8	30.5	16.9	0.4	-7.7**	-1.8	-13.6
	Not Geo. Focus	26.6	29.5	30.0	24.8	28.4	2.9***	-1.8	0.5***	3.6
Carve-outs										
Ear./ Rev.	Difference	**0.98**	**0.80**	**-2.58**	**-0.12**	**-0.71**	**-0.18**	**-1.10**	**-3.38**	**-0.59**
	Geo. Focus	4.61	5.00	1.03	4.23	2.96	0.38	-0.38	-3.97	-1.27***
	Not Geo. Focus	3.63	4.19	3.61	4.36	3.67	0.56	0.72	-0.58	-0.69***
EBIT/ Rev.	Difference	**1.65**	**-1.01**	**-2.26**	**2.10**	**-0.06**	**-2.66**	**0.45**	**-1.25**	**-2.16**
	Geo. Focus	8.43	6.18	4.93	9.40	6.38	-2.25	0.97	-1.25	-3.02
	Not Geo. Focus	6.78	7.19	7.19	7.30	6.44	0.41**	0.52	0.00	-0.87
Ear./ Ass.	Difference	**-0.21**	**-0.30**	**-1.38**	**-2.19**	**-1.89**	**-0.09**	**-1.97**	**-1.08**	**0.30**
	Geo. Focus	2.11	2.06	0.77	1.98	1.48	-0.05	-0.12	-1.29	-0.50***
	Not Geo. Focus	2.32	2.36	2.14	4.17	3.37	0.04	1.85	-0.22*	-0.80***
Debt/ Ass.	Difference	**0.7**	**-2.6**	**0.2**	**3.4**	**0.5**	**-3.2**	**2.7**	**2.8**	**-2.8**
	Geo. Focus	30.4	26.1	26.8	24.3	28.5	-4.4	-6.1	0.8	4.1***
	Not Geo. Focus	29.8	28.6	26.6	21.0	27.9	-1.1	-8.8***	-2.0	7.0***

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between geographical focus increasing transactions and not geographical focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

There is no significant influence of geographical focus on the profitability evolution in all three profitability measures of carve-out firms. For spin-offs, there is only one significantly different evolution: parent firms involved in cross boarder spin-offs improve the EBIT-margin significantly more from T+1 to T+3 than parent firms in domestic spin-offs. However, there are only very few cross boarder spin-offs investigated.

5.7.4.2   Leverage

Firms involved in cross boarder spin-offs exhibit substantially more leverage before the event than firms involved in domestic spin-offs. Subsequent to the transaction, these differences are no longer significant. This documents that geographical focus-increasing spin-off firms reduce their indebtedness more than non-geographical focus-increasing spin-off firms. On the level and the evolution of the indebtedness of carve-outs, in contrast, geographical focus has no significant influence.

5.7.4.3   Growth Rates

Table 74 shows that the revenues of firms involved in geographical focus-improving carve-outs grow more before and less subsequent to the event, as compared to firms involved in domestic carve-outs.

Table 74: CAGRs: Geographical Focus

| | | Before the transaction | | Following the transaction | | | | Difference in median | |
| | | Parent | | | | Subsidiary | | Parent | Subsidiary |
		From T-5 To T-2	From T-2 To T	From T+1 To T+3	From T+3 To T+5	From T+1 To T+3	From T+3 To T+5	Par T-2 to T vs. Par T+1 to T+3	Par T-2 to T vs. Sub T+1 to T+3
Spin-offs									
Earn-ings	**Difference**	**-62.09***	**1.44**	**25.85**	**-26.26**	**-20.64**	**-45.92**	**24.41**	**-22.08**
	Geo. Focus	-56.19	6.04	30.62	-17.06	-7.49	-29.70	24.58	-13.53
	Not Geo. Focus	5.90	4.59	4.76	9.20	13.14	16.22	0.17	8.55
Reve-nues	**Difference**	**-2.74**	**-6.84**	**-5.00**	**27.48**	**-10.66**	**-0.94**	**1.84**	**-3.82**
	Geo. Focus	5.42	-4.77	-0.89	31.99	-2.49	4.90	3.88	2.29
	Not Geo. Focus	8.17	2.07	4.11	4.51	8.17	5.84	2.04	6.10***
Carve-outs									
Earn-ings	**Difference**	**3.27**	**1.52**	**8.74**	**-0.05**	**1.03**	**-18.25**	**7.21**	**-0.49**
	Geo. Focus	10.18	23.73	9.36	14.66	14.80	-3.77	-14.37	-8.93
	Not Geo. Focus	6.90	22.21	0.62	14.71	13.76	14.48	-21.58***	-8.44
Reve-nues	**Difference**	**-1.21**	**3.06****	**-2.45**	**-1.36**	**-6.41***	**-5.47***	**-5.51**	**-9.46**
	Geo. Focus	8.74	10.99	2.47	4.52	7.73	3.20	-8.52*	-3.27
	Not Geo. Focus	9.95	7.94	4.92	5.88	14.13	8.67	-3.02**	6.19***

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date, "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between geographical focus increasing transactions and not geographical focus increasing transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3.

However, analyzing the change in the median revenues and earnings growth rates of domestic and cross border spin-offs and carve-outs shows that geographical focus has no significant influence.

The results on profitability, leverage and growth rates provide evidence to reject the Geographical Focus Hypothesis "H6", that spin-offs and carve-outs that improve the geographical focus improve the operating performance more than transactions not improving the geographical focus.

5.7.5   Incentive Alignment

Section 5.7.5 tests the Incentive Alignment Hypothesis "H7", that spin-offs and carve-outs improve the alignment of incentives in the subsidiary firm and hence, that the subsidiary firms operating performance improves more than the one of parent firms.

5.7.5.1   Profitability

Making the distinction between parents and subsidiaries shows that in spin-offs, relatively low-profit subsidiaries are spun-off, while in carve-outs, highly profitable subsidiaries are carved-out. However, the effects are not the same in the USA as in Europe. European spin-offs subsidiaries are more profitable in T+1 than their parents, while US spin-offs subsidiaries are less profitable than their former parent firms are. This effect is robust, as it is found in all three-profitability measures investigated. The difference in profitability between parents and subsidiaries remains constant for European transactions, while it gets closer for US spin-offs.

This means that US spin-offs subsidiaries improve their profitability more than their parents do. Carve-out subsidiaries are more profitable in T+1 than their parents in Europe as well as in the USA. In year T+3, the profitability of carve-out parents and subsidiaries is comparable, meaning that the profitability of subsidiaries suffers more from T+1 to T+3 than the one of their parents. Hence for spin-offs, there is evidence to support "H7", but it is rejected for carve-outs.

5.7.5.2   Leverage

Subsidiary firms of spin-offs as well as of carve-outs are, in T+1, less indebted than their parents in T-1 and T+1. However, while the indebtedness of spin-off parents remains stable from T+1 to T+3 and the one of carve-out parents' decline, the indebtedness of subsidiaries increases. Spin-offs subsidiaries' debt-to-assets ratio rises from 25.1% to 28.3% from T+1 to T+3, and the one of carve-out subsidiaries become even stronger from 22.0% to 28.0%.

5.7.5.3   Growth Rates

Table 69 documents that both spin-off as well as carve-out subsidiaries grow substantially more in earnings and revenues following the transaction than their parents do. Spin-off (carve-outs) subsidiary earnings' CAGR from T+1 to T+3 are 12.8% (13.8%), while the one of parents is only 4.7% (2.9%). As the growth rates in the year before the transaction are not publicly available, one cannot judge whether subsidiaries' earnings and revenues already grew more before or if this growth is due to the transaction. The higher price multiples of carve-out subsidiaries, as compared to carve-out parents, indicate that subsidiaries grew already more than their parents before the event. Spin-offs subsidiaries, in contrast, exhibit lower price multiples than their parents in year T+1. This signifies that spin-off subsidiaries' earnings and revenue growth was not as strong before the transaction as afterwards. Hence, the higher growth rates of spun-off subsidiaries subsequent to the event are a benefit of the transaction.

5.7.6   Independence of Subsidiary

The profitability and leverage of parent and subsidiary companies involved in carve-outs differentiated by the trajectory of the subsidiary firm is depicted in Table 75.

5.7.6.1   Profitability

There seems to be a similar evolution in profitability of carved-out subsidiary firms, regardless of whether they were acquired or merged or whether their free float is more or less than 75% two years after the transaction. No matter the trajectory of the subsidiary, carve-out parents have a lower profitability in T+1, as compared to T-1 and the carved-out subsidiaries are more profitable in T+1, as compared to the parents' profitability in

T-1. From T+1 to T+3, parents tend to improve their profitability, while the subsidiaries' profitability declines from T+1 to T+2.

Table 75: Profitability and Leverage: Trajectory of Carve-out Subsidiary

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+2 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+2				
Ear./ Rev.	Acquired or merged	4.59	4.19	4.86	5.39	6.15	-0.39	0.80	0.66	0.76
	Free float <75%	3.69	2.83	3.59	4.21	3.50	-0.86	0.51	0.76	-0.71
	Free float >75%	5.40	5.35	2.37	5.69	4.96	-0.05	0.29	-2.98	-0.73
EBIT/ Rev.	Acquired or merged	7.65	8.98	9.79	10.15	9.98	1.33	2.50	0.81	-0.17
	Free float <75%	10.05	5.85	6.27	7.57	4.93	-4.20**	-2.47	0.42	-2.64
	Free float >75%	8.78	8.26	5.83	9.43	7.98	-0.52	0.64	-2.43	-1.45
Ear./ Ass.	Acquired or merged	1.70	2.04	1.70	2.07	2.53	0.34	0.37	-0.34	0.46
	Free float <75%	2.61	1.53	2.27	2.90	1.50	-1.08	0.29	0.74	-1.4
	Free float >75%	3.35	3.18	1.61	5.17	4.51	-0.16	1.83	-1.57**	-0.66
Debt/ Ass.	Acquired or merged	28.6	25.5	30.0	25.5	34.4	-3.1*	-3.1	4.5**	8.9
	Free float <75%	32.4	34.7	27.9	23.4	21.1	2.2	-9.1	-6.7	-2.3
	Free float >75%	27.1	21.7	23.1	18.7	24.8	-5.4	-8.4	1.4	6.1

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; T denotes the execution date; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test.

Analyzing the level and the evolution of the operating performance of independent and dependent transactions confirms these results, as there are only minor differences (Table 76). The median firm involved in transactions (leading to independent subsidiaries two years subsequent to the event) has only a significantly higher ROA before and also following the event. There are no significant differences in the profitability evolution neither from T-1 to T+1 nor from T+1 to T+2/T+3.

Table 76: Profitability and Leverage: Independence of Subsidiary

		Parent			Subsidiary		Difference in median			
							Par T+1 vs. Par T-1	Sub T+1 vs. Par T-1	Par T+3 vs. Par T+1	Sub T+2 vs. Sub T+1
		T-1	T+1	T+3	T+1	T+3				
Ear./ Rev.	**Difference**	**0.33**	**0.72**	**-0.54**	**-0.69**	**-0.86**	**0.40**	**-1.01**	**-1.26**	**-0.17**
	Independent	4.63	4.09	3.69	3.64	3.96	-0.54***	-0.98**	-0.40	0.32
	Dependent	4.30	3.37	4.23	4.33	4.82	-0.93	0.03	0.86	0.49
EBIT/ Rev.	**Difference**	**-0.54**	**0.10**	**-2.18**	**-1.90**	**-1.15**	**0.64**	**-1.36**	**-2.29**	**0.75**
	Independent	8.05	8.03	7.53	6.69	7.02	-0.03**	-1.37***	-0.50	0.33
	Dependent	8.59	7.92	9.71	8.58	8.17	-0.67	-0.01	1.79	-0.41
Ear./ Ass.	**Difference**	**1.50***	**0.85**	**1.00**	**0.95**	**1.14**	**-0.65**	**-0.54**	**0.15**	**0.19**
	Independent	3.52	2.83	3.14	3.5	3.44	-0.69**	-0.02***	0.31	-0.06
	Dependent	2.02	1.98	2.14	2.55	2.30	-0.04	0.53	0.16	-0.25*
Debt/ Ass.	**Difference**	**-2.8**	**0.4**	**-0.7**	**-0.3**	**-2.4**	**3.3***	**2.5**	**-1.2**	**-2.1**
	Independent	27.1	29.2	29.3	23.9	26.0	2.1***	-3.2	0.1***	2.1
	Dependent	29.9	28.8	30.0	24.2	28.4	-1.2	-5.7	1.2	4.2

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; T denotes the execution date; "Par" denotes parents and "Sub" subsidiaries; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between independent and dependent transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3/T+2.

5.7.6.2   Leverage

Thanks to the proceeds of the transaction, carve-out firms can reduce their indebtedness in the year following the event as compared to the year before. Firms with a free float less than 75% two years subsequent to the transactions show a distinctive leverage pattern. They have, by far, the highest debt-to-assets ratio (32.5%) in T-1. However, in contrast to the other two carve-out categories, their indebtedness reduces from T+1 to T+2/T+3.

5.7.6.3   Growth Rates

The earnings and revenue growth rates of parent and subsidiary companies involved in carve-outs differentiated by the trajectory of the subsidiary firm are depicted in Table 77. Carve-out firms that merge or are later acquired show the higher earnings and revenues growth rates from T-5 to T-2. From T-2 to T, the growth rates do not differ de-

pending on the subsequent trajectory.   Parent and subsidiary firms involved in carve-outs resulting in independent subsidiaries with more than 75% free float show in the years subsequent to the transaction, a tendency for lower earnings and revenues growth than the other parent and subsidiary carve-out firms.

Table 77: CAGRs: Trajectory of Carve-out Subsidiary

		Before the transaction		Following the transaction			Difference in Median	
		Parents				Subsidiary	Parent	Subsidiary
		From T-5 To T-2	From T-2 To T	From T+1 To T+3	From T+3 To T+5	From T+1 To T+2	Par T-2 to T vs. Par T+1 to T+3	Par T-2 to T vs. Sub T+1 to T+2
Earnings	Acquired or merged	10.22	22.03	0.62	20.39	13.65	-21.40	-8.37
	Free float <75%	5.74	20.23	7.48	17.21	16.74	-12.75**	-3.49
	Free float >75%	4.74	21.83	-1.75	29.23	12.53	-23.57	-9.30
Revenues	Acquired or merged	19.51	6.41	5.37	4.87	13.16	-1.04	6.75**
	Free float <75%	3.56	4.68	4.46	5.88	11.52	-0.22	6.84
	Free float >75%	5.65	8.72	1.00	0.55	6.83	-7.71	-1.89**

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample of 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date; "Par" denotes parents and "Sub" subsidiaries; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3/T+2.

Table 78: CAGRs: Independence of Subsidiary

		Before the transaction		Following the transaction			Difference in Median	
		Parents				Subsidiary	Parent	Subsidiary
		From T-5 To T-2	From T-2 To T	From T+1 To T+3	From T+3 To T+5	From T+1 To T+2	Par T-2 to T vs. Par T+1 to T+3	Par T-2 to T vs. Sub T+1 to T+2
Earnings	Difference	-4.73	-14.06***	1.27	-3.84	-4.40	15.33	9.66
	Independent	4.71	7.89	4.14	10.87	12.75	-3.75*	4.86
	Dependent	9.44	21.95	2.87	14.71	17.15	-19.08**	-4.80
Revenues	Difference	-4.23**	-2.62**	-1.51	-0.69	-4.58**	1.12	-1.96
	Independent	7.77	2.26	3.86	4.48	7.92	1.60	5.65***
	Dependent	12.00	4.89	5.37	5.17	12.50	0.48	7.61***

Median cumulative average growth rates (CAGRs) of earnings and revenues in %; based on a sample o of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003; T denotes the execution date; "Par" denotes parents and "Sub" subsidiaries; sample substantially smaller as data on carve-outs status 2 years after the transaction not available; asterisks indicate significance at the 10% (*), 5% (**) and 1% (***) level using the two sample Mann-Whitney test for the difference between dependent and independent transactions; and using the Wilcoxon Signed Rank test to asses the significance of changes from T-1 to T+1 and from T+1 to T+3/T+2.

Comparing independent and dependent firms shows that earnings growth increases substantially more for independent firms than for dependent firms subsequent to the transac-

tion. Hence these results provide some support for the Independence of Subsidiary Hypothesis "H8".

5.7.7   Timing

5.7.7.1   Profitability

There is strong empirical evidence for the Operating Performance Timing Hypothesis "H12": "H12a" is supported, as the profitability of spin-off parents and subsidiaries improves in the long run subsequent to the transaction. The earnings margin of spin-off parents (subsidiaries) increases from 4.0% (3.2%) in year T+1 to 4.6% (3.8%) two years later in T+3. Contrarily, carve-outs subsidiary firms' earnings margins reduce from 4.4% to 3.2% in the same time period, while the earnings margin of carve-out parents is stable (from 4.2% to 4.4%). Following the transaction, the median spin-off parent is more profitable, while the median carve-out parent is less profitable than their median subsidiary, supporting "H12b". The EBIT margin of spin-off parents is, with 8.0%, higher than the 6.3% EBIT margin of the median subsidiary. Thus, the profitability measures indicate that in a spin-off, poorly performing subsidiaries (as compared to the parents) are separated. In carve-outs, in contrast, more profitable subsidiaries (with an EBIT margin of 7.4% as compared to the one of their parents of 6.7%) are partially sold via an IPO.

5.7.7.2   Leverage

The empirical evidence supports "H13a", which states that those firms with cash needs due to a high leverage choose to divest through carve-outs as opposed to spin-offs. Carve-out firms are, with a debt-to-assets ratio of 29.8%, more indebted in T-1 than spin-off firms with a median debt-to-assets ratio of 27.1%.

5.7.7.3   Growth Rates

Hypothesis "H12a", that the operating performance of carved-out subsidiaries peaks in the year of the transaction while it is on a low level for spin-off subsidiary firms, is supported; Revenues and earnings of carve-outs grow less after the transaction than before, while spin-offs parent firms can increase or at least maintain their growth rates. Table

69 shows that carve-outs grow substantially and significantly more in earnings as well as in revenues than spin-offs in the years before the transaction. Comparing the earnings growth rates in the two years before the transaction to the ones following the transaction, however, documents that spin-off firms increase the growth rates while growth rates of carve-outs firms fall significantly.

5.7.8   Summary and Appraisal of Results

Using a sample of 690 carve-outs and 598 spin-offs during the time period 1990 to 2003, this paper documents superior (inferior) post-issue operating performance of firms conducting spin-offs (carve-outs). The profitability of spin-off parents and subsidiaries improves in the long run, while on the contrary, carve-outs subsidiary firms' profitability reduces. Carve-out firms grow more in earnings as well as in revenues than spin-offs in the years before the transaction, but they are unable to maintain these growth rates. Spin-off parents as well as subsidiaries, in contrast, increase their growth rates following the event. Hence "H1", that spin-offs improve the operating performance more than carve-outs and "H2", that the value creation of spin-offs and carve-outs is similar in Europe and in the USA, are supported. The Operating Performance Gains Hypothesis "H3", that transactions improve the operating performance of parent and subsidiary firms following the event, is supported for spin-offs and rejected for carve-outs.

The superior spin-off performance is positively influenced by industrial focus-increasing transactions, providing support for "H5", although the effect is not very strong. The operating performance of firms involved in events is not influenced by whether they are domestic or cross boarder, thus rejecting "H6". Spin-off subsidiaries' operating performance improves more than the one of their parents, while for carve-outs, the operating performance evolution of parents and subsidiaries is similar. This supports "H7" for spin-offs and rejects it for carve-outs. Earnings growth increases substantially more for independent firms than for dependent firms subsequent to the transaction, providing some support for the Independence of Subsidiary Hypothesis "H8".

Figure 17: Operating Performance: Overview on Hypotheses Tested

	Hypothesis	Operationalization	Operating Performance Effects
Hypothesis tested empirically: ■ Strong support (not rejected) ▨ Medium support □ Low/no support (rejected)		S: Spin-offs C: Carve-outs	
Type of transaction	**H1** Spin-offs create more value than Carve-outs	H1a Spin-offs improve the operating performance more than carve-outs H1b European spin-offs improve the operating performance more than European carve-outs H1c US spin-offs improve the operating performance more than US carve-outs	▨
Place of transaction	**H2** The value creation of spin-offs and carve-outs is similar in Europe and in the USA	H2a European transactions improve the operating performance similar to US transactions H2b European spin-offs improve the operating performance similar to US spin-offs H2c European carve-outs improve the operating performance similar to US carve-outs	▨
Pillar 1: **Strategic Business Portfolio Restruc-turing**	**H3** Operating Performance Gains **H5** Industrial Focus	H3 Spin-offs and carve-outs improve the operating performance of parent and subsidiary firms following the transaction H5 Firms involved in spin-offs and carve-outs that improve the industrial focus improve the operating performance more than firms involved in non-industrial focus increasing transactions	S C S C
	H6 Geographical Focus	H6 Firms involved in spin-offs and carve-outs that improve the geographical focus improve the operating performance more than firms involved in non-geographical focus increasing transactions	S C
	H7 Incentive Alignment **H8** Independence of Subsidiary	H7 Subsidiary firms improve the operating performance more than their parent firms H8 Subsidiary firms resulting from spin-offs or from carve-outs with a high free float improve the operating performance more than subsidiary firms depending on other firms	S C ▨
Pillar 2: **Timing & Financing Needs**	**H12** Operating Performance Timing **H13** Financing Needs	H12a Operating performance of carved-out subsidiaries is at a high level in the year of the transaction, but at a low level for spin-off subsidiary firms H12b Operating performance of carved-out subsidiaries is better than that one of their parents in the transaction year, while spin-off parents have a better operating performance than their subsidiaries H13a Firms with cash needs due to a high leverage choose to divest through carve-outs as opposed to spin-offs	▨
Pillar 3: **Outsiders' Information Asymmetry Reduction**		H14a There is no change in the operating performance of parent and subsidiary firms involved in spin-offs and carve-outs	S C

In line with former empirical evidence, this paper also documents that in spin-offs, less growing and less profitable subsidiaries are separated that are able to improve their operating performance subsequent to the event. In carve-outs, on the other hand, the more profitable and highly growing subsidiaries are sold when their operating performance is at a peak. These results strongly support the Operating Performance Timing Hypothesis "H12". Both the hypothesis "H12a" (that the operating performance of subsidiaries in the year of the transaction peaks for carve-out firms, and are on a low level for spin-off firms), as well as the hypothesis "H12b" (that the operating performance of carve-out subsidiaries is higher than the one of their parents, while spin-off parents have a better operating performance than their subsidiaries), are supported. The Financing Needs Hypothesis "H13" is also verified, as carve-out firms exhibit higher leverage before the transaction than spin-off firms do. Due to the proceeds of the IPO, carve-out firms can, as compared to spin-off firms, reduce their indebtedness significantly. In year T+1, carve-out subsidiaries have the lowest debt-to-assets ratios. In the subsequent years however, carve-out parent firms' and spin-off firms' indebtedness is constant, while those of carved-out subsidiaries substantially increases. The Outsiders' Information Asymmetry Reduction Hypothesis "H14a" is rejected (supported) for spin-offs (carve-outs), as there is a (no) substantial change in the operating performance of parent and subsidiary.

In summary, these results provide evidence that spin-offs increase the operational efficiency, enabling post-transaction improvements in the operating performance. The benefits of spin-offs, based on Strategic Business Portfolio Restructuring, outweigh the drawbacks; spin-offs release parents as well as subsidiaries from diseconomies of scale by combining disparate assets such as incompatible systems or corporate cultures. Additionally, the costs of decision-making and control and especially the complexity are reduced and management and staff can focus on their core business. The fact that spin-off subsidiaries are around the transaction on a level in their operating performance, facilitate the improvement subsequent to the transaction. Carve-out firms' operating performance, in contrast, is on a high level around the transaction and carve-out firms are not able to subsequently increase their operating performance.

6 Conclusion

Chapter 6 concludes with the insights of this research regarding the value creation of spin-offs and carve-outs. It summarizes the results following the structure of the hypotheses in Section 6.1, outlines consequences for managers deciding about spin-offs and carve-outs in Section 6.2, and gives an outlook in Section 6.3.

6.1 Summary of Results

The empirical study provides striking evidence to support the two overall hypotheses that spin-offs create more value than carve-outs ("H1") and that the value creation of spin-offs and carve-outs is similar in Europe and in the USA ("H2").

Figure 18: Value Creation of Spin-offs and Carve-outs

Legend: ■ Positive ■ Neutral □ Negative

Transaction types	Announcement	Long-term Stock Market		Price Multiples		Operating Performance	
		Parents	Subsidiaries	Parents	Subsidiaries	Parents	Subsidiaries
All spin-offs	Positive	Positive	Positive	Neutral	Neutral	Neutral	Positive
EU spin-offs	Positive	Positive	Positive	Neutral	Neutral	Neutral	Positive
US spin-offs	Positive	Positive	Positive	Positive	Neutral	Neutral	Positive
All carve-outs	Positive	Negative	Negative	Neutral	Neutral	Negative	Negative
EU carve-outs	Positive	Negative	Neutral	Negative	Negative	Negative	Negative
US carve-outs	Positive	Negative	Negative	Neutral	Neutral	Negative	Neutral

As shown in Figure 18, spin-off firms in Europe as well as in the USA exhibit a positive announcement effect and positive abnormal long-term stock market returns. They benefit from an increased relative valuation, and are able to improve their operating performance. Carve-out firms, on the contrary, show negative long-term abnormal stock market

returns and their operating performance is worse subsequent to the transaction than be-
fore the transaction.

The announcement effect of about 1.0% to 3.0% is similar for firms announcing spin-
offs and carve-outs. This concurs with previous studies and shows that the stock market,
during the period from 1990 to 2003 was on average, in favor of focusing transactions,
no matter whether there was a funding element (as in the case of carve-outs) or not. In
light of the disadvantages of carve-outs (such as potential conflicts of interests with the
parent company, limited strategic flexibility, unattractive acquisition currency, and lim-
ited access to suppliers), it is nevertheless surprising. The empirical study measures the
long-term stock market effects and unveil substantial differences between spin-offs and
carve-outs. While the average spin-off firm outperforms the market, the average carve-
out firm considerably underperforms the market. Spin-off parents (subsidiaries) show
robustly positive ABHARs of 7.7% (18.9%), 17.3% (30.9%), 15.9% (55.8%) and 23.5%
(74.2%) for the overlapping one-, two-, three- and four-year periods. Carve-out parents
(subsidiaries), in contrast, exhibit robustly negative ABHARs of -8.8% (8.2%), -11.8%
(-7.9%), -34.3% (-17.2%) and –40.4% (-14.7%) for the respective periods. Therefore
despite the similar announcement effect, there is striking evidence to support the overall
hypothesis "H1", that spin-offs create more value on the stock market than carve-outs.
These results can be interpreted as evidence of investor underreaction to the benefits of
spin-offs and as overreaction to those of carve-outs at the announcement; in the long run,
however, the fundamental differences lead to an inferior performance of carve-out firms
as compared to spin-off firms.

Most empirical work done to-date on spin-offs and carve-outs is based on US data;
European evidence is scarce. This paper is the first study testing the stock market and
the operating and relative valuation effects of spin-offs and carve-outs on a broad scale
for both US and European transactions. The empirical evidence shows that the effects of
spin-offs and carve-outs in Europe and USA do not differ substantially. Hence the hy-
pothesis "H2", that the value creation of spin-offs and carve-outs occurring in the USA
and Europe is similar, is validated. The announcement, the long-term stock market and
the operating performance effects are similar for US and European transactions. US
spin-off and carve-out firms show a better evolution of price multiples than European
firms subsequent to the transaction. The level of shareholder protection and origin of
law has no influence on the effects.

Figure 19: Overview on Hypotheses Tested

Hypothesis tested empirically:
- ▰ Strong support (not rejected) S: Spin-offs
- ▱ Medium support C: Carve-outs
- ☐ Low/no support (rejected)

Category	Hypothesis		Announcement	Long-term Stock Market	Price Multiples	Operating Performance
Type of transaction	H1	Spin-offs create more value than carve-outs	☐	▰	▰	▰
Place of transaction	H2	The value creation of spin-offs and carve-outs is similar in Europe and in the USA	S C	S C	S C	S C
Pillar 1: **Strategic Business Portfolio Restructuring**	H3	Operating Performance Gains				S C
	H4	Strategic Gains			S C	
	H5	Industrial Focus	S C	S C	S C	S C
	H6	Geographical Focus	S C	S C	S C	S C
	H7	Incentive Alignment		S C	S C	S C
	H8	Independence of Subsidiary	☐	▰	▱	▱
	H9	Relative Size of Transaction	S C	S C		
Pillar 2: **Timing & Financing Needs**	H10	Stock Market Timing		▰		
	H11	Relative Valuation Timing			▰	
	H12	Operating Performance Timing				▰
	H13	Financing Needs			▰	▰
Pillar 3: **Outsiders' Inform. Asym. Reduction**	H14	Outsiders' Information Asymmetry Reduction			S C	S C

Strategic Business Portfolio Restructuring (Pillar 1) and Timing & Financing Needs (Pillar 2) are the two pillars of rationales explaining the different value creation of spin-offs and carve-outs. Outsiders' Information Asymmetry Reduction (Pillar 3), in contrast, has no substantial influence on the value creation of spin-offs and carve-outs. Within Pillar 1, Operating Performance Gains "H3", Strategic Gains "H4" and the benefits of Independence of Subsidiary "H8" are the three explanations enlightening the value creation differences.[190] First, spin-off parents as well as subsidiaries benefit from strategic gains and hence can improve the relative valuation significantly more than carve-out firms. The second explanation for the better stock market performance of spin-off firms, as compared to carve-out firms, is the superior post-issue operating per-

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[190] The other hypotheses within Pillar 1 (Industrial Focus "H5", Geographical Focus "H6", Incentive Alignment "H7" and Relative Size of Transaction "H9") are neither key driver for the value creation itself nor do they account for the differences between spin-offs and carve-outs.

formance of spin-off firms. The profitability of spin-off parents and subsidiaries improves in the long run, while the profitability of carve-outs subsidiary firms' declines. Spin-off parents and subsidiaries are also able to increase the earnings and revenues growth rates, while the growth rates of firms involved in carve-outs decline. The benefits of independence of the subsidiary are the third explanation for the better performance of spin-off firms. Following a spin-off, the parent company completely loses its influence on the subsidiary, whereas parent companies following carve-out transactions, in most cases, retain a controlling interest in the subsidiaries. Carve-out subsidiaries that are still dependent on the parent or another firm show a significant long-term underperformance. Carve-out subsidiaries with a free float larger than 75% (which are comparably independent as spin-off subsidiaries), in contrast, substantially outperform their benchmarks subsequent to the event.

The empirical study shows that Timing & Financing Needs (Pillar 2) and the associated hypotheses "H10"-"H13" are important elements in explaining the superiority of spin-offs as compared to carve-outs. While spin-offs do not generate cash proceeds, carve-outs do and are hence also a mean of funding. Thus managers planning to carry out a carve-out have an incentive to conduct the transaction when such financing is cheap, exploiting a window of opportunity. Market returns of carve-out companies before the transaction are substantially higher than returns after the transaction, supporting "H10". There is no such difference between pre- and post-returns of spin-off firms. The median price multiple of carve-out subsidiary firms peaks in the year following the transaction and subsequently drops considerably, giving evidence for "H11". Carve-outs do not facilitate strategic gains and the high growth expectations of these carved-out subsidiaries disappear in the years following the transactions. Carve-out firms also grow more in earnings as well as in revenues than spin-offs in the years before the transaction, although they are not able to maintain these growth rates. Spin-off parents, as well as subsidiaries, in contrast, increase their growth rates following the event, supporting "H12". The Financing Needs hypothesis "H13" is also verified, as carve-out firms have cash needs due to their higher leverage and to their high growth expectations. This paper finds evidence that in spin-offs, less growing and less profitable, relatively lower-priced subsidiaries are separated, improving their operating performance and valuation subsequent to the event. In carve-outs, on the other hand, more profitable, highly growing and highly valued subsidiaries are partially sold to the public when the market is "hot" for them.

6.2   Consequences for Managers' Decisions on Spin-offs and Carve-outs

The results of the empirical study indicate that the average manager follows a "pecking order of corporate restructuring", when they intend to get rid of a business line. First they try to sell the business to a single investor in a trade sale, who can exploit synergy benefits with its existing businesses. If there is no such investor ready and able to pay a takeover premium, managers often try to carve-out the business. In that way they can sell part of their subsidiary to dispersed investors, who are willing to pay the in the parent firm managers' view "fair price". If there is an urgent cash need, managers may even be willing to sell their subsidiary for a lower price. Otherwise, a spin-off is the last option. This is a preferable option if there is no cash need and there are significant benefits from independence. However based on the results in this study and the fundamentals differences between spin-offs and carve-outs this pecking order approach is not always in the best interest of existing and entering shareholders.

In my view the deciding factor in applying spin-offs and carve-outs is rather whether the parent company is in need of cash or not. If there is no funding need, management should focus on how to create additional value. Therefore, managers regularly have to benchmark their firm's relative valuation and stock market and operating performance. If there are signs of underperformance, the management needs to decide how to tackle it. The default option is to address the value creation shortfall within the current organizational and management structure. However, if it is a deep-seated problem, ownership restructuring should be taken into consideration. Ownership restructuring includes either selling a business to a strategic buyer or a financial investor, creating a joint venture with a partner or spinning-off the business to the shareholders. Based on the results in this paper, carve-outs are NOT a valid option in such a situation; spin-offs are clearly preferable. Spin-offs are an eminently promising option, (1) if outsiders do not recognize the fair value of the business and hence there is no external buyer willing or able to pay an adequate price, (2) if there are no substantial synergies with the remaining businesses, and (3) if the subsidiary lacks strategic freedom in the current ownership set-up. If the parent firm requires immediate cash, the financial dimension may overrule strategic and operational considerations. Therefore, the chosen alternatives are designed to raise cash and do not necessarily maximize shareholder value in the short-term. If there is a cash need, the first option is usually to raise funds internally through working capital reductions such as trade credits, trade debts, factoring and better cash and stock man-

agement. If this is not sufficient, external sources, such as issuing debt or equity or ownership restructuring (such as selling or carving-out businesses) have to be considered. The management must decide which of these options is most favorable based on the company's situation and the financial market conditions. One of the main issues regarding carve-outs is finding the optimal solution for the trade-off between cash and control. Managers should bear in mind that carve-outs are not a final state, as if once the process towards separation is launched; it is difficult to freeze or even to reverse it.

6.3   Outlook

It will be interesting to see whether spin-off firms continue in the future to create abnormal value and whether carve-out firms continue to destroy value. The results of the empirical study show that the average announcement effect for carve-outs became smaller since 1999, while the one for spin-offs increased in the last three years of the sample. Furthermore, since 1998, carve-outs did not experience significantly negative two-year ABHARs. These indications raise questions for the future: Are stock market participants becoming more and more aware of the higher share of "lemons" in carve-outs (as compared to spin-offs)? Are potential carve-out subsidiaries' stock buyers becoming afraid of the winners' curse and as a result, do parent companies need to offer a lower price for carve-out firms' stocks in order to prevent a market failure? The persistency of the spin-off firms' positive abnormal long run returns is also questionable, as from 1990 to 2003, the performance was partially driven by extreme positive outliers. The median long-run abnormal returns of spin-off and carve-out firms in the period investigated was significantly negative. It is hence a pivotal question as to whether these positive outliers will occur consistently in the future. For investors and conglomerates' managers though it is demanding to base their decisions (whether to invest or conduct a transaction), on such a skewed and fat-tailed distribution of long-term abnormal returns.

In addition to the extensive sample and the rather broad time period investigated, other strong arguments support the persistency of the results: Individuals often disregard Bayes' rule and rational choice theories when making decisions, and place more weight on recent experience at the expense of long-term averages. Hence, investors may systematically be overly optimistic about the prospects of carve-out firms that had a positive performance in the recent years before the transaction and too pessimistic about spin-off firms that have performed poorly. In the long run, these initially optimistic

(pessimistic) investors become disappointed (positively surprised) and returns decline (increase). In line with this, DeBondt and Thaler (1985, 1987), demonstrate that buying former losers and selling winners is a profitable long-term investment strategy. Lakonishok, Shleifer, and Vishny (1994) show that value strategies based on low price multiples also exhibit abnormally high returns and that value stocks outperform glamour stocks. Miller (1977) and Morris (1996) have another argument for the too high prices of IPOs such as carve-outs; they state that with costly short selling and heterogeneous beliefs among investors, the most optimistic investors will determine the carve-out stock price for the IPO. Over time, more information becomes available about the firm and hence the divergence of beliefs will diminish and the marginal holder will no longer be quite so optimistic. Additionally, as the free float of carved-out subsidiaries increases over time, the marginal holder will also have more realistic expectations.

Another major argument in favor of the persistence of the positive (negative) effects for spin-off (carve-out) firms is, that the better long run performance of spin-off firms (as compared to carve-out firms) is backed-up by the improved operating performance of spin-off firms. This finding comprises a message to managers: The best way to create value, as measured by the market capitalization on the stock market, is to improve the business itself, as over time, the company's operating performance and its stock market performance behave in parallel. Spin-off firms are in a much better position to achieve this goal, as carve-out firms suffer from many strategic and operational drawbacks. Jung, Kim, and Stulz (1996) show that cash in-flows associated with carve-outs may also intensify agency problems and result in lower operating performance. If these increased agency problems are not fully anticipated by the market, they will be manifested in low post-transaction stock returns. Spin-off firms, in contrast, can start on fertile soil: parents can focus on their core business and subsidiaries benefit from the increased independence. Additionally, it is less difficult to improve the operational performance from a low level as in spin-offs than it is to further advance it from an already high level as in carve-outs.

Investors should carefully analyze the characteristics of subsidiaries that become separated from their parent company and subsequently listed at a stock exchange. They should also question the motivation of managers' decision to conduct such a transaction: Is it done for value purposes and to improve the business itself (as in many spin-offs)? Or is it motivated by cash needs taking into long-term damaging conflicts-of-interest (as in many carve-outs)? With the latter, carve-out subsidiary stocks' investors could demand a discount in the offering price as compensation for the immediate cash delivery.

Conglomerates' managers should further assess their business portfolios and thoroughly answer the question: "Who is the best owner for each of my businesses?" Like smart apple farmers, managers should follow a proactive program of restructuring, keeping in mind that spin-offs are pure ownership restructurings, whereas carve-outs are mainly means of financing that induce many governance issues and do not harvest the full benefits of focus and independence.

Abbreviations

AAR	Average abnormal return
ABHAR	Average buy and hold abnormal return
ABHR	Average buy and hold return
ACAR	Average cumulative abnormal return
APB	Accounting Principles Board
AR	Abnormal return
Av	Average
BHAR	Buy and hold abnormal return
BHR	Buy and hold return
CAAR	Cumulative average abnormal return
CAGR	Cumulative average growth rate
CAR	Cumulative abnormal return
Carve	Carve-out(s)
Debt/Ass.	Financial debt divided by total assets; debt-to-assets ratio
e.g.	For example
Ear./Ass.	Earnings divided by total assets
Ear./Rev.	Earnings divided by revenues; earnings margin
EBIT	Earnings before interests and taxes
EBIT/Rev.	Earnings before interests and taxes divided by revenues; EBIT margin
EMH	Efficient market hypothesis
ESOP	Employee stock ownership plan
EU	European
Geo. Focus	Geographical focus increasing
German GAAP	German Generally Accepted Accounting Principles
GV	Global Vantage
HML	High minus low book to market: Returns of high book-to-market companies minus the returns of low book-to-market companies
i.e.	That is to say
IAS	International Accounting Standards
IFRS	International Financial Reporting Standards (formerly IAS)
Ind. focus	Industrial focus increasing
IPO	Initial public offering
JV	Joint venture
LBO	Leveraged buy-out
M	Million(s)

M&A	Merger and acquisition
MBHAR	Median buy and hold abnormal return
MBO	Management buy-out
MCAR	Median cumulative abnormal return
Me	Median
MLP	Master limited partnership
NPV	Net present value
NZZ	Neue Zürcher Zeitung
OLS	Ordinary least squares
Par	Parent(s)
R&D	Research and development
ROA	Return on assets
ROIC	Return on invested capital
SBU	Strategic Business Unit
SDC	Securities Data Corporation
SEC	Securities and Exchange Commission
SEO	Seasoned equity offering
SIC	Standard Industry Classification
SMB	Small minus big: Returns of small companies minus the returns of big companies
Spin	Spin-off(s)
Sub	Subsidiary(-ies)
Swiss GAAP ARR	Swiss Generally Accepted Accounting Principles/Accounting and Reporting Recommendations
SWX	SWX Swiss Stock Exchange
t	Announcement date
T	Execution date
TFSD	Thomson Financial Securities Data
TRS	Total return to shareholders
TRX	Transaction
US GAAP	United States Generally Accepted Accounting Principles
USD	US Dollar

Used Laws and Regulations

Abbreviation	Name in Local Language	Translated Name
European Union		
	EU Admission Directive: Directive 79/279/EEC	
	EU Interim Reports Directive: Directive 82/121/EEC	
	EU Prospectus Directive: Directive 80/390/EEC	
	EU Regulation 1606/2002: Recommendation for Additional Guidance Regarding the Transition to IFRS	
Germany		
AktG	Aktiengesetz	German Stock Corporation Act
BörsG	Börsengesetz und Wertpapierhandelsgesetz	Exchange Act
BörZulV	Verordnung über die Zulassung von Wertpapieren zur amtlichen Notierung an einer Wertpapierbörse	Stock Exchange Admission Regulation
DCGK	Deutscher Corporate Governance Kodex	German Corporate Governance Code
EstG	Einkommensteuergesetz	German Income Tax Act
HGB	Handelsgesetzbuch	German Commercial Code
KonTraG	Gesetz zur Kontrolle und Transparenz im Unternehmensbereich	Law on Control and Transparency in Corporate Matters
KStG	Körperschaftssteuergesetz	German Corporate Taxation Act
MitBestG	Gesetz über die Mitbestimmung der Arbeitnehmer (Mitbestimmungsgesetz)	German Co-Determination Act
UmwG	Umwandlungsgesetz	German Corporate Reorganization Act
UmwStG	Umwandlungssteuergesetz	Corporate Reorganization Tax Act
VerkProspVO	Verkaufsprospekt-Verordnung	Prospectus Ordinance (Ordinance on the Prospectus for Securities Offered for Sale)
Switzerland		
	SWX Richtlinie betreffend Ausnahmen von der "3-Jahresregel"	SWX Directive on Exemptions from the "Three-Year Rule"
BEFusG (2000)	Botschaft zum Entwurf für ein Bundesgesetz über Fusion, Spaltung, Umwandlung und Vermögensübertragung, 2000	Commentary to the Swiss Merger Act
CO	Obligationenrecht (Bundesgesetz betreffend die Ergänzung des Schweizerischen Zivilgesetzbuches: Fünfter Teil: Obligationenrecht)	Swiss Code of Obligations
DBG	Bundesgesetz über die direkte Bundessteuer	Federal Law on Direct Taxation
FusG	Fusionsgesetz (Bundesgesetz über Fusion, Spaltung, Umwandlung und Vermögensübertragung)	Swiss Merger Act
LR	Kotierungsreglement der SWX	Listing Rules of the SWX

MWStG	Bundesgesetz über die Mehrwertsteuer	Federal law on Value Added Tax
SESTA	Bundesgesetz über die Börsen und den Effektenhandel (Börsengesetz)	Federal Act on Stock Exchanges and Securities Trading
StG	Bundesgesetz über die Stempelabgaben	Federal Law on Stamp Duty
StHG	Bundesgesetz über die Harmonisierung der direkten Steuern der Kantone und Gemeinden	Federal Law on the Harmonization of Direct Taxes of the Cantons and Communes
Swiss Code	Swiss Code of Best Practice für Corporate Governance	Swiss Code of Best Practice for Corporate Governance
VstG	Bundesgesetz über die Verrechnungssteuer	Federal Law on Withholding Tax

United Kingdom

	British Taxation of Chargeable Gains Act 1992	

USA

	Blue Ribbon Report	
IRS	Internal Revenue Service	
IRC	Internal Revenue Code	
	Sarbanes-Oxley Act	
	SEC Staff Legal Bulletin No. 4 (CF)	
	Securities Act of 1933	
	Securities Exchange Act of 1934	

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Appendix

Statistical Tests for Significance

Conventional T-test

The conventional single sample t-test is used to compare the mean of a sample to a known number, often zero. For example, it is used to test the null hypothesis that the ACAR of carve-outs in a specific event window is zero. This test is based on the assumption that the subjects are randomly drawn from a population and the distribution of the mean being tested is normal.

The t-statistic of the conventional t-test is defined as:

$$t = \sqrt{n}\,\frac{ACAR_t}{\sigma(CAR_t)}$$

The test statistic has n-1 degrees of freedom, where n is the number of observations. If the p-value associated with the t-test is small, there is evidence to reject the null hypothesis in favor of the alternative. Applied to the example above, a small p-value means that carve-outs create ACARs different from zero.

Skewness-adjusted T-test

According to Barber and Lyon (1997), long-horizon BHARs are positively skewed, leading to negatively biased t-statistics. Hence as short-term abnormal returns i.e., BHARs may be positively skewed as well. The skewness-adjusted t-test, as suggested by Johnson (1978), is used to the null hypothesis that the average buy and hold abnormal return (ABHAR) is equal to zero for the sample of n firms. The skewness-adjusted t-statistic t_{sa} is defined as:

$$t_{sa} = \sqrt{n}(S + \frac{1}{3}\hat{y}S^2 + \frac{1}{6n}\hat{y})$$

with

$$S = \frac{ABHAR_t}{\sigma(BHAR_t)} \qquad \text{and} \qquad \hat{y} = \frac{\sum_{i=1}^{n}(BHAR_{it} - ABHAR_t)^3}{n\sigma(BHAR_t)^3}$$

Whereby $\hat{y}$ is the estimate of the coefficient of skewness and $\sqrt{n}S$ is the conventional t-statistic.

Two sample T-test

To assess whether the means of two groups are statistically different from each other, the t-test for two samples, testing the null hypothesis that the difference between two groups is zero, is used. This test is appropriate in comparing the means of two groups e.g., comparing the CARs of focus improving and non-focus improving transactions. This t-test uses the means ($ACAR_1$ and $ACAR_2$) of the two groups (the numbers of values (n_1 and n_2) used to calculate the means and the standard deviation (σ_1 and σ_2) of each set of values). Under the null hypothesis of no difference between the CARs, the t-statistic is calculated for unequal sample sizes as follows:

$$t = \frac{ACAR_1 - ACAR_2}{\sqrt{\frac{(n_1-1)\sigma_1^2 + (n_2-1)\sigma_2^2}{n_1+n_2-2}\left(\frac{n_1+n_2}{n_1-n_2}\right)}}$$

In this t-test, the degrees of freedom are the sum of the number of values in the two groups minus 2.

Wilcoxon Signed Rank Test

The nonparametric Wilcoxon Signed Rank test is designed to test the null hypothesis, which states that the scores are distributed symmetrically around a specified center C. As the Wilcoxon Signed Rank test does not require an assumption of a specific distribution, it is frequently used in place of the one sample t-test when the normality assumption is questionable. The Wilcoxon Signed Rank test is performed by first ranking the

scores by the absolute values of their deviations from C, whereby discarding scores that exactly equal C and assigning mean ranks to tied scores. The smallest deviation is ranked 1 and N denotes the remaining number of scores. The sum of the ranks is then computed for either the values above C or the values below C and defines S as the smaller of the two rank-sums.[191] If the null hypothesis is true, the rank-sum of the positive differences should be roughly the same as the sum of the ranks of the negative differences. The smaller rank-sum S has normal distribution with mean $\frac{N(N+1)}{4}$ and variance $\frac{N(N+1)(2N+1)}{24}$. If N is bigger than 30, the test value z can be calculated as follows:

$$z = \frac{S - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}}$$

Mann-Whitney Test

The Mann-Whitney Test is a test used for comparing two populations and is a non-parametric alternative to the two-sample t-test. It is used to test the null hypothesis that two populations have identical distribution functions against the alternative hypothesis that the two distribution functions differ only with respect to location (median), if at all. It is performed by combining the two data sets, sorting them into ascending order, and assigning each point a rank: The smallest value is given rank 1, the largest observation is ranked n_1+n_2. Should some of the observations be identical, the average rank is assigned to all these values. After arranging the data, the ranks for each data set is added up in rank-sums, the smaller rank-sum is denoted R. n_1 (n_2) is the number of observations of the population with the lower (higher) rank sum. R has normal distribution with mean $\frac{n_1(n_1+n_2+1)}{2}$ and variance $\frac{n_1 n_2(n_1+n_2+1)}{12}$.

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[191] Either can be used; the sum of all *N* ranks must equal *N*(*N*+1)/2, so either sum can easily be computed from the other.

In case n_1 and n_2 are bigger than 10, the test value "z" can be calculated as follows:

$$z = \frac{R - \dfrac{n_1(n_1 + n_2 + 1)}{2}}{\sqrt{\dfrac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

Table 79: Data Sources

Bloomberg	Bloomberg is the interactive, financial information network. Market sector coverage: government, equity, corporate, mortgage, money market, municipal, preferred equity, commodities, indices, currencies and derivatives. Equity coverage: 246,000 securities in 129 countries and 153,000 companies from 250 exchanges.
Dow Jones	Dow Jones Publications Library contains more than 6,000 publications and more than 80 million articles. It includes newspapers, magazines, trade journals, transcripts and newswires and is the exclusive archive of the Wall Street Journal and other Dow Jones publications. Includes the Wall Street Journal from 01/02/84 to present.
Factiva	Factiva is an online business information service succeeding to Dow Jones Interactive and Reuters Business Briefing. Nearly 8,000 publications are available, including more than 1,000 global and local newspapers, more than 6,500 magazines, including industry-specific journals and newsletters, more than 270 newswires, including Dow Jones, Reuters and The Associated Press. Factiva covers publicly and privately held companies, industries, the stock market and the economy. Coverage is international.
Reuters	Reuters provides data, analysis, news, and charts for stocks, bonds, mutual funds, options, derivatives, and money markets. The data service portfolio on Reuters currently comprises over 80 global and regional content providers and 185 specialist data services. Contributed data consists of real-time, end-of-day and historical pricing information, spanning across all asset classes, sourced from leading investment banking firms, primary dealers and brokers and other key market makers. Sources: over 200 English and foreign language news sources, SEC filings and their international counterparts, trade publications, wires and proprietary surveys of investment banks, law firms and other advisors.
TFSD new issues database:	Thomson Financial Securities Data's (TFSD) New Issues database provides authoritative coverage of global equity issues, Eurobonds, U.S. Private Placements, and more. It is one of the leading sources of historical equities data. The database includes International equities – all cross border issues where the issuer sells shares outside their home markets, and Domestic equity issues. Includes sources of IFR Vigil screen service, Stock Exchange filings and prospectuses, new sources and wires, and proprietary surveys of all the major investment banks.
TFSD M&A database	TFSD's worldwide Mergers and Acquisitions database covers public and private transactions involving at least a 5% ownership of a company. Transactions include M&A, stock swaps, LBO's, spin-offs, rumored and seeking buyer deals, and more. U.S. deals date as far back as 1979, international deals to 1985. Updated daily, the data covers more than 273,000 transactions and offers more than 1400 detailed information elements.

Table 80: Bloomberg Items Definition

Item	Definition
BS_LT_BORROW	Long-term Borrowings: All interest-bearing financial obligations that are not current. Includes convertible, redeemable, retractable debentures, bonds, loans, mortgage debts, sinking funds, long-term bank overdrafts and capital (finance) lease obligations. Includes subordinated capital notes. Includes mandatory redeemable preferred and trust preferred securities in accordance with FASB 150 effective June 2003. Excludes short-term portion of long-term debt, pension obligations, deferred tax liabilities and preferred equity.
BS_MINORITY_INT	Minority Interest: Accumulated earnings in consolidated subsidiaries allocated to shareholders other than the parent company. Includes minority interest disclosed as an asset by the company.
BS_PENSION_RSRV	Pension Reserves (Liabilities): Pension reserves include the long-term provisions for pension benefits. It excludes pension liabilities payable in the short term and is not netted with pension assets. If a company's pension fund is not managed by outside trustee(s), its pension reserves are established within the company and they are very significant, they are included here. Includes provision or accrual for severance payments and pension reserves. If a company pays pension expenses or retirement indemnity expenses as they occur, they do not result in a liability in the balance sheet. The unaccrued liability cannot be computed and need not be included here.
BS_PFD_EQY	Non-redeemable preferred shares are included here. Preferred equity is shown at liquidation value, when disclosed. The excess value over par is subtracted from APIC. If the liquidation value is not disclosed, preferred equity is stated at par. Excludes any preferred with participating nature that is shown as a type of common share. Does not include mandatory redeemable preferred and trust preferred securities in accordance with FASB 150 effective June 2003; such securities are included in LT borrowing.
BS_ST_BORROW	Short-term Borrowings: Includes bank overdrafts, short-term debts and borrowings, repurchase agreements (repos) and reverse repos, short-term portion of long-term borrowings, current obligations under capital (finance) leases trust receipts, bills payable, bankers acceptances, and current portion of hire purchase creditors.
BS_TOT_ASSET	Total Assets: The total of all short and long-term assets as reported on the Balance Sheet.
CASH_AND_EQUIV	The sum of Cash & Near Cash Items and Marketable Securities and Other Short term investment.
EQY_FISCAL_YR_END	The week or month that a company ends their fiscal year. Companies can choose to report their annual financial results for a 12-month or 52-week period not ending on 12/31.
IS_EARN_BEF_XO_ITEMS_PER_SH	Basic EPS before XO: Basic EPS before Extraordinary Items excludes the effects of discontinued operations, accounting standard changes, and natural disasters. Early extinguishment of debt is only considered XO until the end of 2001. Includes the effects of other one-time gains/losses. Uses weighted average shares excluding the effects of convertibles.
MKT_VAL_OF_EQY	Calculated as (Closing Price as of period end date)*(Actual Shares outstanding at period end date).
NET_INCOME	Net Income (Losses): The profit after all expenses have been deducted. Includes the effects of all one-time, non-recurring, and extraordinary gains, losses, or charges.
SALES_REV_TURN	Sales/Revenue/Turnover: Total of operating revenues less various adjustments to Gross Sales. Adjustments are for: Returns, discounts, allowances, excise taxes, insurance charges, sales taxes, and value added taxes (VAT). Inter-company revenues are excluded. Revenues from financial subsidiaries in industrial companies are included if the consolidation includes those subsidiaries throughout the report. Revenues from Discontinued operations are excluded. Subsidies from federal or local government in certain industries i.e. transportation or utilities should be included.
TOT_COMMON_EQY	Total common equity is calculated using the following formula: Share Capital & APIC + Retained Earnings.

The definition given reflects the definition for "Industrials", the respective definition for "Banks", "Financials", "Insurances", and "Utilities" can be retrieved from Bloomberg or requested from the author, source: Bloomberg.

Table 81: Price Multiples from T-5 to T+5

		Parents											Subsidiaries				
		T-5	T-4	T-3	T-2	T-1	T	T+1	T+2	T+3	T+4	T+5	T+1	T+2	T+3	T+4	T+5
P/E	**Spin-offs**	**13.3**	**12.7**	**12.8**	**12.5**	**13.5**	**10.4**	**12.9**	**13.1**	**14.1**	**12.7**	**12.6**	**12.3**	**12.5**	**13.2**	**10.2**	**12.1**
	EU spin-offs	12.8	12.5	12.4	12.4	14.3	11.7	11.4	11.3	12.1	10.7	12.3	11.3	12.3	12.0	7.5	12.5
	US spin-offs	13.6	12.8	12.9	12.5	13.2	10.2	13.3	13.4	15.3	13.1	12.9	12.5	12.6	14.3	11.1	11.4
	Carve-outs	**13.2**	**14.5**	**14.2**	**14.7**	**14.5**	**12.0**	**12.1**	**12.4**	**11.9**	**13.1**	**14.3**	**13.8**	**13.1**	**13.0**	**13.1**	**12.9**
	EU carve-outs	13.5	14.3	15.8	20.6	18.9	14.1	15.3	13.6	9.1	8.2	10.4	15.1	12.7	11.3	12.2	13.8
	US carve-outs	13.1	14.5	13.1	12.9	13.0	10.6	11.0	12.1	12.2	13.6	14.7	13.3	13.4	13.1	13.2	12.8
P/B	**Spin-offs**	**1.68**	**1.73**	**1.58**	**1.75**	**1.69**	**1.93**	**1.89**	**1.92**	**1.89**	**1.88**	**1.88**	**1.77**	**1.76**	**1.69**	**1.63**	**1.71**
	EU spin-offs	1.16	1.31	1.24	1.40	1.33	1.58	1.53	1.21	1.39	1.39	1.49	1.38	1.28	1.30	1.15	1.45
	US spin-offs	1.83	1.89	1.69	1.88	1.81	2.05	2.09	2.00	2.01	1.99	2.08	1.81	1.94	1.77	1.83	1.71
	Carve-outs	**1.63**	**1.70**	**1.72**	**1.85**	**1.93**	**1.82**	**1.66**	**1.58**	**1.73**	**1.66**	**1.52**	**2.21**	**1.85**	**1.93**	**1.86**	**1.75**
	EU carve-outs	1.37	1.46	1.68	2.04	2.27	1.95	1.86	1.54	1.26	1.47	0.98	2.25	1.66	2.41	1.86	1.89
	US carve-outs	1.84	1.77	1.73	1.80	1.79	1.76	1.63	1.62	1.83	1.73	1.64	2.20	1.89	1.82	1.86	1.73
P/B	**Spin-offs**	**0.74**	**0.83**	**0.86**	**0.94**	**1.06**	**1.00**	**0.96**	**1.06**	**0.86**	**0.89**	**0.94**	**1.00**	**1.11**	**1.03**	**0.96**	**0.94**
	EU spin-offs	0.48	0.59	0.60	0.62	0.76	0.94	0.84	0.86	0.83	0.74	0.60	0.95	0.98	1.10	0.92	1.09
	US spin-offs	0.93	0.97	0.97	1.03	1.24	1.09	1.01	1.08	0.87	0.95	0.98	1.03	1.14	0.98	0.97	0.94
	Carve-outs	**0.83**	**0.85**	**0.93**	**0.96**	**0.96**	**0.99**	**0.94**	**0.84**	**0.88**	**0.93**	**0.81**	**1.32**	**1.09**	**0.95**	**0.91**	**0.78**
	EU carve-outs	0.60	0.55	0.78	1.11	1.03	1.14	0.92	0.73	0.75	0.83	1.34	1.52	0.84	0.86	0.58	0.67
	US carve-outs	0.92	1.04	1.04	0.96	0.95	0.98	0.95	0.86	0.99	0.94	0.72	1.29	1.13	0.96	0.97	0.80

Median P/E (market capitalization divided by earnings), P/B (market capitalization divided by book value of equity), and P/S (market capitalization divided by sales); based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003.

Table 82: Profitability and Leverage from T-5 to T+5

		Parent											Subsidiary				
		T-5	T-4	T-3	T-2	T-1	T	T+1	T+2	T+3	T+4	T+5	T+1	T+2	T+3	T+4	T+5
Ear./	**Spin-offs**	4.10	4.49	4.55	4.91	4.62	4.10	4.00	4.18	3.78	4.58	4.28	3.21	3.57	3.88	3.82	4.21
Rev.	EU spin-offs	3.02	3.85	4.27	4.46	3.98	4.69	4.29	4.02	4.07	3.82	3.96	4.30	4.87	5.21	4.31	6.36
	US spin-offs	4.67	4.68	4.75	5.27	4.85	3.94	3.96	4.22	3.69	4.96	4.52	2.73	3.17	3.72	3.70	3.90
	Carve-outs	3.96	3.81	3.78	4.16	3.61	4.99	4.22	3.77	3.17	4.30	4.36	4.36	4.10	3.58	3.24	2.40
	EU carve-outs	3.35	3.38	3.38	3.89	3.70	5.76	4.15	3.23	2.60	3.79	6.10	4.05	2.73	2.36	3.82	3.99
	US carve-outs	4.72	4.24	4.18	4.21	3.24	4.61	4.26	3.90	3.61	4.33	4.30	4.64	4.52	3.90	3.00	2.29
EBIT/	**Spin-offs**	7.91	8.46	8.56	8.07	7.80	7.86	7.94	8.28	7.63	8.11	7.98	6.29	6.77	6.89	7.35	8.00
Rev.	EU spin-offs	5.72	6.45	6.72	6.38	6.89	6.52	6.11	6.34	6.56	6.13	6.26	6.73	6.67	7.06	7.16	10.67
	US spin-offs	8.98	9.07	9.50	8.62	8.09	8.03	8.47	8.54	7.92	8.81	8.40	5.97	6.77	6.89	7.49	7.44
	Carve-outs	8.33	7.58	7.59	7.27	6.98	7.02	6.66	6.04	6.22	7.80	6.22	7.41	6.56	6.44	6.37	4.47
	EU carve-outs	7.00	6.45	6.75	6.58	6.25	6.30	6.02	5.45	4.43	5.32	6.18	6.09	4.88	6.44	7.30	7.62
	US carve-outs	9.19	7.67	8.12	7.57	7.51	7.53	7.09	7.52	7.35	8.22	6.34	7.97	7.04	6.50	6.07	4.24
Ear./	**Spin-offs**	3.63	3.82	3.84	3.69	3.55	2.67	2.81	3.16	3.51	3.22	3.74	2.91	2.97	3.29	3.52	3.72
Ass.	EU spin-offs	2.72	3.65	3.52	3.77	3.26	2.24	2.71	2.58	2.57	2.18	3.86	3.66	3.23	3.17	3.64	4.50
	US spin-offs	3.97	4.16	3.89	3.68	3.61	2.78	2.81	3.29	3.61	3.50	3.72	2.75	2.81	3.36	3.41	3.34
	Carve-outs	2.92	2.71	2.61	2.54	2.29	2.98	2.27	1.67	1.91	2.31	2.29	3.70	3.11	3.06	2.96	2.26
	EU carve-outs	2.18	2.58	2.71	2.42	2.86	3.82	2.55	1.95	1.42	2.86	4.05	3.04	2.23	1.44	3.34	4.08
	US carve-outs	3.54	3.03	2.43	2.58	2.09	2.67	2.21	1.58	2.04	2.26	2.13	4.33	3.38	3.21	2.95	2.23
Debt/	**Spin-offs**	27.9	28.3	27.8	27.1	27.1	28.2	30.1	31.0	30.3	30.6	29.0	25.1	26.1	28.3	26.9	27.0
Ass.	EU spin-offs	29.2	29.2	29.2	27.1	27.3	29.2	30.0	31.4	33.2	31.0	32.3	24.0	30.7	30.0	24.6	28.0
	US spin-offs	26.9	27.6	27.3	27.1	25.6	27.9	30.1	30.1	29.3	30.6	27.5	25.6	24.9	27.7	27.9	26.6
	Carve-outs	27.3	26.8	28.2	27.6	29.8	26.9	28.4	28.5	26.6	26.2	28.2	22.0	24.5	28.0	28.1	31.4
	EU carve-outs	29.4	28.8	28.2	29.2	28.6	28.8	26.6	28.0	24.0	25.9	24.3	24.4	23.6	18.8	22.0	27.2
	US carve-outs	26.1	26.0	28.2	27.2	30.0	25.2	28.6	28.7	27.6	27.7	29.4	20.8	24.8	28.8	29.3	31.5

Median Ear./Rev. (earnings divided by revenues; "earnings margin"); EBIT/Rev. (earnings before interests and taxes divided by revenues; "EBIT margin"); Ear./Ass. (earnings divided by total assets; "ROA"); and debt/ass. (financial debt divided by total assets; "debt-to-assets ratio") in %; based on a sample of 598 spin-offs and 650 carve-outs occurring in the USA and Europe between January 1990 and April 2003.

Curriculum vitae

Roger Rüdisüli from Amden (SG) was born on March 19, 1976 in Uznach (SG) as the son of Margrith and Jakob Rüdisüli. Roger Rüdisüli attended Primary and Secondary School in Gommiswald (SG) and subsequently the Grammar School at Kantonsschule Wattwil (SG), where he graduated in 1996 with Matura Type E (major in law and business). From 1996 to 2000, Roger Rüdisüli studied Business Administration with a major in Finance and Capital Markets at the University of St.Gallen HSG. During this time he completed an exchange term at the Instituto Tecnológico y de Estudios Superiores in Monterrey (Mexico), as well as several language courses abroad and internships with banks and consulting firms. From 2001 until 2003, Roger Rüdisüli worked as a management consultant with McKinsey & Company, Zurich. From spring 2003 till the end of 2004, he wrote the present PhD thesis and completed his doctoral studies. Since January 2005, Roger Rüdisüli has been working again at McKinsey & Company in Zurich in the Corporate Finance Practice.

Roger Rüdisüli von Amden (SG) wurde am 19. März 1976 in Uznach (SG) als Sohn von Margrith und Jakob Rüdisüli geboren. Roger Rüdisüli besuchte von 1983 bis 1991 die Primar- und Sekundarschule in Gommiswald (SG) und anschliessend bis 1996 das Gymnasium an der Kantonsschule Wattwil (SG), wo er mit der Matura Typus E abschloss. Von 1996 bis 2000 studierte Roger Rüdisüli Betriebswirtschaft an der Universität St.Gallen HSG mit der Vertiefungsrichtung Finanzen und Kapitalmärkte. In dieser Zeit absolvierte er auch einen Studienaufenthalt am Instituto Tecnológico y de Estudios Superiores in Monterrey (Mexiko), diverse Sprachaufenthalte und Praktika bei Banken und Unternehmensberatungen. Von 2001 bis 2003 war Roger Rüdisüli als Unternehmensberater bei McKinsey & Co tätig. Von Frühjahr 2003 bis Ende 2004 verfasste er die vorliegende Dissertation und absolvierte das Doktorandenstudium. Seit Januar 2005 arbeitet Roger Rüdisüli wieder bei McKinsey & Co. in Zürich im Bereich Corporate Finance.