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Valuation effects of Equity Carve-Outs in Europe

M.Sc. in Banking and Finance

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Abstract

The objective of this paper is to examine the valuation effects of equity carve-outs occurring in Europe between the time period 1998 to 2011. The stock market reaction and operating performance of parent firms selling equity in a wholly owned subsidiary, known as equity-carve-out, are investigated. The methodology used in this paper is separated in the stock market effects examining the announcement effects of equity carve-outs and the operating performance effects methodology. According the stock market effects methodology short-run horizon effects are examined using both the Market Model Abnormal Return approach and the Market Adjusted Model Abnormal Return approach in order to find statistically significant abnormal returns. The empirical results show evidence for value creation and efficiency improvement in the short-run surrounding the announcement date. The findings supports the empirical results of previous research studies such as Langenbach (2001), but also empirical results on US data of Shipper and Smith (1986), Klein, Rosenfeld and Beranek (1991), Hand and Skantz (1998), Allen and McConnel (1998), Chemmanur and Paegalis (2000), and Haushalter and Mikkelson (2001).

Additionally this paper provides empirical evidence in respect to the long-term stock market effect, examining Buy-and-Hold Abnormal Return. Empirical results show a highly significant underperformance of parent stock in the first year after the carve-out, where in the subsequent year, two-year period following the event highly significant positive abnormal returns are found. Moreover, it is shown that parent firms are more profitable as result of the equity carve-out.

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1.   Introduction

During the last two decades a distinctive element of corporate activity in Europe is corporate restructuring. In the period from 1990 to 1998 the amount of exchange-listed disinvestments in Europe reached approximately 100 billion Euros[1]. Hoskisson and Turk (1990) defined corporate restructuring as "a major change in the composition of a firm`s asset combined with major change in its corporate strategy". The corporations restructure with the aim to create value for company shareholders by focusing on core business, disposing of divisions, eliminating negative synergies between unrelated business segments, creating pure-play companies easier to evaluate for investors and reducing debt.[2] One important and popular portfolio restructuring tool that help corporations to increase value is an equity carve-out. Equity carve-outs are initial public offerings (IPO) of subsidiary equity where the parent firm usually keeps the majority ownership. In this context, the publicly traded parent company is "carving out" a part of it subsidiary`s outstanding shares through an IPO[3]. The recent explosion of equity separation started in the United States of America by focusing mostly on the high-technology sector, especially on units related to the internet.

From the academic point of view, the research object is extremely interesting because equity carve-outs combine two different elements of corporate restructuring mechanism. Foremost, this financial restructuring tool is a partial IPO which effects that a subsidiary firm goes public and raised its cash which affects immediately the parent firm. Second, an equity carve-out is similar to spin-offs and divestitures in the sense that the composition of the parents firm`s asset changes, and partially the control over the subsidiary is transferred from the parent firm to the shareholders. In fact, it is a hybridism which has captured in the past and captures furthermore researchers attention on which facet is expected to emerge, not only concerning value creation, but also concerning the motives for conducting carve-outs (rationale).

In the finance literature there exist numerous studies which investigate the market reaction to divestiture announcements including equity carve-outs. Shipper and Smith (1986), Slovin,Sushka and Ferraro (1995), Allen (1998), Vijh (2002), Hulbert, Miles

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[1] See Glatzel (2003),Converted to € at the average of daily exchange rate from 1/1/1990 to 31/12/1988 (approx. US\$ /€1.25)
[2] Gaughan, P. A. (2002), p. 395-403.
[3] Dr.V.R. Parthasarathy, p.1.

and Woolridge (2002) document that firms that undertake an equity carve-out experience positive average abnormal returns at the announcement date of carve-outs. For instance, Shipper and Smith (1986) report that the announcement of equity carve-outs by parent firms is associated with an average adjusted positive return to the stock of the parent firm of about 2%.

According to prior research the majority of the empirical work referring to this topic is based on US data, whereas the evidence in the European area is scarce. Motivated by this fact, this thesis emphasizes on the valuation effects of equity carve-out transactions in Europe. This paper investigates the valuation effects of 60 equity carve-outs taking place between 1998 and 2011 in Europe. The analysis is based on the stock market activity, both in the short-term run and in the long-term run, as well as on the operating performance of the corresponding parent firms. That differs from the most existing research studies which focuses only on the announcement effect. Examining both, short-term stock market effects and long-term stock market effects, the stock market response of 60 European parent firms undertaking an equity carve-out are provided. In order to examine the effect of equity carve-out announcements two models are applied in the short-term horizon in order to calculate abnormal stock returns: the Market Model and the Market Adjusted Model. However, for the analysis in the long-term horizon Buy-and-Abnormal Returns are measured for three different time windows: six months, one year and two years subsequent the event. According the operating performance effect analysis there are profitability, efficiency and growth measures selected in order to examine abnormal changes in firms` operating performance as impact of an equity carve-out.

This research also indents to provide a better understanding of the characteristics of an equity carve-out, and the sources of value creation by outlining empirical results of prior research studies on US and European data. In addition, the research gives an overview of the key rationales and drivers for the carve-out ant its value creation. In this context the dissertation intends to answer the following research questions:

- What are the characteristics of an equity carve-out?
- What are the key rationales and drivers for the carve-out?
- What are the sources of value creation?
- What are the valuation effects, both in short and long term?

- Which are the main similarities and differences between the obtained empirical results of this research and the empirical results of prior research studies?

The thesis is structured by focusing on the response to these research questions. Chapter 2 describes the fundamentals of equity carve-outs and the findings in literature. First, the definitions and characteristics are defined. Subsequently, an overview of reasons and motivations for carve-outs are given by focusing on empirical findings of prior studies. The key reasons such as the reduction of information asymmetries, efficiency hypothesis and fund raising are outlined. Subsequently, the sources of value creation, partly in accordance with the key reasons for an equity carve-out, are discussed. Finally, the announcement effects as well as the long-term stock market effects of US and European carve-outs are discussed.

Chapter 3 presents the sample selection and the methodology used in this research. After presenting the sample, the short-term effects stock market methodology and the long-term stock market methodology are described. Finally, the measures of operating performance and price multiples are presented. Chapter 4 focuses on the empirical tests and the empirical results of the 60 parent firms based on the methodology outlined in Chapter 3. According to the empirical findings, it is attempted to draw a line regarding the motivations and key drivers for equity carve-outs, as presented in Chapter 2, while on the same time present and explain the various valuation effects. Chapter 5 concludes by summarizing the results, outlining the valuation effects of European carve-outs and giving an outlook.

2.   Literature Review

In finance literature exist numerous studies which investigate the market reaction to divestiture announcements including equity carve-outs. Most prior studies on equity carve-outs focus on the stock performance of the parent company at time of equity carve-outs` announcement. According to the results of prior research there are two competing hypotheses, the asymmetric information and divestiture gains hypotheses postulating to predict the valuation effects of parent company`s stock performance. In this context the present chapter 2 intends to outline the fundamentals of carve-outs and to describe the motivation of carve-out transactions by focusing on the valuation effects. First the definition and characteristics of equity carve-outs are defined (Section 2.1.). Second, the reasons and motivation for such a restructuring tool are discussed (Section 2.2.) by focusing on value creation (Section 2.2.1), information asymmetries (Section 2.2.2.) and on the fund raising hypothesis (Section 2.2.3.). Third, the following section (Section 2.3.) discusses four sources of value creation: Increase of cash flows (Section 2.3.1.), reduction of capital costs (Section 2.3.2.), disclosure of hidden reserves (2.3.3.) and the reduction of information asymmetries (Section 2.3.4.). Subsequently, the announcement effects of European equity carve-outs are presented (Section 2.4.) and empirical studies on long-term stock market effects are discussed next (Section 2.5.).

2.1.   Definition and Characteristics

An equity carve-out is defined as a corporate restructuring tool where "a portion of a wholly owned subsidiary`s common stock is offered for sale to the public"[4]. According to this definition two different characteristics identify an equity carve-out. One characteristic is the public trading and the second one is the fact, that a carve-out affects a firm owned by another company.

As an additional definition, an equity carve-out is a sale of a stake in a non-listed subsidiary by a publicly traded parent company, through an initial public offering. Michaely and Shaw (1995) define an equity carve-out as follows:"In the case of an accompanying stock issue with acquisition of new capital, the separation is called Equity carve-out." According to this definition, an equity carve-out is considered as a sale of shares with simultaneous raising of new capital. Shipper and Smith (1986) and Vijh (1999 and 2003) state that shares sold to the market can be shares owned by the parent firm or newly issued ones sold by the subsidiary itself.

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[4] Shipper, K. and Smith, A. (1986)

There are five characteristics of the going public process:[5]

- A previously private company is converted into a public company.

- There is a possibility of a first-time participation by the public.

- Published securities are regularly traded.

- The number of shareholders increases.

- The emission leads to a capital inflow for the subsidiary, the shareholders or both.

Moreover, while prior to the carve-out the parent firm keeps the majority interest in the subsidiary, it is mostly common that even after the transaction the parent continues to own an ongoing interest mainly for tax and accounting purposes. If, for example, the parent`s ownership remains above 80%, it can continue to consolidate the subsidiary for both tax and accounting purposes. If it is less than 80% and more that 50%, the parent is allowed to consolidate the subsidiary only for accounting purposes but not for tax purposes. In the case of an ownership between 50% and 20%, the parent firm is obliged to use the equity method of accounting and below 20% the parent must use the cost method for its investment in the company.[6]

In general, the parent-subsidiary relationship remains also after the equity carve-out. The following figure illustrates the change of disposal rights prior to and after the equity carve-out.

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[5] Langenbach, W.(2001), p.230 f.
[6] Hunt, P. A. (2009), p.447.

Figure 1: Shareholders - Company relation in the case of an equity carve-out

Prior to the equity carve-out	After the equity carve-out
Shareholders Parent firm Subsidiary firm	Shareholders Shareholders Parent firm Subsidiary firm
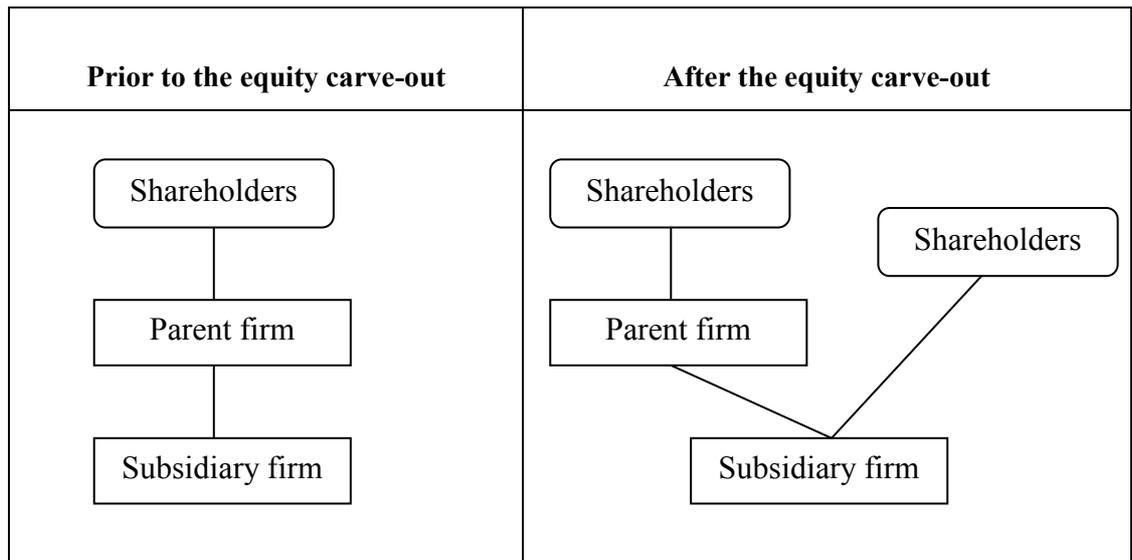
Source: Own representation

Equity carve-out transactions usually do not imply a 100% sale of the subsidiary as derived by figure 1, unlike spin-offs. Because of the characteristics of the equity carve-out transactions, parents normally carve-out an entity with attractive business. This is due to the fact that new investors are required to acquire the subsidiary shares. In fact, it would be difficult to attract new investors for a poorly performing entity. Another characteristic which differentiates carve-outs from spin-offs is the tax efficiency. Carve-outs are not really tax efficient, because the parent firm is obligated to tax any cash proceeds. As already mentioned in the previous paragraph, in the case of an ownership less than 80%, the parent company is no longer allowed to consolidate the subsidiary for tax purposes. This leads to the suggestion that tax efficiency is not the key driver for equity carve-outs.

The term "equity carve-out" is partly used as a synonym for the term "spin-off", because of their similarities.[7] Nevertheless, both terms have to be clearly separated. In the academic literature a spin-off is defined as follows: "A spin-off divides one firm into two; current shareholders receive a pro-rata distribution of separate equity claims on subset of the original firm`s net assets. Because continuity of ownership is maintained, any charge in value of owners` claims from the reorganization accrues to pre-spin-off shareholders."[8] The shares of the subsidiary are transferred exclusively to the current shareholders of the parent firm. In fact, it means that shareholders´ parent stock receives

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[7] Hennings, R. (1995), p.6 ; Rechsteiner, U. (1995), p. 20.
[8] Shipper, K., Smith, A. (1983), p. 437.

stock of the subsidiary on a pro-rata basis.[9] The spin-off transaction leads to two or more independent firms resulting from the parent company, without capital inflow occurred by the divesting process. Unlike equity carve-outs, in the case of a spin-off there is no aim to sell the subsidiary stock to the public.

In order to illustrate the differences between the two divesting tools Figure 2 demonstrates the change of the disposal rights prior to and after the spin-off.

Figure 2: Shareholders - Company relation in the case of a spin-off
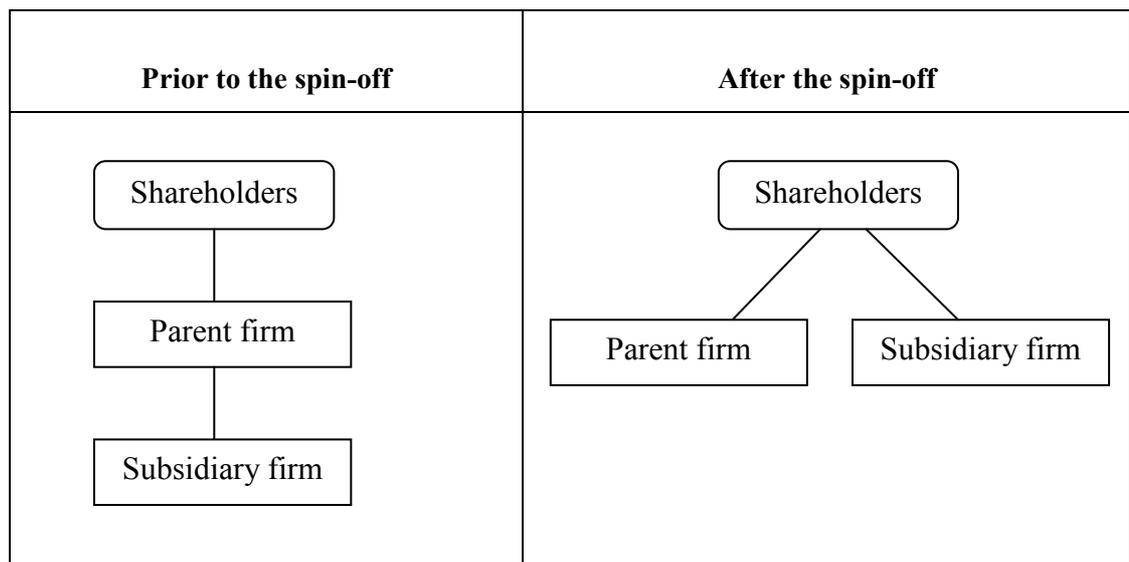
Source: Own representation

Whereas in the case of a spin-off the subsidiary stock is transferred to the existing shareholders, equity carve-outs are characterized by a capital inflow for both, the parent and subsidiary firm, occurred by the subsidiary`s IPO.

The following table summarizes in comparison the characteristics of both restructuring tools based on equity separation.

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[9] Shipper, K., Smith, A. (1983), p. 438.

Table 1: Comparison of Equity-Carve-Out and Spin-off

	Equity Carve-Out	**Spin-off**
Description	IPO of subsidiary	Parents distributes shares of subsidiary to existing shareholders
Degree of separation	Generally partial	Complete
Reversible	Dependent	No
Cash Proceeds	Yes	Yes (upstream dividend)
Taxability	Potential capital gains tax but avoidable depending on percentage carved-out, tax basis and business	Generally tax-free
Asset Transfer to New Company	Yes	Yes
Consolidation	Full tax consolidation if sell less than 20%	No Consolidation
Parent Control of New Company Cash Flows	No (generally)	No
Board of Directors	Separate	Separate

Source: L.E.K. Consulting Executive Insights Vol. III, Issue 1,p.1

In general, an equity carve-out performs as financial tool for corporate restructuring and value enhancement[10], which means that it combines characteristics of both restructuring and financing transactions. Equity carve-outs are a common applied divestment technique used by corporations to focus their core business. Parent firms choose to divest its subsidiary if they desire to increase efficiency through restructuring transactions and/ or in the case of generating cash by selling overvalued securities to the public through financial transactions.

The next sections focus on motivation for equity carve-outs and the objectives of their most common approaches.

2.2. Reasons and motivations for equity carve-outs

In the context of one common approach, the parent firm is selling less than 20% of the subsidiary to the public and divesting the remainder in a tax-free spin-off afterwards. A spin-off is a different mechanism of restructuring creating a stand-alone public entity

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[10] Parthasarathy, V.R. (not known), p. 1.

which is administratively as well as financially independent of the parent company.[11] As in the case of an equity carve-out, public trading in such a subsidiary, a spin-off subsidiary, achieves a few objectives. One advantage is that the parent is able to highlight the value of the subsidiary and benefit from the value created. In addition, this approach leads to a chief advantage, as mentioned by Shipper and Smith (1986) and Gilson et al. (2001): The parent can focus on its business, expand its own multiple and get valued by the market independently. Simultaneously, the parent can bring out subsidiary's growth opportunities and its contribution to the parent, prior to the full carve-out.

A second fairly common approach for the parent is to use the carve-out as financing source. Raising capital, as result of selling down a stake of the subsidiary to the public, represents a motivation for a carve-out transaction. As already mentioned above, in respect to the ownership structure, parents` ability to consolidate their subsidiaries for tax and accounting purposes can change. However, tax efficiency does not demonstrate a key reason behind equity crave-outs.

It is very likely, that some parents undertake a carve-out in order to create a more efficient entity, known as efficiency rationale in the literature[12]. Efficiency can be achieved from many sources. Nanda (1991) states that a carve-out entity may improve access to capital markets, which represents a source to increased efficiency. According Shipper and Smith (1986) and Gilson et al. (2001) the separate financial statements of parent and subsidiary and the publicly traded carve-out equity unable investors to collect and profit from information. In this context, this is known as hidden value in parent firms, which get unlocked by the equity carve-out transaction. Moreover, according to Shipper, K. and Smith, A. (1986) a driving force can be to ameliorate the managerial contracts.

An alternative motive for equity carve-outs is the financial rationale, which means that parent firms carve-out because the publicly traded subsidiary generates cash. This represents the most effective way of financing available for the parent company[13]. Using the carve-out entity as financial source, the parent firm takes advantage by reducing its debt.

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[11] Slovin, M.B. et al., p.91.
[12] Powers, E.A. (2003), p. 32.
[13] Powers, E.A. (2003), p. 32.

The following table provides an overview of the motivations behind equity carve-outs.

Table 2: Overview of reasons behind equity carve-outs

Motivation for equity carve-outs
- increase focus on core business   - highlight the value of the subsidiary   - improve the autonomy of component business   - improve the managerial incentive contracts   - enhance the visibility of the component being divested[14]   - increased information → information asymmetries   - increased access to capital markets   - fund raising   - reduce debt

The following sections emphasize on literature`s findings of value creation (Section 2.2.1.), information asymmetries (Section 2.2.2), fund raising hypothesis (Section 2.2.3) as driving forces for equity carve-outs.

2.2.1. Value creation

A review of the literature shows that most researchers report a positive stock market reaction to equity carve-out announcement for parent firms, that presumes that carve-outs are creating value. Table 3 provides an overview of the value creation during the announcement period documented in the literature. It is observed that the cumulative average positive abnormal returns range from 1.23 % to 2.75%.

Table 3: Announcement period effects documented in literature for US data[15]

Author	Estimation period	Time period	Sample	Event window	Return
Shipper and Smith (1986)	[-280; -161]	1965-1983	76	[-4;0]	1.83%
				[-13;0]	4.95%
Klein, Rosenfeld and Beranek (1991)	[-150; -50]	1966-1983	52	[-4;0]	2.75%
				[-1;0]	1.06%
Slovin, Sushka and Ferraro (1995)	[-240; -121]	1980-1991	32	[0;+1]	1.23%
				[-10; -1]	1.27%

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[14] Sudarsanam ,S. (2003), p.256.

[15] Estimation period and event window are frequented on a daily basis.

Michaely and Shaw (1995) (Master Limited Partnerships)	[-109; -10]	1981-1988	28	[-2;0]	1.20%
Hand and Skantz (1998)	[-450; -251]	1981-1995	265	[-1; +1]	2.29%
Allen and McConnell (1998)	[-450; -250]	1978-1993	188	[-1; +1]	2.00%
Chemmanur and Paeglis (2000)	[-245; -45]	1984-1985 and 1991-1998	19	[-1; +1]	1.96%
Haushalter and Mikkelson (2001)	[-215; -15]	1994-1996	31	[-1; +1]	2.18%
Vijh (2002)	-	1980-1997	336		1.94%
Vijh (2002)	[-500; -250]	1980-1997	336	[-1; +1]	1.93%
Hulburt, Miles and Wooldridge (2002)		1981-1994	185	[-1; +1]	1.92%

Shipper and Smith (1986) were the first who analyzed the effect of an equity carve-out announcement. In their study they compare the market adjusted positive return to an equity carve-out announcement with the negative share price reaction to a seasoned equity offering (SEO) announcement. Shipper and Smith explained the difference between equity carve-outs and seasoned equity offerings by the seed the asymmetric information hypothesis and by divestiture gains hypothesis. According to table 3, the authors estimate abnormal returns for 76 equity carve-outs over the period 1963 by using the market model gathering stock prices on a daily base for the 280-day period prior to the announcement date. The returns are estimated for the 85-day period surrounding the announcement date. They find an average market adjusted positive return to the parent`s stock of 1.83% over the announcement period (-4 through day 0). Additionally, the positive market reaction does not get diluted during the 40-day period after the announcement day.

In a study testing the divestiture gains and asymmetric information hypothesis by Hulburt, Miles and Woolridge (2002), it is shown that when the parent and the subsidiary are in the same industry the implications of both tested hypothesis on the effect of equity carve-out are ambiguous. By applying the adjusted returns method the authors find a positive adjusted return of 1.92% , which confirms the assumption that equity carve-outs create value.

Obviously, tax advantages and facilitation of merger and acquisitions are important reasons why firms would divest their equity / ownership of a subsidiary[16] , but in case of

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[16] Hite, G. and Owers J. (1983), p.421.

equity carve-outs tax purposes do not represent the key motivation for the divesting process.

2.2.2. Information asymmetries

Nanda (1991) , Nanda and Narayanan (1999) and Zuta (1999) are key references for explaining the implications of carve-outs based on reduced information asymmetries. Nanda (1991) has investigated why firms divest in general and stated that an equity carve-out represents good news "about the value of the existing equity in parent corporation"[17] for investors. The author supports the findings of Shipper and Smith (1986) according to the abnormal positive market adjusted return by its investigation.

Also Schipper and Smith (1986) and Chemmanur and Paeglis (2000) examine information asymmetries as reason for equity carve-out in their study, arguing that an equity carve-out transaction increases the quantity and quality of conveyed information about subsidiary´s and parent`s activity available to all public companies. Moreover, they document that equity carve-outs create "pure-play stocks" attracting new investors to generate a better knowledge of subsidiaries business due to the existing information transparency. The positive market reaction on the announcement day is explained by the capture of unlocked value of the subsidiary which differently is uncovered in a diversified company. Therefore the reduction of information asymmetries plays a significant role for the value creation occurred by carve-outs.

The results of the research study of Gilson, Healy, Noe and Palepu (1998) and Chemmanur and Paeglis (2000) according the reduction of the information deficit are in line with the findings of the previous outlined findings in past literature. The authors also document that an equity carve-out reduces the information asymmetries due to the fact that an increased number of market participants overview subsidiary`s activity, including analysts who focus more on the subsidiary`s activity than on parent`s business.

2.2.3. Fund raising hypothesis

In a divestiture, the initial public offering of the subsidiary enables the creation of shareholders` value by serving a number of purposes. This section concentrates on the purposes of raising capital. Both, parent and subsidiary, raise funds by the IPO transaction. The cash proceeds raised by carve-out transactions can be used to pay down

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[17] Nanda (1991), p.1717

debt, to finance activities like investment purposes of the parent and/or the subsidiary or to be paid out as a dividend. Moreover, the funds raised allow to finance the growth of either firm, reducing the need to assume additional debt which represents the equity carve-out as financing source. Therefore both, the parent and the subsidiary, have the opportunity to bring efficiencies to their respective balance sheet because of the carve-out.

In the literature there is found evidence which strongly supports that the main reason for conducting equity carve-outs is fund raising in the capital market. Allen and McConnel (1998) test empirically in their study a managerial discretion hypothesis of equity carve-outs where managers of the parent firm undertake equity carve-outs only in the case of limited capital sources. In order words, parents which are capital constrained are reluctant to carve out their subsidiary. The empirical findings show evidence for the managerial discretion hypothesis, which defines the equity carve-out as a financing solution supporting the need of cash flow as main motive for carve-outs.

Frank and Harden (2001) also find evidence that supports the fund raising hypothesis as main motive for conducting carve-outs. In their research they compare equity carve-outs and spin-offs focusing on corporate restructuring where the findings support the empirical results of Allen and McConnel (1998) suggesting that parent firms carve-out because of their cash needs. Also Powers (2002) finds evidence that supports the need of cash as main motive for carve-outs. Frank and Harden (2001) and Powers (2002) show that in a corporate restructuring process, corporations with poor performance choose the equity carve-out as restructuring tool while other corporations select spin-offs.

Moreover, Vijh (2002) argues that the main motive for equity carve-outs is fund-raising. In this research two different hypotheses are investigated: first, the "financing strategy hypothesis" is present in the case of raising funds in order to pay dividends, to pay down parent or subsidiary debt, to support working capital needs or to finance other activities except subsidiary investment; second, the "investment strategy hypothesis" occurs when cash-inflows is raised to finance subsidiary`s investment opportunities. Both examined hypotheses are based on the proceeds` destination.

According to the empirical findings of Schipper and Smith (1986), Allen (1998a), Powers (2001), and Frank and Harden (2001) parent firms carve out their subsidiary because the carved-out subsidiaries are more profitable and have higher growth than their parent firms. Thereby the authors conclude that carve-outs are undertaken in order to finance the growth opportunities of the carved-out entity. Therefore, there is also evidence that support another hypothesis, in fact the investment strategy hypothesis where the carve-out transaction is used as financial source especially in the case where subsidiaries act in high growth industries as shown by Schipper and Smith (1986) and Vijh (2002).

Hand and Skantz (1999) and Powers (2002) provide stronger evidence supporting fund raising as the main reason for conducting carve-out by investigating the presence of market-timing. In accordance to Power (2002) carved-out subsidiaries tend to be overvalued by the stock market. The author argues that the entire market response to carved-out entities is a proof that fund raising is the main motive for conducting carve-outs. Thus, while it is not necessary that corporations undertake carve-outs with a clear purpose for cash proceeds, they nevertheless profit from the subsidiaries' over valuation.

2.3. Sources of value creation

The sources of value creation can be derived from the reason and motives for conducting equity carve-outs as mentioned in the previous part (Section 2.2.). As shown, in finance literature there exists evidence which supports the key drivers for an equity carve-out. The present section sheds light on these key drivers as sources of value creation occurred by carve-out transactions.

Generally, the value enhancement belongs to the primary corporate goals, so that the management follows strategies, both individual business unit strategies and global corporate strategies, to increase the value of the company. Therefore it can be concluded that investment or disinvestment decisions are based on the value enhancement. The following part focus on the sources of value creation for parent firms due to the initial public offering of the subsidiary. In the context of an equity carve-out Hennings (1995) defines four different sources of value creation.

Figure 3: Opportunities for enterprise value enhancement in the context of an equity carve-out
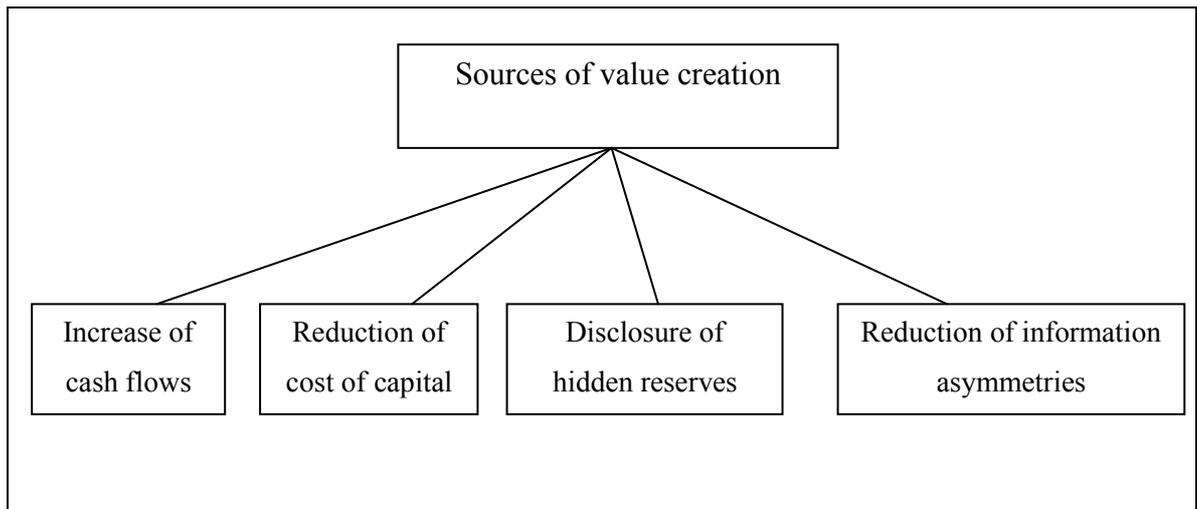
In accordance to Hennings (1995), p. 129

2.3.1. Increase of cash flows

The amount of increased cash flows due to an equity carve-out depends au fond on the consolidation purpose of the parent firm (balance sheet placement), the portion of shares sold and the achieved issue price for the shares sold in an initial public offering transaction.

If the sale of subsidiary`s shares takes place from the parent`s investment portfolio, the sales revenues affect directly the parent firm. Otherwise, if the equity carve-out occurs due to subsidiary`s capital increase without cum-rights of parent firm, so increases only the subsidiary`s equity in the amount of issue volume (Face value plus premium).[18] In this case the cash flow of the parent firm is not affected.

However, there exists also a mixed procedure of both described processes. In this context, the capital increase in the subsidiary is connected with the sale of parent`s shares. Sales revenue of the subsidiary`s IPO accrues to the parent where the sales revenue arises as result from the issue price multiplied by the number of shares sold. Both components affect directly the generated cash flow.

2.3.2. Reduction of capital costs

As already stated in the previous section, an equity carve-out can be used as financing source. The parent company raises its capital by undertaking an equity carve-out. From the perspective of the parent, the price-earnings ratio (P/E ratio) is of particular importance because it represents the relation of the price paid for a share

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[18] Langenbach, W. (2001), p. 234.

relative to the annual profit earned by the company per share.[19] Under the terms of capital of cost reduction parent firms shall prefer to undertake a carve-out if the subsidiary documents a higher P/E ratio than the parent firm.[20] This is observable in the case where the subsidiary belongs to a more profitable industry, an industry characterized by high P/E ratios and growth opportunities, in comparison with the parent`s industry.

Furthermore, the divestiture process reduces the risk of financial resources` misallocation within the company. This automatically leads to an improvement in the risk structure and risk profile of the company.[21]

2.3.3. Disclosure of hidden reserves

In the framework of a carve-out transaction, hidden reserves are disclosed. Hidden reserves are shares of equity capital which are not listed in the company`s balance sheet. As part of the restructuring of the company there is most likely a transfer of a portion of parent`s asset to the subsidiary. This transfer leads necessarily to a revaluation and economically reasonable classification of assets, liabilities and expense accruals. Although shareholders are owning partly hidden reserves, these are not reflected adequately in the share price because hidden reserves are not identifiable for external analysts. Therefore, a disclosure of hidden reserves can have a positive impact on the P/E ratio and thus also on the stock market performance. An additional advantage is that the disclosure of hidden reserves deprives management`s possibility to hide future losses or negative income changes by using hidden reserves. Due to this fact the transparency of management`s performance increases, which represents an additional advantage for investors.

2.3.4. Reduction of information asymmetries

The reduction of information asymmetries represents a significant source of value creation as discussed in section 2.2.2.. Langenbach (2001) argues that an equity carve-out reduces the information asymmetries between the subsidiary and actors in the capital market by improving the actuality, quality and quantity of subsidiary`s information.

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[19] Price-Earnings Ratio (P/E Ratio), Investopedia, retrieved 2012-03-09
[20] Mathesius, J. (2003), p.63
[21] Hornung, K., Wullenkord, A. (2001), p.60.

The stock market daily evaluates stock listed companies which increase their transparency where in the case of a carved-out transaction this increases considerable the transparency of the corresponding parent and subsidiary firm for evaluation purposes. This daily stock evaluation is represented in their listed prices available to all participants such as shareholders holding an interest in the subsidiary.

There exist several statutory requirements regarding the improvement of supply in capital markets which have to be fulfilled as part of an equity carve-out. Some of that statutory requirements are the discovery of financial statements for a newly formed corporation, extensive disclosure requirements within the context of an IPO.[22] Therefore, it can be concluded that the quality as well as the actuality of information of the participating companies improve in the course of an equity carve-out. Furthermore, the carve-out leads to an improvement of information`s quantity.

An additional source of value creation in the context of reduced information asymmetries is given by the disclosure of hidden reserves, depriving management`s possibility to hide future losses or negative income changes by using hidden reserves, as described by Hennings (1995).

2.4. Announcement effect for European carve-outs

Unlike the literature on the announcement effect for US carve-outs, outlined in Table 4 (Section 2.2.1) , the announcement period effect for European carve-outs has not been broadly tested. Table 3 provides some research studies on European equity carve-outs analyzing the announcement period return.

Table 4: Announcement period effects of European carve-outs[23]

Author	Country	Time frame	Sample	Event window	CAR
Ahlers (1997)	Germany	1984-1996	23	[-10;+10]	-1.0%
Bühner (1998)	USA and EU	1993-1997	10	day 0	-0,2%
Gibbs (2000)	EU	1999-2000	47	[-1,+1] [-30,+30]	2.5% 2.9%
Elsas and Löffler (2001)	Germany	1984-2000	39	day 0 [-10,+10]	1.1% 4.1%
Langenbach (2001)	Germany	1984-1999	32	[-1;+1] [-5,+5]	1.4% 3.1%
Veld and Veld-Merkoulova (2004)	EU	1987-2000	156	[-1,+1]	2.6%
Gleason, Madura and Pennathur (2006)	EU	1981-2001	129	[-1,+1]	-1.07%

Source: Rüdisüli, R., Amden SG (2005),p.71f.

[22] Mathesius, J. (2003), p.65
[23] Event window frequented on a daily basis.

Comparing the announcement effects of European carve-outs in Table 4 with those of US carve-outs outlined in Table 3, the announcement effect seems to be similar. Excluding Ahlers (1997) and Bühner (1998) the averaged cumulative abnormal returns for the announcement of equity carve-outs are positive, observing averaged cumulative positive abnormal returns range from 1.1 % to 4.1%. The first five research studies are characterized by a lower number of transactions compared to the US research studies, which leads to limited evidence. Nevertheless the study of Veld and Veld-Merkoulova (2004) is in line with previous US studies regarding the number of transactions. They found an averaged cumulative abnormal return of 2.6%, which is similar to the findings of US studies especially of Hans and Skantz (1998), Allen and McConnel (1998) with returns of 2.29% and 2.00% respectively. According to Veld and Veld-Merkoulova (2004) stronger announcement effects are observable the longer the event window, because information processing takes place not only after the announcement day but also prior to it.

Ahlers (1997) documents a cumulative average abnormal return over the 20-day event window of -1.0% where Bühner (1998) records also a negative cumulative average abnormal return on the announcement day of 0.2%.

Another study of value creation of European carve-outs represents the research study of Gleason, Madura and Pennathur (2006) , where 129 equity carve-outs between 1981 and 2000 are analyzed. The authors examine and compare the effects of parent firms who reacquire the subsidiary firm with no future reacquisition. They find a negative and insignificant market reaction in the case of reacquisition. Parent firms earn a significant averaged CAR of -1.07% over the three-day period.

2.5. Long-term performance effects

In the past literature also the long-term stock market performance are documented as an important part of analysis signaling that measuring abnormal returns only around the announcement day is not sufficient in the sense of capturing the total value created by equity carve-outs. Also in the long-term stock market performance research studies on US data are broader than on European carve-outs. Therefore the following table provides some research studies on equity carve-outs focusing the parent`s and subsidiary`s long-term stock market performance.

Table 5: Long-term Stock Market Effects[24]

Author	Time frame	Sample	Object analyzed	Event window	Return
Vijh (1999): BHARs adjusted by market index	1981-1995	628	Parent	[0, +12]	-5.8%
				[0, +36]	-4.3%
			Subsidiary	[0, +12]	1.3%
				[0, +36]	-2.9%
Vijh (1999): BHARs adjusted by size & B/M	1981-1995	628	Parent	[0, +12]	-0.6%
				[0, +36]	-0.7%
			Subsidiary	[0, +12]	5.2%
				[0, +36]	8.0%
Vijh (1999): CARs adjusted by size & industry	1981-1995	628	Parent	[0, +36]	-12.6%
			Subsidiary	[0, +36]	-5.7%
Vijh (1999): CARs adjusted by size & B/M	1981-1995	628	Parent	[0, +36]	-3.0%
			Subsidiary	[0, +36]	5.0%
Anslinger, Bonini, and Patsalos-Fox (2000)	1988-1996	46	Parent	[0, +24]	5.2%
		67	Subsidiary	[0, +24]	12.8%
Annema, Fallon, and Goedhart (2001)	1990-2000	200	Parent	[0, +24]	-21.5%
			Subsidiary	[0, +24]	-10.0%
Powers (2001)	1981-1998	181	Parent	[0, +12]	-7.7%
			Subsidiary	[0, +12]	-8.0%
Gleason, Madura and Pennathur (2006)	1981-2001	91	Parent	[0, +12]	-23.19%
				[0, +18]	-25.65%
		112	Subsidiary	[0, +12]	-16.15%
				[0, +18]	-24.44%

Source: Own preseantation

According the outlined research studies subsidiaries perform better than their parents in the first twelve months after the carve-out. It seems that the subsidiaries outperform the market and the matched firms. Generally, the long-term stock performance of carve-out firms are better than the one of their parents in all the investigated event windows. Referring to the empirical results of Annema, Fallon and Goedhart (2001) subsidiaries and parent firms mostly destroyed value in the 1990s.

The first who analyzed the long-term stock market performance of equity carve-outs in the USA were Klein, Rosenfeld and Beranek (1991). They investigated 52 carve-outs from 1996 to 1983 finding that the equity carve-out combines two events. The carve-out is the first event followed by either selling of the parent`s subsidiary stock or reacquiring the subsidiary`s stock. In the case of divesting parent`s remaining interest the authors find positive abnormal returns over both event periods. Also the

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[24] Event window is frequented on a monthly basis.

reacquisition of subsidiary`s stock as next stage after the equity carve-outs yields positive returns.[25]

Vijh (1999) examines the long-term stock market effects of 628 carve-out transactions occurring from 1981 to 1995 by using various approaches and benchmarks (see Table 4): Buy-and-Hold Abnormal Returns (BHARs), CARs, three factor Fama-French Model (1993). The author uses as benchmarks a value-weighted market index, size and book-to-market (B/M), industry and size, also earnings-to-price matching and parent firms. Using the BHAR and CAR approaches subsidiaries yield higher returns over each investigated time period after the carve-out than their parents. Parent firms earn negative returns in each event window resulting that they destroy value. Calculating CARs, the subsidiaries result in outperforming the three selected benchmarks and their parents by earning 5.0% (> -3.0% parent return) and -5.7% (> -12.6% parent return).

Anslinger, Bonini and Patsalos-Fox (2000) explore the long-term stock market performance of 46 parents and 67 subsidiaries taking place between 1991 and 1995. They analyzed the performance two years after the transaction and found that both parent and subsidiaries outperform their market index by 5.2% and respectively 12.8%. Also this research study shows that subsidiary stocks perform better in the long-run than the parent stock in average.

Annema, Fallon and Goedhart (2001) analyze 200 carve-outs worldwide taking place in approximately ten years. The findings of this research differ from the ones of the studies outlined in Table 4 due to the fact that in two years after the transaction both entities, parent and subsidiary, destroy value. Subsidiaries earn higher averaged BHARs of -10.0% than parents, yielding -21.5% in the two years following the transaction.

In another study Power (2001) reports an underperformance of 181 carve-outs from 1981 to 1998 in the first year after the transaction. Parent firms earn average BHARs of -7.7%, where the underperformance of subsidiaries is much stronger, -8.0%.

Gleason, Madura and Pennathur (2006) analyze BHARs for parents and carve-out units that are later reacquired by the parents. Returns documented in Table 4 represent

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[25] Rüdisüli, R., Amden SG (2005), p.80f.

the long-term stock performance of the entire parent and subsidiary sample. It is shown that both parents and subsidiaries fare poorly in the subsequent months after the carve-out event. In the twelve months after the carve-out parents yield a average BHAR of -23.19% where subsidiaries earn BHARs of -16.15% for the same event period. In fact, subsidiaries earn significant higher BHARs than parent firms over all investigated event windows. According to their findings the authors argue that carve-outs are not necessarily conducted for efficiency improvement.

In the context of long-term operating performance there is no empirical evidence found in the existing literature of carve-outs in Europe. Also empirical evidence on the long-term operating performance of US carve-outs is marginal.

Michaely and Shaw (1995) examine the long-term operating performance for 28 carve-out parents and 51 subsidiaries documenting a decline of the median return on assets (ROA) of -0.04% for the parents and of -5.01% for the carved-out subsidiaries from the year prior to the year after the equity carve-out. The authors support a slimly increase in parent`s leverage, defined as total debt to total assets, and a subsidiary`s decrease in indebtedness level.

Powers (2003) analyzes 181 equity carve-outs documenting that the mean ROA is relative stable over the subsequent five years where the operating performance of the carved-out entities declines compared to the industry. In the year of transaction the subsidiaries outperform the industry respecting the mean (median) ROA which is documented at 17.2% (15.9%). There are similar findings according operating performance measures such as sales and earnings growth rates, profit margin and capital expenditures. The author documents that parent firms systematically underperform their matching sample. Moreover parent firms have significantly more leveraged than the matching sample.

3. Sample selection and Methodology

Chapter 3 describes the sample selection and the methodology used for the analysis of the data. The subsequent section presents the selection of the working sample. The following section (Section 3.2.) describes the stock market effect methodology in the short-run (Section 3.2.1) and in the long-run (Section 3.2.2.). Subsequently, the measures of operating performance are discussed (Section 3.3 and Section 3.3.1.).

3.1. Sample selection

The sample for the study is chosen based upon several criteria. To identify European equity carve-outs the Thomson`s SDC database is searched through public offerings flagged as "spin-offs" during the period January 1,1998 through December 31, 2011 in Europe. The database defines a "spin-off" as "shares sold to the public (IPO), where the parent company held from 50% to 100% of the shares outstanding prior to the IPO"[26]. This definition given by Thomson corresponds to the academic literature`s definition "equity carve-out" given by Schipper and Shmith (1986). Subsequently, the results from the initial search are cross-referenced with information on all initial public offerings generated for the same time period in order to find equity carve-outs entering the IPO market over the same period. The sample excludes spin-offs defined by the academic literature. Additionally, searching through the Merger & Acquisition Thomson ONE`s database, equity carve-outs are identified by public offerings flagged as "equity carve-outs" in Europe over the investigated period, where the search focus only target companies, in this case the subsidiary firm, with the public status flagged as "subsidiary". Thomson Financial`s "equity carve-out" flag is defined as a sale of new company`s shares to the public via public offering. The database tracks equity carve-outs in the case of privatization and only if they represent 100% of the target shares.[27] By this way additional equity carve-outs are identified. The carved-out entities are also cross-referenced with the identified IPOs in Europe. Furthermore, information of two more equity carve-outs transactions occurred in Portugal are taken from a research paper entitled "*Equity carve-outs: restructuring or financing? The case of Portugese TMT carve-outs*"[28].

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[26] SDC FAQ, http://findb.aalto.fi/faq/sdc.html, retrieved 10.03.2012, (see appendix)
[27] http://mergers.thomsonib.com/DealsWeb/help/def.htm
[28] Padrao,R, Farinha, J. (zear published not known)

In fact, only common stock issues and no multiple securities such as bonds or stocks with warrants are included. Parent firms which are not listed at least 210 days prior the subsidiary IPO are excluded from the sample[29], because of the used methodology.

The first spin-off sample contains 548 transactions, which is matched with a sample of 9,106 IPOs to identify the European equity carve-outs entering the IPO market. The matched sample under all mentioned conditions contains 83 European equity carve-outs. Moreover, the search for equity carve-outs in Thomson`s Merger & Acquisition database resulted in 8 transactions excluding privatization carve-outs. Firms with a lack of historical stock performance in Bloomberg and finance yahoo database are also excluded. This resulted in a working sample of 60 European carve-outs as shown in Panel A of Table 6.

Panel A lists additionally the absolute frequency and relative frequency of the 60 equity carve-outs by year. As shown approximately 45% of the sample Equity carve-outs took place between 1998 and 2002, where in the years 2000 and 2001 the majority of the transactions are represented. Thus, about 55% of the European carve-outs took place between the years 2003 and 2011. A heavy carve-out activity is obvious in 2000. Referring to the sample the majority of equity carve-outs concentrates in the years 2000, 2001 , 2007 and 2011. According to the distribution by country shown in Panel A the most carve-out transactions took place in the United Kingdom with 16 carve-outs , 26,67% of the total, followed by Germany with 9 transactions, 15% of the total. Also in the Scandinavian countries, Sweden and Norway, are counted comparatively numerous equity carve-outs.

Panel B lists the descriptive reporting the industry classification of parents and subsidiaries obtained by Bloomberg database. The distribution of parent firm by the industry indicates that the parent firms of the working sample have the most firms in Telecommunications, Commercial Services and Electric industries. Carved-out subsidiaries are more common in Oil&Gas, Real Estate, Commercial Services, Media and Entertainment, Auto Manufactures and Chemicals industries.

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[29] This is due to the fact that the applied methodology (see Section 3.2) requires for the estimation period historical stock prices over the time period [-210,-11].

Table 6: Descriptive Statistics

Panel A: Construction and Selection of the Sample

	Spin-off	IPO
European firms on Thomson One`s database (1997-2011)	548	9106

	Equity carve-out
Matched sample	83
Firms searched as equity carve-out with subsidiary status (no privatization)	8
Equity carve-out transaction took by research paper	2
Firms with missing data or not listed in Bloomberg	(33)
Final Sample	**60**

Distribution by year:	Equity carve-out	% of Total
1998	4	6.67%
1999	5	8.33%
2000	11	18.33%
2001	6	10.00%
2002	1	1.67%
2003	2	3.33%
2004	3	5.00%
2005	1	1.67%
2006	4	6.67%
2007	7	11.67%
2008	5	8.33%
2009	1	1.67%
2010	4	6.67%
2011	6	10.00%

Distribution by country:	Equity carve-out	% of Total
Belgium	1	1.67%
Denmark	1	1.67%
Finland	2	3.33%
France	5	8.33%
Germany	9	15.00%
Italy	3	5.00%
Netherlands	2	3.33%
Norway	6	10.00%
Portugal	3	5.00%
Spain	2	3.33%
Sweden	8	13.33%
Switzerland	2	3.33%
United Kingdom	16	26.67%

Table 7: Descriptive Statistics (Continued)

Panel B: Industry Classification

Industry of Parent	Number of Firms	% of Total	Industry of Subsidiary	Number of Firms	% of Total
Telecommunication	5	8.33%	Oil & Gas	6	10.00%
Commercial Services	4	6.67%	Real Estate	5	8.33%
Electric	4	6.67%	Commercial Services	5	8.33%
Pharmaceuticals	4	6.67%	Media and Entertainment	4	6.67%
Oil&Gas Services	3	5.00%	Auto Manufacturers	4	6.67%
Chemicals	3	5.00%	Chemicals	4	6.67%
General Industrials	3	5.00%	Transportation	3	5.00%
Oil & Gas	3	5.00%	Software	3	5.00%
Food	3	5.00%	General Industrials	2	3.33%
Miscellaneous Manufactur	2	3.33%	Internet	2	3.33%
Insurance	2	3.33%	Materials	2	3.33%
Transportation	2	3.33%	Pharmaceuticals	2	3.33%
Media	2	3.33%	Retail	2	3.33%
Auto Manufacturers	2	3.33%	Telecommunications Water and Waste	2	3.33%
Mining	2	3.33%	Management	2	3.33%
Healthcare	2	3.33%	Oil&Gas Services	1	1.67%
Retail	2	3.33%	Mining	1	1.67%
Computers	2	3.33%	Insurance	1	1.67%
Iron/Steel	1	1.67%	Water	1	1.67%
Airlines	1	1.67%	Financials	1	1.67%
Water	1	1.67%	Healthcare-Products	1	1.67%
Materials	1	1.67%	Consumer Staples	1	1.67%
Investment Companies	1	1.67%	Environmental Control	1	1.67%
Engineering&Construction	1	1.67%	Biotechnology	1	1.67%
Real Estate	1	1.67%	Semiconductors	1	1.67%
Distribution/Wholesale	1	1.67%	Electrical Compo&Equip	1	1.67%
Financials	1	1.67%	Electric	1	1.67%
Software	1	1.67%			

3.2. Stock Market Effects Methodology

This paper applies the classical event study methodology[30], where financial market data are used in order to measure the impact of the equity carve-out event on the firm value. In the short-term analysis the impact of the equity carve-out can be examined by using the stock prices over a relatively short time period of [-10,+10] days around the announcement date. For this purpose historical stock prices are downloaded from Bloomberg database for the working sample. This paper uses the stock market price in the short-term announcement effect analysis because of the rationality in the market

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[30]Classical event study methodology is described by MacKinlay (1997)

place where the stock prices reflect immediately the effects of an event. In addition, to the short-term effect analysis the paper examines a long-term announcement effects, because there might be also long-term impact on the stock market occurred by the equity carve-out event.

Section 3.2.1. explains the short-horizon event study method where in Section 3.2.2. the applied methodology for the long-horizon event study are outlined. In section 3.2.1. three models estimating abnormal returns are presented. For the long-term analysis Buy and Hold Abnormal Returns (BHARs) for 6, 12 and 24 months are applied. Moreover, statistical tests are used for significance for both horizons.

The purpose of this stock market effect study is to test whether or not empirical observations of parents` stock behavior conform with the behavior predicted by one of the applied models conditional on the equity carve-out event.

3.2.1. Short-term event study method

In the short-horizon analysis there are two approaches used in the analysis of daily abnormal returns: the Market-Model Abnormal Returns and the Market-Adjusted Abnormal Returns.

The first model used to calculate abnormal returns, the Market Model, estimates the systematic risk of each parent firm relative to the corresponding market index. According to Brown and Warner (1985) it is a powerful and a well specified model under a variety of conditions. Further, MacKinlay (1997) also supports the explanatory power of the Market Model by comparing the limited gains from more sophisticated multi-factor derivations of the Market Model. In order to calculate abnormal returns using the Market Model, expected returns have to be estimated using ordinary least squares (OLS). Firstly, we have to estimate the Market Model equation by OLS using the relevant data from the estimation window [-210,-11], whereby the date of announcement equals day zero :

$$R_{j} = \alpha_{j} + \beta_{j} R_{mt} , \qquad (1)$$

where,

R_j is the estimated log-return on each firm j over the estimation window

R_{mt} is the estimated log-return on the market index

α_j & β_j are the OLS parameters estimated for each security over -210 through -11 days relative to the announcement day.

Secondly, the daily abnormal returns applying the Market Model Abnormal Returns are given by the following equation:

$$MMAR_{jt} = R_{jt} - R_j \qquad (2)$$

$$MMAR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt})^{31} \qquad (3)$$

where,

$MMAR_{jt}$ is the Market Model Abnormal Returns on security i over time t

R_j is the log-return on each firm j over the estimation window

R_{mt} is the log-return on the market index

α_j & β_j are the OLS parameters estimated for each security over -210 through -11 days relative to the announcement day.

The second model used, Market Adjusted Abnormal Returns (MAAR), defines the abnormal return as the excess return on a security j adjusted on its listed market index over the same time t. The characteristic of this model is its simplicity in implementation and interpretation. The Market Adjusted Model is assuming that the systematic risk of each security and the market is identical, claimed by Brown and Warner (1980). MAAR is calculated as follows:

$$MAAR_{jt} = R_{jt} - R_{mt,} \qquad (4)$$

where,

$MAAR_{jt}$ is the Market Adjusted Abnormal Returns on security i over time t

R_j is the log-return on each firm j over the estimation window

R_{mt} is the log-return on the market index.

The length of the event period is for both models identical, [-10,+10]. The cumulative abnormal returns (CARs) over the event period are calculated by summing the daily abnormal returns in the case of both applied models.

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[31] Bucheim, A. et al (2001), p. 22.

In order to test the significance for abnormal returns the student`s t-test is used. If the null hypothesis is supported the test statistic follows a student`s t distribution. Commonly, it is applied when the test statistic follows a normal distribution. In this context, the student`s t-statistic tests for statistical significance, by testing the null hypothesis, that the calculated abnormal returns, by the applied models, are zero over the event window [-10, +10]. The equation for the t-student is given by:

$$test\ statistic = CAR_{pt} / \sigma\ (AR_{pt}) * T^{1/2} \qquad (5)$$

where,

CAR_{pt} is the cumulative abnormal return on a portfolio of N events for a given time period t[32]

$\sigma\ (AR_{pt})$ is the standard deviation of abnormal returns for a given time period t.

The standard deviation, or well the variance, is calculated as shown by Brown and Warner (1985) in the case of the Market Adjusted Model. The calculation of variance in the Market Model differs. Firstly, MMARs for each security are calculated over the estimation window [-210,-11]. Secondly, the standard deviation of the averaged MMARs on the portfolio are calculated for each day in the estimation period. Thirdly, the standard deviation of the averaged MMARs are used and plugged in equation (5) in order to calculate the t-student test statistic for the Market Model, as shown as follows:

$$test\ statistic = CAR_{pt} / \sigma * T^{1/2} \qquad (6)$$

3.2.2. Long-term event study method

The most commonly used methodology for long-term analysis is the Buy-and-Hold Abnormal Returns. Agrawal, Jaffe, and Mandelker (1992), Rau and Vermaelen (1998), Cusatis, Miles, and Woolridge (1993) and Inkenberry, Lakonishok, and Vermalen (1995) show that the long-term effect analysis is necessary because the valuation effects of restructuring may occur also in the long-horizon and not only at time of the announcement.

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[32] CARs are calculated for every day through the event window.

In this paper BHARs are computed using daily data for 125, 250 and 500 days (6, 12 and 24 months) one day post the announcement day of the equity carve-out as the difference between the compounded actual return of the parent and the compounded return of the market.

$$BHAR_{it} = \prod_{t=0}^{T}[1+R_{it}] - \prod_{t=0}^{T}[1+R_{mt}]$$ (7)

where,

R_{it} is the time t log-return on security i

R_{mt} is the time t log-return on the market index .

Also in the long-term horizon analysis BHARs are tested for the statistical significance. Firstly, the t-statistics for the different normal return estimation procedures are computed. Due to the fact that market returns are used as reference portfolio in order to estimate normal returns, the distribution of abnormal returns in the long-runs are positively skewed. This results in misspecified t-statistics, for which reasons the skewness-adjusted t-statistic[33] is calculated as shown by equation (8):

$$t_{Skewness-adjusted} = \sqrt{N}(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6N}\hat{\gamma})$$ (8)

where,

N   is the number of events in the sample

S $S = \dfrac{ABHAR_t}{[\sigma(BHAR_t)]}$

$\hat{\gamma}$ is the coefficient of skewness,

estimated $\displaystyle\sum_{i=1}^{N} = \dfrac{(BHAR_{i,t} - ABHAR_t)^3}{[N\sigma(BHAR_t)^3]}$

$ABHAR_t$ and $\sigma(BHAR_t)$ are the sample mean and cross-sectional standard deviation of buy-and-hold returns for the sample of N events.

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[33] see Pastor-Llorca and Martin-Ugedo, (2004)

Although this model faced a lot of criticism the chief advantage is that BHARs simulate most accurately the effect of an investigated event on an portfolio of securities because of compounding.[34]

3.3. Operating Performance Effects Methodology

.In this section the long-run operational performance effects based on the carve-out transaction are examined. The following part discusses which operating performance measures are selected in order to analyze abnormal changes in a three-years period beginning from the year prior to the equity carve-out to one year subsequent the event.

3.3.1. Measures of Operating Performance

There are several measures of operating performance in the literature. Following the measures of operating performance used by Barber and Lyon (1996), this paper measures profitability by using return on assets (ROA[35]), earnings before interest, tax, depreciation, and amortization (EBITDA) and return on equity (ROE). Leverage is measured by the ratio of book value of total debt to book value of total assets. Moreover, asset growth is used as growth measure.

All the financial statement data or ratios are downloaded from the Bloomberg database. The change in profitability, leverage and asset growth is computed by examining the three-year period, [-1,0,+1], beginning from the year prior the equity carve-out, denoted as year - 1, to the year after the transaction, denoted + 1, where year 0 symbolizes the carve-out event. Firstly, the corresponding measures are averaged in order to compute the abnormal change in ROA, EBITDA, Total Debt/Total Assets and Asset growth for the event windows [-1,0], [0,+1] and [-1,+1]. To assess whether there is an abnormal change in operating performance based on annual-frequency, there is also the median of operating performance for the relevant investigated time period presented, where the median values are less sensitive than the average values.[36]

Using the forecasting and econometric analysis software EViews two tests for equality are computed: test for equality for mean and median. According the first one, the two-tailed student t-test[37] is used which tests the null hypothesis that the mean of the

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[34] Bucheim, A. et al (2001), p. 28.
[35] ROA is defined as ratio of EBITDA to total assets
[36] Rüdisüli,R., Amden, SG. (2005), p.128.
[37] see section 3.2.1, where the student t-test is explained

paired differences of the two samples (here: two different time periods) is zero. In order to test the statistical significance of the change in median operating performance the nonparametric Wilcoxon Mann-Whitney test is applied. According to Barber and Lyon (1996) the nonparametric test statistics are more powerful than parametric t-statistics for comparing two populations. It tests the null hypothesis that two populations have identical distribution functions. The alternative hypothesis states that the two populations have different distribution functions with respect to their median (location). The Wilcoxon Mann-Whitney test does not require an assumption of a specific distribution, such as the normal distribution. Usually it is applied in place of the two sample t-test in case where the normality assumption is questionable.[38]

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[38] Easton, V. J., McColl, J. H., Statistics Glossary, www.stats.gla.ac.uk, retrieved 17.04.2012

4.   Data Analysis & Results

This section provides the results of the sample analysis using the stock market effect event methodology (Section 4.1. and 4.2.) and the operating performance event methodology (Section 4.3.).

4.1.   Results of short-term stock market effects analysis

Table 8 represents the averaged abnormal returns (ARs) with the relative t-test statistic values and the averaged cumulative abnormal returns (CARs) for the European parent firms. The results are obtained by using the Market Model for the event time period [-10,+10], where day 0 is the announcement day.

Table 8: Results of Market Model approach

| Event window	AR %	t-statistic	CAR%
-10	-0.841%	-1.590	-0.841%
-9	-0.052%	-0.094	-0.893%
-8	-0.363%	-0.657	-1.256%
-7	-0.104%	-0.188	-1.359%
-6	0.012%	0.021	-1.347%
-5	-0.024%	-0.043	-1.371%
-4	-0.154%	-0.280	-1.526%
-3	0.005%	0.009	-1.521%
-2	-0.260%	-0.471	-1.780%
-1	0.265%	0.479	-1.516%
0	1.371%	2.485***	-0.145%
1	0.126%	0.229	-0.018%
2	-0.348%	-0.630	-0.366%
3	0.093%	0.169	-0.273%
4	-0.469%	-0.851	-0.742%
5	-0.081%	-0.146	-0.823%
6	-0.059%	-0.106	-0.882%
7	-0.504%	-0.913	-1.385%
8	-0.379%	-0.686	-1.764%
9	1.408%	2.552***	-0.356%
10	-0.247%	-0.447	-0.603%

Asterisks indicate significance at the 10% (*), 5% (**) and 2%(***).

As shown in Table 8, parent firms experience a highly significant positive abnormal return of approximately 1.37 % on the day of announcement. It is also the highest occurred abnormal return over the event window. In addition, a highly significant positive abnormal return is observable in the first nine days after the carve-out announcement. Both significant positive returns are different from zero on a confidence

level of 99%. This positive market reaction of the equity carve-out announcement symbolizes a value creation for parent`s shareholders. Also the one day prior and post the carve-out announcement denotes positive abnormal returns. Nevertheless, regarding the CARs over the 20-day period there is a small decrease of approximately 0.6 % in the expected parent stock price under the market model observable.

Additionally to Table 8, the calculated averaged abnormal returns of the entire sample, 60 parent firms, using the Market Model for the announcement period are outlined in Figure 4. A plot of averaged abnormal returns is depicted for the 20 days surrounding the announcement date showing the results graphically.

Figure 4: Averaged Abnormal Returns by the Market Model approach
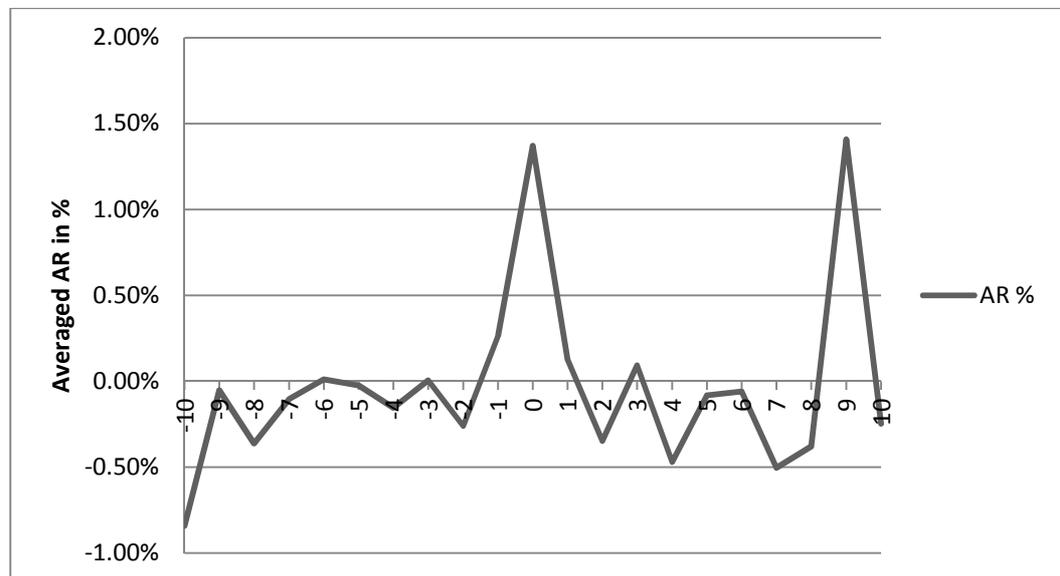
On the first glance it is apparent, that European parent firms fare poorly regarding their stock performance before the equity carve-out announcement. Obviously the announcement of equity carve-outs conveys a significant part of useful information for the market valuation of the parent firms. The information processing and market revaluation happens after the event day as indicated by Figure 4. In the previous day around the announcement date there is a clear increase until day 0. Therefore, it is clear that the announcement of the subsidiaries initial public offering has a relevant positive effect on parent stock price. In the subsequent eight days around the announcement date there is a clear decrease where parent firms earn negative returns in average. The significant increase of significant abnormal returns on the announcement day is clearly observable. Also Figure 5, shows evidence on the positive stock market reaction of

carve-out announcements by plugging the CARs of the parents for the event window [-10,+10].
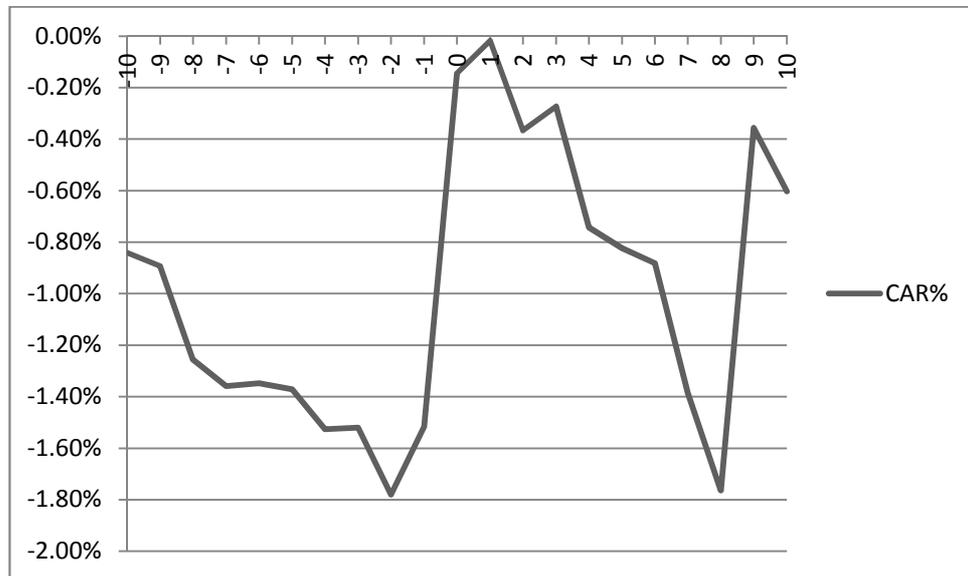
Figure 5: CARs by Market Model

Table 9 outlined the corresponding results to Figure 5. There is a highly significant positive CAR of 1.64% for carve-outs over the two-day period on a confidence level of 98% and a significant positive CAR of 1.76% over the three-days period on a confidence level of 95%. The positive and significant abnormal returns in the event window (-1,+1) seem to be driven by the averaged abnormal return of the announcement date.

Table 9: Announcement period CARs by Market Model

Interval	CAR %	t-statistic
CAR (-10 ,+10)	-0.603%	-0.249
CAR (-10, -1)	-1.516%	-0.906
CAR (+1,+10)	-0.458%	-0.274
CAR (-5,+5)	0.703%	0.299
CAR (-5, -1)	-0.168%	-0.142
CAR (+1, +5)	-0.679%	-0.574
CAR (-1, +1)	1.762%	1.923**
CAR (-1, 0)	1.636%	2.186***

Asterisks indicate significance at the 10% (*),
5% (**) and 2%(***).

The Market Model Abnormal Returns are supporting the findings of previous European research studies. The CAR over the three-days window (-1,+1) is in line with

the findings of Langenbach (2001) documenting 1.4% CAR over the same period. Gibbs (2000) find a higher, but also significant positive, CAR for 47 equity carve-outs occurring between 1999 and 2000 of 2.5%. The results of this research paper also supports some findings of documented in literature for US data such as Klein, Rosenfeld and Beranek (1991), Hand and Skantz (1998), Allen and McConnel (1998), Chemmanur and Paegalis (2000), Haushalter and Mikkelson (2001) and Vijh (2002), where later has a very broad sample not really comparable with the present working sample.

The Market Adjusted Model daily results are not exactly consistent with the Market Model daily results. The calculated abnormal returns by the second applied model are not highly statistically significant which differs from the results obtained by the Market Model where average abnormal returns of the announcement date are statistically significant on a confidence level of 99%. The difference can be explained by the characteristics of the Market Adjusted Model. It assumes that the expected return on a security for a given time period is predicted only by the return on the market index for the same time period. The Market Adjusted Model provides an average abnormal return on the announcement date of 0.99%, which is statistically significant on a confidence level of 90%.

Table 10: Announcement period CARs by Market Adjusted Model

Interval	CAR %	t-statistic
CAR (-10 ,+10)	-4.819%	-1.942**
CAR (-10, -1)	-3.898%	-2.276***
CAR (+1,+10)	-1.910%	-1.115
CAR (-5,+5)	-1.153%	-1.021
CAR (-5, -1)	-1.385%	-1.143
CAR (+1, +5)	-1.439%	-1.189
CAR (-1, +1)	1.227%	1.309*
CAR (-1, 0)	1.180%	1.541*

Asterisks indicate significance at the 10% (*),

5% (**) and 1%(***).

Table 10 shows highly significant negative CARs for equity carve-outs of approximately - 4.20% over the entire event period of 20 days on a confidence level of 95% and a higher significant negative CAR of -3.90% over the event window [-10,-1] on a confidence level of 99%. According the announcement effect, CAR (-1,+1) and CAR (-1,0), there are significant positive CARs of approximately 1.23% and 1.18%

respectively on a confidence level of 90% observable. By comparing the results for the same announcement periods, both model provide similar positive results according the value creation of carve-outs announcement for parent firms but the Market Model shows higher statistically significant CARs. Nevertheless, there is an empirical evidence that the announcement of an equity carve-out as restructuring tool creates value for the divesting parent firms.

In Figure 6, a plot of average CARs is depicted for the 20 days surrounding the announcement date. In average there is a poorly stock performance of the 60 parent firms observable, demonstrated by the negative CARs over the 20-days. Regarding the graph, the announcement of carve-outs obviously conveys a significant proportion of information for the market valuation of parent firms and increases the information available to all public companies. This can be shown by the clear and strong increase of parent stock price at the date of announcement.

Figure 6: CARs by Market Adjusted Model
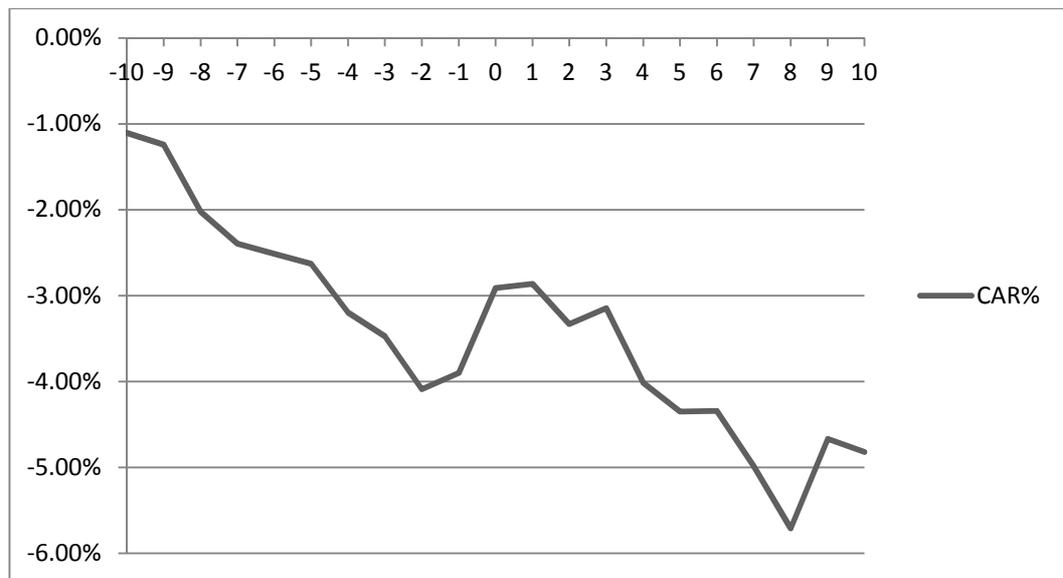
Moreover, it seems that the market revaluation occurs immediately before and after the announcement date. Parent stocks begin to create value by the increase of stock prices two days before day zero from -4.09% to 2.91%, stay constant immediately after the announcement day and decline then. In the subsequent nine days there is a clear increase from -5.71% to -4.82%, which let conclude that the parent stock get revaluated by the market after the announcement day.

By comparing the empirical results of both applied models, there are higher significant findings by using the Market Model approach. However, both show evidence on the positive market reaction of carve-out announcements which supports empirical findings of several previous research studies as outlined before.

The significant carve-out announcements on European parent` stock performance can be explained by the reduced information asymmetries and by the optimism separating subsidiary`s business from parent`s activity into two entities that can be valued by the market independently. Also few days after the transaction parent stock increase in value. In fact, the announcement of a carve-out is received by the market as good news based on the empirical results of this paper. It is striking that European firms who choose to divest are generally underperforming, which can confirm the motive and reasons for an equity carve-out decision outlined in the previous sections. By focusing on their own business and reducing information asymmetries to name a few, parent firms seems to be motivated for selling their wholly owned subsidiary in order to create shareholders value and to improve company`s efficiency.

After examining the short-term announcement effects of European carve-outs focusing on parent firms, the following section provides the results on the long-term stock market analysis.

4.2. Results of long-term stock market effects analysis

Table 11 represent the results of the long-term stock market performance showing that there are highly significant BHARs for carve-outs over all event windows.

Table 11: Post-carve-out buy-and-hold abnormal returns

	Month (+1 , +6)	Month (+1 , +12)	Month (+1 , +24)
BHAR	-16.60%	-33.67%	39.11%
t-statistic	-3.38***	-4.13***	3.12***
Parent sample	N= 59	N=54	N=46

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

The parent sample differs for each event window because there are no available historical stock performance for some parent in the following months and years after the equity carve-outs. Obviously, parent firms fare poorly in the month following the carve-out. For the first two periods parents earn negative BHARs, significant on the

confidence level of 99%. In the twelve months after the event parents perform worst earning a highly significant average BHAR of -33.67%. This changes drastically in the subsequent year. Table 9 shows highly significant positive BHARs of 39.11% in the two-year window after the carve-out event. Specifically, in the first year the findings represent an evidence of long-term underperformance. According to that findings carve-outs do not necessarily lead to efficiency improvement. The results contrast with Vijh (1999), who does not find evidence of the underperformance in the long-run after the carve-out. The results support Gleason, Madura and Pennathur (2006) who document a significant strong underperformance for all three periods, specifically in the following 18 months afterwards. The lowest earned post-carve-out BHAR occurred in the 18 months following the carve-out of -25.65%.

Regarding the two-years period there is an evidence of long-term overperformance. Holders of parent`s stock earn a highly significant BHAR of 39.11% on a confidence level of 99%. Therefore, it cannot be concluded for all long-time horizons that a carve-out does not lead to efficiency improvement. The results suggest that after a two-year period carve-outs conduct for value creation. The drastically increase about 200% from BHAR (+1,+12) to BHAR(+1,+24) , or well the change from the negative BHAR to positive BHAR is highly significant and unprecedented. This result represents a new empirical finding analyzing the long-term effects of equity carve-outs documented in research studies which analyzes long-term effects on US and European data.

4.3.　Results of long-term operating performance analysis

In the context of the explanation for value creation of carve-outs the following results of parents operating performance in the three-years around the carve-out transaction show the existence of abnormal changes operating performance measures. Table 12 and 13 report the results of the profitability analysis for the parent in the three-years period surround the equity carve out. In order to evaluate parent`s profitability in respect to the carve-out transaction, Table 12 presents the abnormal changes of ROA from the year prior to, to the year after the transaction. Parent firms increase their profitability over the investigated time period. The mean (median) ROA of parent firms increases from 4.4% (3.17 %) in the year -1 to 9.17% (3.63 %) two years later. In the year of transaction, year 0, the mean (median) ROA is 5.41% (4.34 %). The ROA measures is influenced by the following factors: Profit for the financial year, sales and

total assets.[39] In other words ROA can be split into the profit margin and the asset turnover showing the reasons of an increase of ROA. The increase in sale, while lowering expenses, followed by the equity carve-out transaction causes an increased ROA as shown in Table 12 in the year of transaction. The positive abnormal change of ROA over the entire period investigated assumes that parent firms control their costs in order to not exceed their revenues, which supports a continued improvement of profitability over the three-years period.

Table 12: Return on Assets (ROA)

ROA	-1	0	1
Mean (in %)	4.438	5.421	9.169
Median (in %)	3.172	4.335	3.635
Observation	56	57	49
ROA	(-1, 0)	(0, 1)	(-1 +1)
Mean differences (in %)	0.984	3.748	4.731
p- value	0.631	0.453	0.363
Median differences (in %)	1.163	-0.701	0.463
Wilcoxon p-value	0.339	0.879	0.454

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

The second profitability measure shows also an improvement over the investigated time period. Table 13 presents the mean (median) ROE of carve-out parents which increases drastically from 13.84% (5.93%) in the year prior the transaction to 41.31% (15.65 %) in the year of the transaction. Parent firms improve their profitability also one year later to 58.04% (13.16%). The abnormal change of median ROE is significant on a confidence level of 95% for the event period [-1,0] and over the entire investigated period [-1,+1]. ROE is the basic measure of firm`s efficiency. According to the DuPont System ROE depends on cost control, the ability of assets to produce sales and leverage, where the later one is defined as total assets to equity.[40] In fact, the benefit shown in Table 13 can also be derived from the dividend on sold shares or from a combination of dividends and reinvestment in the company.

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[39] ROA which is defined as EBITDA to total assets can be split into EBITDA to Sales multiplied with Sales to Total assets (ROA= $\frac{Profit(EBITDA)}{Sales} * \frac{Sales}{Total\ Assets}$)

[40] ROE can be split into :ROE = $\frac{Profit}{Sales} * \frac{Sales}{Assets} * \frac{Assets}{Equity}$

Table 13: Return on Equity (ROE)

ROE (in %)	-1	0	1
Mean (in %)	13.836	41.308	58.042
Median (in %)	5.926	15.647	13.162
Observation	55	56	47

ROE	(-1, 0)	(0, 1)	(-1 +1)
Mean differences (in %)	27.472	16.734	44.206
p- value	0.335	0.742	0.319
Median differences (in %)	9.721**	-2.485	7.236**
Wilcoxon p-value	0.005	0.502	0.016

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

The results of these profitability measures lead to the conclusion that carve-out parents improve their profitability in the long-run, although the abnormal changes of ROA are not statistically significant.

According the third measure of operating profitability is based on firm`s operating cash flow. EBITDA is earning measure which is of particular interest for companies with large amount of fixed assets including high depreciation charges.

Table 14: EBITDA

EBITDA	-1	0	1
Mean (in €m)	592.680	283.759	369.348
Median (in €m)	6.293	2.640	3.583
Observation	51	52	45

EBITDA	(-1, 0)	(0, 1)	(-1 +1)
Mean differences (in €m)	-308.921	85.590	-223.332
p- value	0.618	0.8368	0.7514
Median differences (in €m)	-3.654	0.944	-2.710
Wilcoxon p-value	0.114	0.454	0.355

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

Table 15 shows that the mean (median) EBITDA of parent firms declines from 592.68 (6.29) million Euros in year -1 to 283.76 (2.64) million Euros in year 0. In the subsequent year parents increase their EBITDA to 369.348 (3.583) million Euros. Nevertheless, in the three-year period they document negative, not significant, abnormal changes of -223.33 (-2.710) million Euros.

The following table documents the changes of asset growth for the investigated period. The negative mean abnormal change from year -1 of 21.07% to year 0 of 4.77% is evident in respect to the equity carve-out. This abnormal change is statistically significant on confidence level of 95%. In the year after the transaction parent increase their asset growth rate to 12.53%.

Table 15: Asset growth

Asset growth	-1	0	1
Mean (in %)	21.068	4.765	12.530
Median (in %)	0.216	7.672	3.620
Observation	52	55	46

Asset growth	(-1, 0)	(0, 1)	(-1 +1)
Mean differences (in %)	-16.303**	7.765	-8.538
p- value	0.040	0.212	0.323
Median differences (in %)	7.456	-4.053	3.404
Wilcoxon p-value	0.077	0.147	0.601

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

In the context of the fund raising hypothesis as main motive for conducting carve-out, Table 16 present the abnormal changes of leverage for the parent firm over the three-years period. According to the outlined results, the financing strategy hypothesis, as defined by Vijh (2002), is supporting evidence in the carve-out sample, although there is no significance found.

Table 16: Total Debt/ Total Assets

TOTAL DEBT/TOTAL ASSETS	-1	0	1
Mean (in %)	168.168	26.076	28.744
Median (in %)	26.100	25.754	25.196
Observation	48	53	45

TOTAL DEBT/TOTAL ASSETS	(-1, 0)	(0, 1)	(-1 +1)
Mean differences (in %)	-142.092	2.668	-139.425
p- value	0.296	0.461	0.345
Median differences (in %)	-0.346	-0.558	-0.904
Wilcoxon p-value	0.841	0.564	0.620

Asterisks indicate significance at the 10% (*), 5% (**) and 1%(***).

The mean (median) total debt to total assets decreases substantially from the year prior to the transaction, 161.17% (26.10%), to the year of transaction, 26.08% (25.75%) supporting that debt decreases considerably. Throughout the entire event period [-1,+1]

parents decreases drastically their leverage, as shown by the negative mean differences (median differences) of -139.43% (-0.90%). This abnormal change symbolizes a source of value creation and supposes, by considering the high total debt to total asset ratio in the year prior the transaction, that fund raising is a key motive for conducting the equity carve-out. According abnormal decrease in the two-year period, (-1,0), it can be explained that the European parent firms used the cash proceeds raised by carve-out transactions to pay down debt. Moreover, the funds raised allow to finance the growth of either firm, reducing the need to assume additional debt which represents the equity carve-out as financing source. Therefore, parents bring efficiencies to their respective balance sheet because of the carve-out.

5.   Conclusion

The purpose of this thesis was to examine the valuation effects occurring by equity carve-outs in Europe. Motivated by the fact that European corporate restructuring referring to equity carve-outs is not broadly investigated, this paper examines the valuation effects of 60 equity carve-outs taking place between 1998 and 2011 in Europe, where the focus of the analysis lies on the parent firms. The most carve-out transactions tool place in the United Kingdom and Germany.

The recent research study demonstrates that parent firms can enhance their value when carving-out units. According to the results of the stock market analysis, the findings found evidence in the short-run as well as in the long-run. Applying the Market Model Parent firms experience a highly significant abnormal return of 1.37% on the day of announcement. Moreover, the valuation effects occurred by the equity carve-out are evident concerning the highly positive CAR(-1,0) and the CAR(-1,+1) (using the Market Model). The findings in the short-run stock market based on the announcement date supports the empirical findings of Langenbach (2001), Gibbs (2000), Klein, Rosenfeld and Beranek (1991), Shipper and Smith (1986), Allen and McConnel (1998), Chemmanur and Paegalis (2000), to name a few. Although, the results obtained by applying the Market Adjusted Model daily are not exactly consistent with the Market Model daily results, by comparing for the same announcement period, models provide similar significantly positive results. In comparison the Market Model shows higher significant CARs, which can be explained by the differences of both models taking in consideration the simplicity of the Market Adjusted Model. However, there is found empirical evidence for the value creation of the carve-out announcement. This value creation can be explained by the sources of value creation outlined by Hennings (1995): the reduced information asymmetries and the optimism separating subsidiary`s business from parent`s activity into two entities that can be valued by the market independently. According to the empirical results, the market revaluation occurs immediately before and after the announcement date. In fact, the announcement of an equity carve-out appears to be received by the market as good news. Moreover, the stock market analysis on the short-run shows that European parent firms fare generally poorly, which let assumes that by focusing on their own business and by reducing information asymmetries parent firms seems to be motivated for selling their wholly owned subsidiary in order to create shareholders value and improve company`s efficiency.

The long-term stock market findings contrast with Vijh (1999), who does not find evidence of the underperformance in the long-run after the carve-out. In contrary, this thesis documents highly significant BHARs on a confidence level of 99% over all investigated event windows. Throughout the first year following the carve-out parent firms earn a significant negative BHAR which assumes that carve-out transaction do not lead to efficiency improvement and do not create value at all. Despite of this, there are results showing a drastically abnormal change of approximately 200% in the following year leading to a significant positive BHAR. The results of the first two investigated event windows support Gleason, Madura and Pennathur (2006) who document a significant strong underperformance for all three periods, specifically in the following 18 months afterwards. In respect to the long-term overperformance in the two-years period, this thesis provides a new empirical finding. Because of the drastically increase from BHAR (+1,+12) to BHAR(+1,+24) it cannot infer that an equity carve-out does not create value.

In the context of long-term operating performance, parent firms increase their profitability over the investigated period. Positive abnormal changes in ROA over the entire three-years event period suppose that parent firms increase their profitability by the IPO of the subsidiary (increase in sale) and by controlling their costs in order not to exceed their revenues. The findings of this paper according the abnormal changes in ROA are not in line with the findings of Michaely and Shaw (1995) examining the long-term operating performance on US-data.

Foremost, the significant abnormal change in median ROE from the year prior and the year after the transaction confirm that parent improve their efficiency in the long-run. This benefit in ROE can be derived by the dividend on sold subsidiary shares in the framework of the subsidiary`s IPO, and/ or from a combination of dividends and reinvestment in the company.

The changes of parent`s leverage, supports that fund raising is an important reason for conducting carve-outs, as it is supported by Allen an McConnel (1998), Vijh (2002) and Frank and Harden (2001). According to the abnormal decrease in the two-year period European parents seem to use the cash proceeds raised by carve-out transactions to pay down debt. This supports the hypothesis that crave-out transactions are used as financial source. The funds raised allow to finance the growth of either firm, reducing

the need to assume additional debt which represents the equity carve-out as financing source. Summing up the findings of the operating performance analysis, carve-out parents are more profitable and more efficient resulting by the carve-out transaction.

Due to the fact that the recent research focus exclusively on the analysis of carve-out parents, there are possibilities to expand the empirical analysis. Future expansion of this paper can include subsidiaries long-term effect analysis as well as the analysis of IPO return in the short-term horizon such as the average first-day return. It will be interesting to see whether parent firms choose to carve-out a unit because the subsidiary results to be more profitable and represent higher growth than the own parents, as shown by the empirical findings of Schipper and Smith (1986), Allen (1998a), Powers (2001) and Frank and Harden (2001).The authors also conclude that equity carve-outs are used as financial source. In the case where European subsidiaries show growth opportunities, one key motive for parents to conduct carve-outs could be to finance the growth opportunities of the subsidiaries, which supports the use of carve-out transactions as financial source. Future expansion of the present research can include a model examining the reduction of information asymmetries between the subsidiary and actors in the capital markets, as applied by Langenbach (2000). Moreover, from particular interest will be a thorough operating analysis for both parties, parent and subsidiary firm, in order to examine the impact of the equity carve-out in the long-term horizon.

Furthermore, it will be interesting to see whether carve-out parents continue in the future to create value in the long-term stock market, taking in consideration that a significant part of the sample contains equity carve-out transaction occurring in 2010 and 2011.

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7.   Appendix

Equity Carveout Flag: Yes/No flag set to 'Y' when the transaction is an Equity Carveout. In an Equity Carveout, the new company´s shares are distributed or sold to the public via an IPO. Equity Carveouts are tracked only if they represent 100% or more of the unit, subsidiary division or other company. However an Equity Carveout of any size is tracked if it is a Privitization. Equity Carveouts are not included in TR?s published M&A Rankings.