FUNDAÇÃO GETÚLIO VARGAS
ESCOLA DE ECONOMIA DE EMPRESAS DE SÃO PAULO

FREDERICO JOSE RODRIGUES DRENKER DOS REIS

DETECTING PATTERNS OF THE SPINOFF DECISION OF COMPANIES AND ACCESSING THE DETERMINATION OF THE ABNORMAL RETURNS

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2014

Reis, Frederico Jose Rodrigues Drenker dos.
Detecting Patterns of the Spinoff Decision of Companies and Accessing the Determination of the Abnormal Returns / Frederico Jose Rodrigues Drenker dos Reis. - 2014.
Number of Pages f. 39

Orientador: Daniel Monte
Dissertação (MPFE) - Escola de Economia de São Paulo.

1. Ações (Finanças). 2. Mercado de ações. 3. Investimentos. 4. Sociedades comerciais, Reorganização. I. Monte, Daniel. II. Dissertação (MPFE) - Escola de Economia de São Paulo. III. Título.

CDU 658.15

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Data de Aprovação:
___/___/____.

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RESUMO

Esta tese examina o valor gerado através de processos de spin-off durante o período compreendido entre 2002 e 2010. Os rácios da Dívida Líquida/Preço Médio das Acções e da Dívida/Activo de uma empresa reflectem impactos estatísticos significativos na decisão deste tipo de processos de reestruturação. Assim sendo, o anúncio e decisão de se proceder a um spin-off contribui para que seja gerado um retorno anormal) (RA) para os accionistas da empresa-mãe. O tamanho relativo do spin-off e a respectiva alavancagem financeira correlacionam-se positivamente com os RA, enquanto, por outro lado, a dívida líquida por acção e a rendibilidade líquida dos activos correlacionam-se negativamente.

Deste modo, não é possível verificar uma transferência de riqueza dos detentores de títulos de dívida de uma empresa para os detentores de capital próprio.

PALAVRAS-CHAVE: *Spinoff, Retorno Anormal, Tranferência de Riqueza, Wealth Transfer, Debt per Share*

ABSTRACT

This paper examines value created through spinoffs over a period from 2002-2010. The net debt to average share price ratio and the debt to asset ratio of a company impacts the decision for this restructuring process statistically significant. The announcement of a spinoff yields abnormal returns (AR) for the stockholders of the parent. The relative size of the spin and the financial leverage correlated with the AR positively, whereas the net debt per share and the return on asset negatively. Therefore, no direct wealth transfer from the debt holders of a company to the equity holders can be derived from these results.

KEY WORDS: *Spinoff, Abnormal Returns, Wealth Transfer, Debt per Share*

I. List of Contents

II. List of Tables

III. List of Figures

1 Introduction

The motivation of this paper arises from the conflict of interests observed between the debt holders and the management of a corporation in the event of major restructuring processes of a firm, like a spinoff. Thus, it investigates if the demerger decision of the spinoff of a subsidiary by a parent is associated with a wealth transfer from the creditors to the equity holders of a company.

The ultimate goal of the management of a company should be to maximize the wealth of its owners and is often not in line with the interests of the creditors of a firm. This phaenomena was described by Jensen and Meckling by the following statement: "[...] *if the owner has the opportunity to first issue debt, then to decide which of the investments to take, and then to sell all or part of his remaining equity claim on the market, he will not be indifferent between the two investments. The reason is that by promising to take the low variance project, selling bonds and then taking the high variance project he can transfer wealth from the (naive) bondholders to himself as equity holder"* (Jensen, M. / Meckling, W., 1976, P. 42).

From the statement above it can be derived, that bondholders are often negatively affected by the decisions of a company to demerger parts of a company, as the whole company can be seen as *"the project"*. Thus, corporate restructuring impacts the bondholders of a company by two issues. First of all, bondholders prefer diversified firms, as they cash flows tend to be more stable compared to undiversified corporations, so the *"low variance project"*. Besides this, also the amount of collaterals for the securitization of their claims shrinks due to the demerger, because a part of the company becomes independent from

the parent. Thus, the risk of a company after a demerger differs from the risk before the event.

The reasons for a demerger decision of a company represents a widely discussed topic in the common literature. Due to this corporate action companies often decrease or even eliminate the negative synergies in the company. In line with this argument also a reduction of the information asymmetry in the firm can be observed (See Burch, T./ Nanda, V., 2003). Moreover, also the momentum effect can increase shareholder wealth significantly. Demerging a subsidiary in an industry with high valuation increases the equity value (See Chavez et al., 2000). In line with this argument, also the clientele effect has to be mentioned. The separation of the parent into two separate listed entities allows to target different preferences of investors. For example the parent could be characterized as a high dividend yield company, whereas the spinoff company targets investors preferring capital gains (See Lizenberger, R./ Sosin, H., (1977). Furthermore, also the management increases its focuses on the core business of the firm by demerging a not substantial subsidiary of the corporation and involving in pure plays (See Comment, R./ Jarell, G. 1995). Last but not least, improving tax efficiency and less regulatory constraints are also seen as an incentive for this corporate action (See Schipper, K./ Smith, A., 1983). Thus, this action often improves the financial results of the company and its announcement leads most of the time to abnormal returns (AR) for the shareholder.

The corporate restructuring ownership relationship actions can be divided into three broad categories, the equity carve out, the spinoff and the split-up. Whereas, the first one represents an own category, the last one is often only a special form of a spinoff. An equity carve out is defined as the initial public offering of a minority interest of a subsidiary of a firm. Thus, the parent company receives cash from this restructuring

action. In contrast to this, the spinoff of a company is characterized by a special stock dividend on a pro rata basis for the shareholders of the parent company. This stock dividend consists of shares of the subsidiary. The main advantage of a spinoff compared to the equity carve out is, that the capital gains from this event occur on a tax-free basis. Thus, these gains become only taxable for the shareholders at the day of the sale of the shares. Moreover, these two forms differ also in one very important fact. As the shares of a spinoff are distributed among the "old owners" of a company no change of control occurs, whereas in the case of an equity carve out the new shares are offered to the public (See Weston, F., 1997). Therefore, the concentration on the restructuring in form of a spinoff is chosen, as it is not associated with effects linked to a change of control on the ownership side. Moreover, the regional concentration of this study is located in the United States of America and period investigated ranges from 01.01.2002 until 31.12.2010.

This study examines the patterns of a spinoff decision by a company and also accesses determinants of the AR around the announcement date of the event by investigating different financial ratios. Moreover, it investigates if a wealth transfer from the debt holders of a company can be associated with the event of spinoff. Thus, it closes a gap between the relationship of the AR around the events and some financial ratios. The rest of this paper is organized in six parts. The next part gives a brief overview over the literature. In section three the datasets of this study were determined, in part four patterns for the decision are represented, whereas in part five the abnormal returns are described. Part six compares these AR with these ratios and investigates the source of them and the last part gives a brief conclusion about the findings.

2 Literature Review

The phaenomena of the abnormal returns of the parent company due to a spinoff announcement represents a widely discussed topic in the common literature. Schipper and Smith (1983) documented the positive reaction of the share price around the announcement by the study of 93 voluntary spinoff announcement. In their research they detected relaxed tax or regulatory constraints as one source of the AR. In the same year Hite and Owers (1983) published a study about the statistically significant positive relation between the relative size of the spunoff subsidiary and the parent company and the AR. Besides this results, both of the researches failed to proof a wealth transfer between the bondholders and the equity holders of a company.

Cusatis et al. (1993) investigated the long-term performance stock market of the parent company and the spinoff by creating a market-weighted portfolio of these up to three years after the completion. Their findings suggest that the abnormal returns of these stocks over the observation window are limited to corporations involved in a takeover activity. Thus, they conclude spinning out a company is an alternative method to *"transfer control of corporate assets to bidders who will generate value"* (See Cusatis et al., 1993, Page 1). This findings about the excess return of the portfolio were later criticized by Mc Connell et al. (2001) for the selection of the holding period of Cusatis et al. and showed evidence that the study was biased.[1]

Focusing on the costs of information asymmetry perceived by investors about the profitability and operating efficiency of a company Krishnawasmi, S./ Subrumamiam, V.

[1] Connell et al. made critical remarks about the fact that the excess return for the portfolio strongly depended on the holding period and the trading strategy. The interest reader is referred to Connel et al. (2001)

(1999) proofed that enhancing the pure plays of a company by spinning of a company reduces or even removes this asymmetry. Moreover, companies associated with high information asymmetry costs are more likely to be involved in this corporate restructuring action.

In contrast to this study, Burch, T./ Nanda, V. (2003) access the cost of information asymmetry on the decision level of a firm. According to their findings, the lower valuation of the combined firm can be explained by the diversified characteristic of the company before the event. Reducing or even eliminating these negative synergies, increases the value of the virtually combined firm after the event. In line with this argument – that the two separate firms are more valuable – John, T. (1993) focussed on the debt side of the capital structure. She recommends in her theoretical paper about the optimal allocation of debt between the parent and the spinoff company, that the more profitable company should take the larger portion of debt. This increases the tax shield, decreases the costs of debt and the agency costs of underinvestment for the joint firm and thus improves the value of the joint firm.

The capital structure of the spinoff and the parent company after the event was also investigated by Mehrotra, V. et al. (2003) on a study of 98 voluntary spinoffs. Their empirical results confirm the theoretical model of John, T. (1993). The leverage between the parent and the spinoff depends positively on their profitability, the fixed asset ratio and negatively on the variance of the returns of their industries.

In addition to this literature also many empirical studies about the conflict of interest between the bondholder and equity regarding the event of the organizational restructuring due to a demerger event like a spinoff was developed. The paper developed by Parino, R.

(1997) proofed a wealth transfer from bondholders to the shareholders of a company in the case of the spinoff of the Marriott Corporation into Marriott International and Marriott Host. Around the announcement window bondholders of the firm suffered losses of over US-$ 190 Million, whereas the stockholders gained US-$ 80.6 Million.[2] The first study confirming this often discussed issue in general is the paper written by Maxwell, W./ Rao, R. (2003). In their analysis of 80 spinoff events they found statistically significance evidence of the negative correlation of the negative AR of bondholders and the positive AR of the shareholders. Thus, the former group on investors is affected by losses of 88 basis points, whereas the latter one benefits from AR of 3.6% around the announcement day. In contrast to these results a latter study of the correlation of the AR of the holders of straight bonds and the shareholders around the event window detected positive AR for both groups of investors (See Veld, C./ Veld-Merkoulova, Y., 2008).

3 Determination of the Dataset

The Dataset was obtained via Bloomberg's Mergers and Acquisition search for Spinoffs. Bloomberg defines Spinoffs as "*The creation of an independent company through the sale or distribution of new shares of an existing business/division of a parent company."*[3](Bloomberg L.P. 2014) The period investigated ranges from the 01.01.2002 until the 31.12.2010 either for the completion date (Dataset A) or for the announcement

[2] The differences between these two values was caused due to the transaction costs and inefficiencies linked to this event.

[3] To control for the condition of no change of ownership the acquirer of the new company is defined by Bloomberg as the Stockholder. The condition of no sale was checked by the deal terms.

date (Dataset B). Both datasets are further geographically restricted to Spinoffs in the United States of America and only completed spinoffs were considered.

For Dataset A the following restrictions were set:

a) Availability of financial data of the parent up to three years before the spinoff completion and two years after the spinoff for the parent and the spunoff company.[4]
b) Parent companies belonging to the financial sector by the Bloomberg Industry Classification System Standards (BICS) were eliminated, because of the coinciding event of the financial crisis during the observation period, new statutory regulations and their differences from other sectors in the capital structure and ratio analysis.[5]
c) Parent companies involved in bankruptcy within 12 months before or after the spinoff were eliminated, as they were not seen as voluntary spinoffs.

This reduced the initial sample of 520 completed spinoffs in the period of investigation to 35 spinoff events of 32 parent companies.

The initial number of firms of Dataset B consisted of 561 spinoffs. The following restriction were set by the author:

a) Spinoffs with no availability of financial data for the financial year before the event or no Ticker for the spinoff company were eliminated.

[4] The availability of Data is restricted to the financial ratios defined in the Apendix
[5] The BICS is divided into 14 different industry sector classifications on a five digit code system. Companies belonging to the classification Funds (10009), Asset-Backed Securities (10001) and Financial (10008) were eliminated.

b) Parent companies with less than US-$ 100 Mio. total balance sheet assets were eliminated, to ensure the liquidity of the stock.
c) Parent companies with no trading data for up to three days 400 days before and 30 days after the event were eliminated
d) Parent companies involved in other Merger and Acquisition deals between the announcement and the completion of the spinoff were eliminated, because of the influence of these events on the stock price.
e) Spinoff companies that were listed before the announcement were eliminated, as only first time trading spinoff companies were respected in this study.

Moreover, also the above described filters b and c of Dataset A were applied. These filters reduced the initial sample of 561 spinoffs to 63 events that were further analysed in chapter 6.

4 Comparison of Companies involved in a Spinoff Event against a Peer Group

To argue in favour of a wealth transfer from the debt holders to the equity holders of a company the influence of different continuous predictor variables on the outcome of doing a spinoff or not were tested. As the event of a spinoff often leads to a reallocation of assets and cash flows (See John, T. 1993) and these are main contributors to the value of the debt an impact of debt ratios should be observable.

4.1 Methodology

For the comparison of the behaviour of companies involved in a spinoff or not for each firm of Dataset A a peer was determined. The group of peers was built on numerous relationships such as analyst coverage, correlated news stories and industrial classification in accordance with the definition of peer groups by Bloomberg (See Bloomberg L. P. 2014). Furthermore, to improve the comparability of the firm and its peers, each of them consisted out of a group up to five companies. The financial ratios for each of them were weighted by the total historical market cap of each peer group.

Moreover, as this part of the paper investigates the determination process for a company in its decision of spinning out a subsidiary or not on the basis of financial ratios the logistical model is used. This model is chosen by following arguments: Firstly, the logistical model allows to set up a model for the binary qualitative variable "spinning company or "not-spinning company" by quantifying them as 1 for the former and as 0 for the latter. Moreover, the density function of the logistic model controls better than the alternative Probit Model for the marginal effects around the mean and the tails of the distribution, which is desirable because of the comparison of companies of different industries and sectors in this section (See Heij, C. 2004).

The logistic regression model can be explained by the following equation (1)

$$P_i = \frac{1}{1 + exp[-(\beta_1 + \beta_2 X_{2i} + \varepsilon_i]} \qquad (1)$$

for every i this function is bounded by P_i to be located between 0 and 1, as $\beta_2 > 0$ and when $X_{2i} \to \infty$, $P_i \to 1$, and when $X_{2i} \to -\infty$, $P_i \to 0$. As this paper investigates the

influence of various variables on the behaviour of a spinning company in equation (1) more variables will be included (i.e. $\beta_2 X_{2i} + \beta_3 X_{3i} + \cdots + \beta_k X_{ki}$). Therefore the formula used to explain the differences in spinning off and not-spinning off companies can be explained by equation (2).

$$\ln \frac{P_i}{(1 - P_i)} = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \cdots + \beta_k X_{ki} + \varepsilon_i \qquad (1)$$

The term in the brackets delivers the odds ratio and determines the probability of outcome based on the predictors (See Thomas, R. 1997). In this specific case being involved in a spinoff or not, coded as 1 or 0.

The following four ratios were tested: *TOT_DEBT_TO_TOT_ASSET"*, *"BS_TOT_ASSET"* and *"RATIO NET DEBT*" and "RETURN_ON_ASSET*"*. These indicators were chosen for the following reason: Firstly the total debt to total asset ratio of a delivers the leverage factor of the balance sheet of a company. As assets were seen as collaterals for debt holders, they impact the value of the debt of a company (See John, T., 1993). Moreover, the second ratio gives a strong indicator about the relative size of the company and controls for the size effect investigated by Hite and Owers (1983). Because there is a strong heterogeneity of the firm size observable, due to different industries and other factors this ratio was calculated on a logarithm basis and is represented by the variable "*Log_asset"*. The ratio "Ratio Net Debt" represents a symbiosis of a balance sheet number (the net debt) against a market ratio (average share price). The idea for the inclusion of this ratio comes from the paper developed by Robert Merton on the pricing of corporate debt. In this paper he emphasizes that the pricing of corporate debt depends besides the variables risk free interest and covenants, also on the

probability of default of a company (See Merton, R. 1974). As debt holders are ranked before equity holders in the case of a corporate default, a high "Ratio Net Debt" increases their risk of not full repayment on their claims in case of bankruptcy of a company.[6] Finally, the last ratio gives a good indicator about the performance of the company. Thus, this ratio indicates the impact of the profitability of a company on the spinoff decision.

4.2 Empirical Findings

In the following table (1) an overview over the results of the logistic regression for the binary outcome variable *"dummyspin"* against the continuous predictor variables *"TOT_DEBT_TO_TOT_ASSET"*, *"BS_TOT_ASSET"* and *"RATIO NET DEBT*" and "RETURN_ON_ASSET*"* is given:[7]

Table 1: Spinoff Patterns according to financial ratios before the event

Panel A: Logistic Regression for the Parent and Peers before the Spinoff

	Number of obs	=	190
	LR chi2(4)	=	9.41
	Prob. > chi2	=	0.0517
Log likelihood = -126.99453	Pseudo R2	=	0.0357

dummyspin	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
TOT_DEBT_TO_TOT-_ASSET	.9728561**	.0125235	-2.14	0.033	.9486175	0.997714
Log_asset	.750541	1.039981	-0.94	0.346	.5463628	5.608717
RATIO_NET_DEBT	1.007285**	.0033059	2.21	0.027	1.000826	1.000826
RETURN_ON_ASSET	.9835044	.0231297	-0.71	0.479	.9392	1.029899
_cons	.9315945	.6606592	-0.10	0.920	.2320491	3.740019

Panel B: Overview over the distribution of the ratios before the Spinoff

	Parent		Peer	
	MEAN	STD	MEAN	STD
TOT_DEBT_TO_TOT-_ASSET	25,655	17,47165	27,05402	14,44739
BS_TOT_ASSET	25605	45748	34580	45824
RATIO_NET_DEBT	79,85563	355,4414	32,83353	38,36121
RETURN_ON_ASSET	4,151114	8,17722	5,040145	4,758238

[6] In the Appendix figure 1 represents a graphical representation of the value of debt and equity

[7] The interest reader is referred to table 4 in the Appendix of this paper, where an overview of the exact calculation of the ratios is given.

Panel A of Table 1 represents the results of the logistic regression of the ratio variables "TOT_DEBT_TO_TOT_ASSET","BS_TOT_ASSET","RATIO NET DEBT" and "RETURN_ON_ASSET" against the binary outcome variable "dummyspin". The low Pseudo R2 was accepted because of the small sample size. Therefore, to assure the explanatory power of the model a linktest can be found in the Appendix under section WY. Asterisks show significance at a value of 1% (***), 5%(**), 10%(*). Panel B represents the mean and standard deviation (STD) of the spinning company ("Parent") and its Peer companies for the period three financial years before the spinoff event. All variables except BS_TOT_ASSET, which is in Million US-$ denoted, are in percentage.

Table 2 indicates at a 5% significance level that the event of a spinoff is negatively correlated to its debt to asset ratio of the balance sheet. Therefore, the odds of doing a spinoff decreases by almost 3% for each unit of increase of the percentage in leverage. This fact is also confirmed by the higher mean of the leverage of the peer companies compared to the companies involved in a spinoff. These results can be explained by covenants by the creditors to protect against unforeseeable trigger events like spinoffs (See Crabbe, L. 1991). So it cannot be concluded from this balance sheet ratio that companies with a high leverage factor are more probably involved in a demerger decision like a spinoff. Thus, this ratio does not indicate any wealth transfer from the "naive" debt holders to equity holders of a company.

Although, the results of panel A indicate, that firms with a larger balance sheet sum are less likely to be involved in a spinoff, this ratio fails to show significance. This result can be explained by the determination of the peers. As one of the conditions of them is to deliver financial data for an uninterrupted period of five years, the peer companies mainly consisted of very large companies. The same is true for the test of the "RETURN _ON_ASSET" ratio in the regression of Panel A. The odds ratio of less than 1 gives not more than a signal for the negative correlation between a spinoff decision and this profitability ratio. Thus, this result would be in line with various earlier researches about the impact of lower performance on the spinoff decision (See Burch, T./ Nanda, V. 2003),

but as it fails to show significance this cannot be conclude at a statistically significant level.

On the other side the net debt to average share price ratio is significant at a 5 per cent level. This outcome lead conclude that companies with a higher proportion of net debt on its market capitalization are more in favour of doing a spinoff. For each increase of 10 units in this ratio the odds of being involved in a spinoff event increase by around 1.07.[8] Putting this result in connection to the previous described pricing model of Robert Merton this clearly indicates that companies faced with higher costs for the issue of new debt are more likely to be involved in a spinoff event. Moreover, this result can be seen as a clear indicator for raising agency costs of the company, as a company with high debt costs faces the problem of underinvestment (See John, T., 1993). In addition this result is in line with the pecking order theorem developed by Myers. Moreover, developing this idea further, this result confirms also the pecking order theorem. Spinning out a subsidiary allows a company besides other factors to reengineer its capital structure and to increase cash flows due to efficiency gains. Thus, as a company prefer internal rather than external financing the spinoff decision can be seen as a source for the former one. (See Myers, S. 1983).

To sum up, although some ratios failed to show significance a first picture from the logistic regression of panel A about the differences in the behaviour of spinning and not spinning firms can be drawn. First of all, firms with a higher debt to asset ratio are less likely to be involved in a spinoff event. In contrast to this finding, the odds for companies with a higher net debt to average share price ratio are positively correlated.

[8] Instead of describing the changes in odds by the scale of 1 unit a larger scale of 10 units was used due to its higher mean and larger standard deviation.

Although, the logistical analysis of the parent, the spinoff and its peer companies show significance results, these are not further discussed in this section, as the explanatory power of the model indicates misspecifications of the model based only on the four variables of panel A. Thus, no conclusions about the behaviour of the companies after the spinoff and its Peer group can be derived on this ratios.[9] Therefore, an overview over the financial ratios of the mean and the standard deviation for the Parent, the Spinoff and their Peers is summarized in panel A and B of table 2.

Table 2: Spinoff Patterns according to financial ratios after the event

Panel A: Overview over the distribution of the ratios after the event for the parent and its peers

	Parent		Peer	
	MEAN	STD	MEAN	STD
TOT_DEBT_TO_TOT-_ASSET	24,60071	20,44068	27,6802	14,787
BS_TOT_ASSET	19067	412345	41538	48082
RATIO_NET_DEBT	33,42935	78,2125	37,34732	42,17042
RETURN_ON_ASSET	4,403419	7,982456	5,35355	4,746149

Panel B: Overview over the distribution of the ratios after the Spinoff for the spinoff and its peers

	Spinoff		PEER	
	MEAN	STD	MEAN	STD
TOT_DEBT_TO_TOT_ASSET	22,09874	78,33574	24,17092	12,9974
BS_TOT_ASSET	11956	34516	153391	652389
RATIO_NET_DEBT	19,61004	78,33574	20,4006	35,55785
RETURN_ON_ASSET	2,526557	16,70304	5,347497	5,708019

Panel B represents the mean and standard deviation (STD) of the spinning company ("Parent") and its Peer companies for the period three financial years after the spinoff event. All variables except BS_TOT_ASSET, which is in Million US-$ denoted, are in percentage.

From table 2 we can conclude, that the financial ratios of the peer groups, the parent and the spinoff are approximating. Especially, for the net debt to asset ratio this results stands in clear contrast to the results of table 1. Although, the average return on asset improved it is still lower than the one from the peer group. This can be explained by the following

[9] The interested reader is referred to the Appendix to table 2 where the results of this regression and a linktest are presented

argument. The improvements of a spinoff significantly depend on the diversity of the company after it and the industries (See Burch, T./ Nanda, V. 2003). An indicator for this phaenomena is the higher standard deviation of this ratio for the parent and the spinoff company compared to their peer groups.

This leads us to conclude the following. The pattern for a spinoff in respect to its financial ratios concerning the debt side of a company is positively determined by its net debt to average share price and negatively to its debt to asset ratio. Thus, companies facing higher costs of debts due to its higher portion of debt of its market capitalization are more likely to be involved in a spinoff. This observation disappears over the next two year period of a company after the event. Therefore, no direct wealth transfer between the debt holders and equity holders can be observed, but the significance of the net debt to average share price ratio in favour of the spinoff decision of a company can be seen as a signal in this direction. To investigate this issuer more precisely the following parts of the paper examines the observation of abnormal returns of the parent company around the announcement date of the spinoff decision and links them directly to financial ratios.

5 Determination and Findings on the Investigation of Cumulative Abnormal Returns

This part of the thesis examines the effects of the spinoff announcement on the parent's stock price for an event window of 61 days, starting 30 days before the event and finishing 30 days after it. Compared to other studies on the effects of spinoffs on the share price (See Miles, J./ Rosenfeld, J. 1983) of the parent company around the event date a much shorter window was chosen, because of the following reason. In Part six of this paper different financial analysis ratios and their impact on the evolution of the stock price

caused by the spinoff announcement were tested. As these were seen as static variables the short event window will reduce the effect of the financial reengineering and other changes in the corporate structure of the company caused after the event. Therefore, the idea of the efficient market hypothesis that prices react to news builds the basis of this event study (See Fama, E., 1970).

5.1 Methodology

To estimate the abnormal returns of the parent company an estimation window of 400 days until 31 days before the announcement was chosen. Abnormal returns were defined by the following equation (2):

$$AR_t = \frac{1}{N}\sum_{i=1}^{N}(R_{it} - \hat{\alpha} - \hat{\beta}R_{mt}) \qquad (2)$$

The term AR_t represents the abnormal return at the event window t, N the number of stocks, R_{it} the return of the stock for a certain period at time t, $\hat{\alpha}_i$ the intercept of the stock, $\hat{\beta}_i$ the systematic risk of the stock.

The return of the market model is calculated from the S & P over the investigation period by the ordinary least squared method. The selection of this index can be argued by the following. As this sample only consist of spinoffs in the U.S. it represents a good geographical fit. Moreover, the liquidity of the stocks of the sample should be comparable with the stocks of the S &P 500, as only companies with more than 100 Million US-$ total assets were included in the sample. As well as the daily returns of the parent as the returns of the market index were calculated on a logarithm basis.

Last but not least the cumulative abnormal returns (CAR) for different time periods t in the event window were determined by the following equation (3):

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t=t_2} AR_{it} \qquad (3)$$

AR_t is defined as in equation (1), which begins at t = t_1 and ends at t= t_2 for a stock i. The individual CAR_i represents the sum of AR_{it} over this period.

The underlying sample for the investigation of the abnormal returns of the parent companies around the announcement date of the spinoff is represented by the earlier described dataset B. To determine the exact date of the announcement of the spinoff by the parent company the Bloomberg data search for spinoffs was used. Moreover, to eliminate the effect of other news, which could have influenced the stock price of the parent company around the event date, a search for earning warnings and/or extraordinary cash dividends was done with the result of no coinciding events for the 63 parent companies in the event window. Furthermore, this paper assumes that there were no further company events impacting the price of the stock around the announcement date unless earning warnings and the in chapter three defined merger and acquisition news of the 63 companies. The alternative hypothesis tested in this chapter of the paper is the following:

"The stocks of the parent companies will yield abnormal returns caused by the spinoff announcement".

5.2 Description of the Dataset

According to the BICS standards 59 of the 63 parent spinoff companies could be classified into seven different industries before the event and only for four of them no classification was available. An overview over the sample and its BICS are given in the following table 3.

Table 3: Industrial Classification of the Parent Companies according to the BICS

Sector	BICS	Number of Companies
Communications	10003	12
Consumer, Cyclical	10004	1
Consumer, Non-Cyclical	10005	20
Energy	10007	7
Industrial	10011	8
Technology	10013	8
Utilities	10014	3
N.A.	-/-	4
Total		**63**

From table 3 we can clearly derive that the Non-Cyclical Consumer Sector was the dominating factor regarding the number of Spinoffs over the observation period and is an indicator for a consolidation of this sector during the observation period (See Mulherin, H. /Boone, A. 2000). In contrast to the sector specific distribution of the spinoffs as depicted in Table 3 there could be no concentration in certain years been observed.

Table 4: Overview over the annual distribution of the spinoffs

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	**Total**
Number of Spinoffs	7	10	8	11	3	12	3	5	4	**63**

The size of the balance sheet sum of the spinning of company of the year before the event varied between US-$ 106,198 Million up to US-$ 114 Billion with an average of US-$

15 Billion. The value of the spinoff company ranged between US-$ 12.584 Million up to US-$ 10.67 Billion.[10]

Furthermore, as spinoffs are often associated with complicated legal processes the time between the announcement and the completion of the spinoff company differed between 9 and 581 days with an average of 156 days for the sample. To reduce the effect of these large fluctuations and other side effects in this period (i. e. other ad-hoc news influencing the price) the short event window only around the announcement day was selected, as explained earlier.

5.3 Empirical Findings

Panel A of Table 5 shows the daily abnormal returns of the parent company of Dataset B around the announcement date for a period of 61 days starting 30 days before and finishing 30 days after the event, whereas Panel B indicates the cumulative abnormal returns for selected 30 days and 5 days window in the event window. Moreover, for the visualization of the cumulative abnormal returns figure 1 is included.

Table 5: AR and CAR of the parent company due to the announcement

Panel A: Event Day	**AR**	**t-statistic**	**Number of positive AR**	**Minimum**	**Maximum**	**STD**
-30	-0,002	-0,5791	28	-0,0492	0,0624	0,0198
-29	-0,0012	-0,3452	27	-0,0643	0,0537	0,0225
-28	0,0036	1,0434	36	-0,0316	0,0583	0,0196
-27	-0,0008	-0,2404	26	-0,0351	0,0796	0,0233
-26	-0,0001	-0,0257	31	-0,0377	0,0562	0,0200
-25	-0,0007	-0,1961	29	-0,0436	0,0811	0,0224
-24	-0,0013	-0,384	30	-0,0508	0,0285	0,0172
-23	0,0009	0,2684	33	-0,0342	0,0441	0,0198
-22	0,0047	1,3829	40	-0,0861	0,0511	0,0243

[10] These values may differ from Bloomberg, as there also the average prices for the first 20 days of trading were taken into account. The exact calculation for the spinoff and the parent company can be found in section 6 under methodology

-21	-0,0007	-0,2189	38	-0,1851	0,0521	0,0422
-20	-0,0029	-0,8436	25	-0,0365	0,0469	0,0174
-19	0,0026	0,7493	27	-0,0726	0,1662	0,0372
-18	-0,0055	-1,6027	20	-0,1410	0,0793	0,0366
-17	0,0036	1,0579	37	-0,0564	0,0901	0,0243
-16	0,0032	0,9228	34	-0,1437	0,1903	0,0450
-15	0,0043	1,2499	38	-0,0984	0,0750	0,0284
-14	-0,0009	-0,2573	24	-0,0467	0,0799	0,0223
-13	0,0015	0,4443	34	-0,0392	0,0625	0,0213
-12	0,0082	2,3838**	38	-0,0388	0,3171	0,0573
-11	-0,0015	-0,4328	30	-0,0553	0,0428	0,0207
-10	-0,0008	-0,2322	24	-0,0971	0,0631	0,0254
-9	-0,0026	-0,7651	25	-0,0464	0,0434	0,0178
-8	0,0036	1,0402	35	-0,0431	0,0835	0,0217
-7	0,0011	0,3095	27	-0,0244	0,0518	0,0158
-6	0,0007	0,2045	28	-0,0448	0,0743	0,0219
-5	0,0007	0,2092	25	-0,0218	0,0568	0,0165
-4	0,0035	1,0086	34	-0,0310	0,0507	0,0178
-3	0,0001	0,0401	31	-0,1337	0,0466	0,0281
-2	0,0056	1,6424	31	-0,0241	0,1214	0,0274
-1	0,0001	0,0358	31	-0,0798	0,0682	0,0257
0	0,0186	5,444***	42	-0,0854	0,2196	0,0538
1	0,0021	0,6177	24	-0,0990	0,4535	0,0860
2	-0,0048	-1,4084	22	-0,1179	0,0575	0,0264
3	0,0018	0,5369	26	-0,0485	0,1851	0,0393
4	-0,0039	-1,1367	26	-0,0947	0,0428	0,0269
5	0,0064	1,8737**	33	-0,0302	0,0800	0,0243
6	0,0091	2,6636***	41	-0,0272	0,1568	0,0321
7	0,0028	0,8105	33	-0,0724	0,0593	0,0250
8	0,001	0,2789	31	-0,0513	0,0404	0,0190
9	-0,0013	-0,3712	25	-0,0730	0,0891	0,0240
10	-0,0027	-0,7748	26	-0,0947	0,0521	0,0251
11	-0,0041	-1,1948	26	-0,1293	0,0507	0,0301
12	0,0027	0,8009	40	-0,1615	0,0567	0,0325
13	-0,0024	-0,7054	29	-0,1052	0,0503	0,0252
14	-0,0001	-0,0272	29	-0,1006	0,0474	0,0230
15	0,0016	0,4681	32	-0,0618	0,0848	0,0254
16	-0,0011	-0,3144	28	-0,0731	0,0392	0,0231
17	0,0002	0,063	29	-0,0265	0,0889	0,0218
18	-0,0035	-1,0344	27	-0,1427	0,0256	0,0294
19	-0,0013	-0,3749	31	-0,0451	0,0938	0,0251
20	0,0021	0,6122	37	-0,0815	0,0885	0,0281
21	0,001	0,287	29	-0,0596	0,1121	0,0318
22	0,0001	0,0392	30	-0,0740	0,0788	0,0254
23	-0,0024	-0,714	29	-0,0815	0,0398	0,0198
24	0,0021	0,6034	37	-0,0989	0,0516	0,0261
25	0,0024	0,7027	27	-0,0265	0,1758	0,0330

26	-0,0031	-0,9195	24	-0,0902	0,0730	0,0257
27	0,0047	1,3867	33	-0,0655	0,0808	0,0251
28	0,0009	0,2576	29	-0,0963	0,0672	0,0284
29	0,0032	0,9287	34	-0,1216	0,1581	0,0377
30	-0,0008	-0,2454	28	-0,0885	0,0725	0,0233

Panel B: Overview of the CAR for different Windows

Window	CAR	t-statistic	Number of positive CAR	Minimum	Maximum	STD
(-30...0)	0,0456	2,3912**	39	-0,2423	0,4507	0,1298
(0...30)	0,0313	1,6441	34	-0,2912	0,4246	0,1604
(-30…30)	0,0583	2,1796**	33	-0,3807	0,6988	0,2162
(-30...-25)	-0,0012	-0,1401	26	-0,1268	0,2722	0,0550
(-25...-20)	0,001	0,0035	31	-0,1417	0,1206	0,0399
(-20...-15)	0,0053	0,6261	36	-0,1108	0,1928	0,0486
(-15...-10)	0,0108	1,2883	35	-0,1292	0,3049	0,0622
(-10...-5)	0,0026	0,3128	31	-0,1095	0,1561	0,0414
(-5...0)	0,0287	3,4212***	41	-0,1468	0,2190	0,0635
(0...5)	0,0203	2,4197**	34	-0,1642	0,4151	0,0977
(5...10)	0,0153	1,8292*	32	-0,0758	0,1882	0,0511
(10...15)	-0,0049	-0,5851	29	-0,1500	0,1080	0,0534
(15...20)	-0,002	-0,2369	29	-0,1325	0,1397	0,0451
(20...25)	0,0052	0,6248	31	-0,1143	0,1419	0,0476
(25...30)	0,0072	0,8618	30	-0,1185	0,2515	0,0549

*Panel A and B represent the abnormal returns ranging from daily Panel (A) up to 30 days (Panel B) of the 63 parent companies of Dataset B over the estimation period of -30 days until +30 days of the announcement of the spinoff by the parent.. Moreover also the significance is indicated by the parametic t-statistic. The significance level is indicated by Asterisks, * indicates significance at a 10% level, ** at a 5% level and *** at a 1 per cent level*

Figure 1: Cumulative abnormal returns of the event window -30 until 30 days

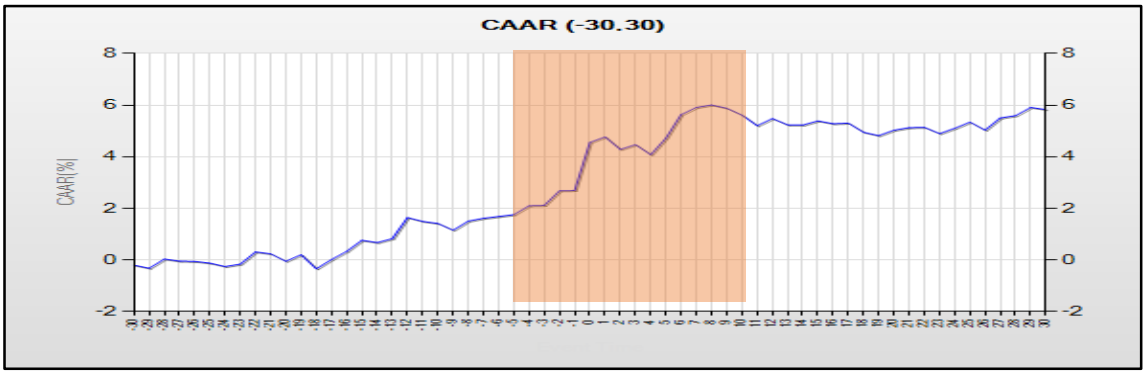

Figure 1 represents the cumulative abnormal returns for the event window. For a better visibility the window – 5 days until 10 days after the event are marked in orange.

The analysis of the abnormal returns shows an overall positive trend of the abnormal returns over the whole observation period. The CAR over the whole investigation period yields statistically significant at a 5 per cent level CAR of 5.83 per cent, which are

especially enhanced from 5 days prior of the announcement until 8 days after it. Moreover, in the 17 days window ranging from day -8 until 8 only on two days, namely day two and four, negative abnormal returns could be observed. But these with no statistical significance. Besides this fact also three of the four statistically significant daily returns occurred during this period. As we can see in Panel A and figure 1 the abnormal returns peaked on the day of the announcement at 1.86% at a significance level of 1%, resulting in positive abnormal returns for 42 of the 63 companies of the investigated sample. Moreover, also the standard deviation of the abnormal returns reached its two maxima on this day and the following day, implicating that there was no homogenous reaction on the stock price for all companies on this event. Furthermore, also on day 5 after the event statistically significant abnormal returns at a 5 per cent level of 0.64% can be observed, whereas on day 6 after it abnormal returns at a 0.61% at a 1 per cent significance level. Last but not least, also on day 12 before the event shows statistically significant AR of 0.82% at 1 per cent level occurred.

In Panel B the daily abnormal returns were converted into CAR to investigate the AR over different time periods in the event window. The window starting 30 days before and ending at the day of the announcement results in CAR of 4.56% at a significance level of 5%, whereas the window from day 0 until day 30 results in CAR 3.13%, but failing to show significance. In addition the splitting up of the event window in 12 five day windows tell us a similar story as the investigation of Panel A. The standard deviation of the abnormal returns increases around the event date and the significant CAR also are occurring around this day. Therefore, statistically significant abnormal returns can be observed in the period -5 until 0 of 2.87% at a 1%, from 0 to 5 of 2.03% at a 5% and of 1.53% at a 10% level. Furthermore, the highest number of stocks with positive CAR can

be detected in the window starting 5 days prior and ending at the day of the announcement of the spinoff by the parent company. This result can be seen as a leakage of information, where a small group of investors receive the news before the broad public (See Bodie, Z. et al. 2011). Moreover, the observed statistically significant positive CAR in the investigation period caused by the spinoff announcement stands in line with prior studies (See Miles, 1983, Hite, L. and Owers, J. 1983). Likewise, the highest abnormal returns were observed around the days of the event. Thus, it can be concluded, that the announcement of a demerger – like a spinoff – is associated with a positive impact on the shareholder wealth for the equity owner of a company.

6 Empirical findings for the Determination of the abnormal Returns

To estimate the source of the AR and CAR this part of the paper focusses on the relationship between the financial ratios introduced in chapter 3. Moreover, it testes this model also on its robustness including other variables.

6.1 Methodology

To model the relation between the above examined abnormal returns of the parent company caused by the spinoff announcement and different financial ratios the methodology of a multiple linear regression model based on the ordinary least squared method (OLS) is adopted in this part of the paper. This method is applicable to show the impact of dependent variables on the outcome of an independent variable. The multiple regression model is determined by the following equation (4)

$$E_x(y) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_p x_p \qquad (4)$$

where y represents the respond variable and x_1, x_2.. x_p the independent variables (See Williams 1959, P. 23) . In this study the individual cumulative abnormal returns of the period five days before until eight days after the announcement are defined as the dependent variable y. An overview over CAR of these window is given in the following table 6.

Table 6: CAR for the event window -5 until 8 days

Window	CAR	t-statistic	Number of positive CAR	Minimum	Maximum	STD
-5 until 8	0,0583	2,180 **	39	-0,192	0,5680	0,1222

Asterisks show significance at a value of 1% (***), 5%(**), 10%(*)

The selection of this window can be justified by the following reason. First of all, as this study wants to measure the impact of the last available yearly financial ratio of the parent on its abnormal returns a short window had to be chosen to not distort for additional influential news. Thus a subjective maximum of fourteen days was defined by the author. As during the period between -5 days until 8 days after the event the highest observable statistically CAR occurred the author selected this windows (See Figure 1)

Moreover, also a dummy variable *"SIC Dummy"* was built to control for the fixed effect indicating a difference between the future industry of the spinoff and the actual of the parent company.[11] This is in accordance with earlier developed papers indicating that increasing the industrial focus of companies by spinning out in a different industry than the parent ones are associated with higher abnormal returns around the announcement

[11] The application of the SIC classification system was used, as the BICS is too superficial. According to the BICS only 10 companies changed their industry.

event (See Hemang, D./ Prem, C., 1999). Out of the 63 companies 50 spinoff companies were classified in different industries rather than their parent firms.

To respect the impact of the relative size of the spinoff proofed by Hite and Owers (1983) the variable "Size of the Spin" was created. As the value of the spinoff company was not available for all companies on the Bloomberg Database the author calculated it by the following equation 3

$$Value_{Spin} = S\_Out_{t-1} * E_{Terms} * PX_{Spin\,(t)} \qquad (3)$$

Where S_Out_{t-1} represents the unadjusted shares outstanding of the parent for the fiscal year before the completion date of the spinoff, E_{Terms} the stock exchange terms between the parent and the spinoff and $PX_{Spin\,(t)}$ the closing price of the spinoff on its first day of trading.

In addition to estimate the size of the demerger decision relative to the total size of the company the value of the parent company was similar calculated as in equation 3 by the following formula:

$$Value_{Parent} = S\_Out_{t-1} * PX_{Parent\,(t)} \qquad (5)$$

Where S_Out_{t-1} represents the unadjusted shares outstanding of the parent for the fiscal year before the completion date of the spinoff and $PX_{Spin\,(t)}$ the closing price of the parent company on the first day of trading of its spinoff. The relative size of the demerger is measured in by equation (6) in per cent:

$$Relative\ Size = \frac{Value_{Spin}}{Value_{Parent} + Value_{Spin}} \qquad (6)$$

6.2 Empirical Findings

To assure a comparability of the results of Part XY a linear regression for the response variable "*Return*" against the predictor variables "*TOT_DEBT_TO_TOT _ASSET","RATIO NET DEBT","RETURN_ON_ASSET"* adjusted for the additional variables *"Size of the Spin"* and the dummy variables *"SIC Dummy"* and *"Spinoff Industry"* was tested. This regression failed to fulfil the skewness and kurtosis assumptions of the OLS. Therefore instead, of the OLS method a robust regression method was chosen.

Table 7: Correlation between the Return and different Predictors

Panel A: Results of the Robust Regression

				Number of obs	=	63
				F(5, 57)	=	6.45
				Prob > F	=	0.0022
				R-squared	=	0.3486
				Root MSE	=	10.285
RETURN	Coef.	Std. Err.	t	P>t	[95%Conf.	Interval]
TOT_DEBT_TO_TOT_ ASSET	.0189612	0.073905	0.26	0.798	-.1290313	.1669536
NETDEBTPERSHARE	-0.0220023***	0.006178	-3.56	0.001	-0.0343734	-0.009631
RETURNONASSET	-.406749**	.1816828	-2.24	0.029	-.7705685	-.0429413
SIZEOFTHESPIN	.1314368**	.0638478	2.06	0.044	0.003586	.2592899
SICDUMMY	5.155085	3.30578	1.56	0.124	-1.46463	11.7748
_cons	-1.877942	4.37571	-0.43	0.668	-10.60383	6.847944

Panel B: Overview over the distribution of the Ratios according to the Quartiles of the Return

Variable/ Quartile CAR	< -2,42304	2,98275	7,180863	>7,180
TOT_DEBT_TO_TOT_ ASSET	30,49422	21,74077	27,35639	18,15453
NETDEBTPERSHARE	129,1419	42,70242	53,42211	15,55122
RETURNONASSET	4,439488	0,581485	3,846498	-6,0178
Size of the Spin	19,05583	20,73007	27,41285	31,90912

Panel A represents the results of the robust linear regression using Huber weights of the variables *"TOT_DEBT_TO_TOT _ASSET","RATIO NET DEBT","RETURN_ON_ASSET" , "Size of the Spin"* and the dummy variable *"SIC Dummy"* against the response variable *"Return"*. Asterisks show significance at a value of 1% (***), 5%(**), 10%(*). Panel XCCVB shows the distribution of the average of each ratio according to the quartile of the returns. All values are in per cent.

From the outcomes of Panel A we can derive that almost 35% of the variance of the returns can be explained by the selected four variables.

In more detail, the result of the variable Size of the Spin shows that the relative size of the company does matter and influences the CAR of the parent company statistically significant at a 5 percent level positively by 0.131. This, is also confirmed by the overview given in Panel B, where the average relative size of the companies in the fourth quartile is more than 50% larger than for the first. This result does stand in line with previous studies about the impact of the relative size on the CAR of the stock around the announcement day (See Hite and Owers 1983).

Moreover, also the Return on Asset, indicates at a significance level of 5 per cent that stockholders of a company with a low return ratio are more likely to expect higher CAR than otherwise. This results can be seen as a signal of the expectation of increasing performance due to the demerger of a subsidiary of the company and stands in line with earlier researches (See Hemang, D./ Prem, C., 1999 or Burch, T./ Nanda, V., 2003).

Furthermore, the CAR of this window is at a 1 per cent significance level negatively correlated with the net debt per share. Therefore, each unit increase in the net debt affects the CAR negatively by 0.022. This result is also confirmed by Panel B where the lower quartile of the distribution of the returns shows higher average returns. This finding, stands in contradiction to the outcome of the logistic regression in part 4, namely that the net debt per share affects positively the spinoff decision. Thus, companies basing their decision on this ratio seem to have to accept the following trade-off. As already explained, companies with a high net debt per share ratio are more likely to suffer from high debt financing costs and costs of underinvestment. By spinning out a subsidiary, these

companies can often readjust their capital structure and thus, reducing these costs. On the other side, as Panel A indicates, that the expected CAR shrinks with the increase in the net debt per share. Linking this to the condition of shareholder wealth maximization by the decision takers of a company, managers of a firm do not act in favour by basing their demerger decision only on this ratio. Besides this, as the net debt per share ratio does negatively correlate with the CAR of the investigated period and bearing in mind the debt pricing model developed by Merton (1974) debt holders are likely to be negative affected by this event, especially these investing in firms with a high net debt per share ratio. On the other side, also the equity holders of these companies suffer from lower CAR. Therefore, no direct wealth transfer from the debt holders to the equity holders of a company can be derived from this result, but as the overall CAR is positive for the sample a signal in this direction is given.

Moreover, the debt to asset and the SIC dummy variable failed to show significance. For the latter one, this stands in contradiction to the results developed Burch, T./ Nanda, V. (2003) on the one side, but on the other side this outcome could be caused by different methods of calculation.

Test for Robustness

To test the developed model for its robustness a second regression was designed to detect further ratios that influence the CAR of the investigated period statistically significant. Besides the net debt to average share price ratio, the size of the spin and the SIC dummy, the dummy variable "Spinoff Industry" and the continuous variable "FNCL_LVRG" are included. For the former one, this differentiation is necessary, as the spinoffs of the sample are defined as first trading companies. Thus, their first trading price will also

depend on the market environment of the future target industry (See Chavez et al., 2000). As this study is confronted with a small sample size, this classification was done on the basis of the BICS. An overview over the Spinoff target industries is given in the following table 8.

Table 8: Future Industry of the Spinoff firms according to the BICS

Sector	BICS	Number of Companies
Basic Materials	10002	5
Communications	10003	8
Consumer, Cyclical	10004	5
Consumer, Non-Cyclical	10005	23
Diversified	10006	1
Energy	10007	6
Financial	10008	2
Industrial	10011	7
Technology	10013	5
Utilities	10014	1
Total		**63**

The large cluster of companies located in the BICS sector 1005 is an indicator for a consolidation of that sector during the observation period (See Mulherin, H. /Boone, A. 2000).

The FNCL_LVRG ratio represents the financial leverage of a company. It is calculated by dividing the average assets of a company by its historical market cap of a financial year. Thus, it can be seen as the inverse of the commonly known price to book ratio. Hence, it can be interpreted as the impact of the conglomerate discount on the company valuation. Therefore, companies with a high "FNCL_LVRG" ratio are assumed to benefit more from the spinoff announcement than companies with a low ratio (See Krishnaswami, S./Subramaniam, V. 1999). The following table 9 represents the results of this multiple linear regression.

Table 9: Result of the robustness regression

Panel A: Result of the OLS regression

Source	SS	df	MS			
Model	5613.23411	13	431.787239	Number of obs	=	63
Residual	3360.29322	49	68.5774126	F(13, 49)	=	6.30
Total	8973.52733	62	144.734312	Prob > F	=	0.0000
				R-squared	=	.6255
				Adj R-squared	=	0.5262
				Root MSE	=	8.2811

RETURN	Coef.	Std. Err.	t	P>t	[95%Conf.	Interval]
NETDEBTPERSHARE	-.0138269	.0090151	-1.53	0.132	-.0319433	.0042896
SIZEOFTHESPIN	.0935946*	.0509961	1.84	0.073	-.0088859	.1960751
FNCL_LVRG	.8446827***	.1254539	6.73	.000	0.5925737	1.096792
SICDUMMY	2.695379	2.801434	0.96	0.341	-2.934314	8.325072
t1	-3.706255	9.096614	-0.41	0.685	-21.98659	14.57408
t2	.2792036	8.917191	0.03	0.975	-17.64056	18.19897
t3	-2.043341	9.162545	-0.22	0.824	-20.45616	16.36948
t4	-6.11833	8.529163	-0.72	0.477	-23.25833	11.02166
t5	1.826791	11.75333	0.16	0.877	-21.79241	25.44599
t6	4.745554	9.11963	0.52	0.605	-13.58103	23.07214
t7	-7.382833	10.26515	-0.72	0.475	-28.01142	13.24575
t8	-1.428652	8.969662	-0.16	0.874	-19.45386	16.59656
t9	12.28082	9.229017	1.33	0.189	-6.265585	30.82722
t10	0		(omitted)			
_cons	-1.960962	8.848654	-0.22		-19.743	15.82107

Panel A represents the results of the robust linear regression of the variables *""RATIO NET DEBT", "Leverage"* and, *"Size of the Spin"* and the dummy variables *"SIC Dummy"* and *"Spinoff Industry"* (denoted by t) against the response variable *"Return"*. Asterisks show significance at a value of 1% (***), 5%(**), 10%(*).

The adjusted R^2 of 0.5262 indicates that the multiple linear regression model table 9 explains over 50% of the variance of the response variable Return can be explained by this model. Thus, this model represents a better goodness of fit than the former one.

Although, in this model sign of the coefficient of the net debt per share ratio sill indicates a negative correlation between these ratios, it fails to show significance. The same is true for the dummy variable SIC.

On the other side the size of the spin maintains to be a significant variable and the FNCL_LVRG indicates significance at a 1 per cent level. This independent variable impacts on average the CAR around the defined event window by over 0.8 for each

increase in financial leverage. These results can be explained by the following phenomena. The large regression coefficient is a strong indicator for the theory that two separate firms are more worth than one alone standing entity. The causes for this observation of this are various. For example, large companies are often devalued by a conglomerate discount. This discount represents the costs of non-synergetic effects like information asymmetries observable in these (See Krishnaswami, S./Subramaniam, V. 1999). Moreover, the management of these companies does more often involve in strategies that are not in line with the interests of the shareholders and thus conflicts of interests between arise between these two groups (See Roll, R. 1986). As a demerger like a spinoff stands in clear contradiction to this problem, the announcement of this event by the parent signals the market a good corporate governance. This phaenomena was also confirmed by earlier studies that a good corporate governance does impact positively the equity price of a company (See Gompers et al., 2003).[12]

7 Summary and Conclusion

As the empirical research about the determination of the patterns of companies of a spinoff decision had shown this decision of a company depends statistically significant on its debt to asset and its net debt per average share price ratio. The negative impact of the first ratio does indicate that bondholders or creditors of companies do protect against trigger events like demergers of firms. Moreover, the positive influence on the net debt per average share ratio on the event implies that companies facing high debt costs are more likely to be involved in a spinoff. On the one side, this indicates for the debt holders

[12] Other factors influencing this discount were already mentioned under chapter two of this stuey

of a company a loss of collateral or/and cash flows and thus a devaluation of their debt. But on the other side no disadvantage of the status of the debt holder based on these ratios could be measured over a period two years after the event. On contrary, on a long-term perspective the average net debt per share ratio improved and approximated the ratio of the peer group. Therefore, no negative impact on the creditors and their claims can be derived from this perspective and hence also no wealth transfer from the bondholders to the equity holders of a company.

Furthermore, like earlier researches had shown, this study confirms the abnormal returns for stockholders resulting from the announcement of a spinoff by a company. The investigation of the abnormal returns for 63 companies over an event window of 30 days prior and 30 days after the event resulted in statistically significant cumulative abnormal returns of 5.83 per cent. Moreover, the abnormal returns peaked on the announcement date statistically significant at 1.86 per cent. Thus, spinning out a subsidiary firm does increase the wealth of the shareholders of a company.

As sources of the statistically significant positive abnormal returns of the parents stocks three different sources could be detected in a first regression. First of all, the expectation of improving performance from the return on asset ratio, secondly, a possible wealth transfer from the bondholders to the equity holders and last but not least also the increased focus by the relative size of the company.

The first and the last source of shareholder gains represents the expectations about the decrease of the conglomerate discount of a company after the spinoff of a subsidiary. Therefore, companies with a low performance are considered to have a larger potential for future improvements. This fact, does explain the negative correlation between the

cumulative abnormal returns and this ratios. Moreover, also the size of the spin does give an indicator about the intensification on the focus of a company. Thus, relatively large spinoffs do impact the cumulative abnormal return for the shareholders significant.

The negative correlation between the cumulative abnormal returns and its net debt per average share price ratio delivers a two edged picture. On the one side no direct wealth transfer between the debt holders and the equity holders of a company can be concluded from it, as the overall cumulative abnormal returns are positive. Thus, the average ratio net debt per share decreases due to the spinoff. On the other side, the redistribution of collaterals does affect the creditors of a company negatively. Therefore, for companies with a high net debt to asset ratio this impact should be worse, as their expected cumulative abnormal return is also lower. Hence, a wealth transfer from the debt holders to the equity holders of a company seems to be more likely these companies. These results could also explain the contradictionary results of Maxwell, W./ Rao, R. (2003) and Veld, C./ Veld-Merkoulova, Y. (2008) about a wealth transfer from the bondholders of a company to the equity holders of a company.

In a second regression one additional source for the shareholder gains around the announcement date could be detected, the financial leverage of a company. This result strongly indicates an undervaluation of the aggregated parts of a company. By announcing to demerge a subsidiary the expectation of the improvement of the now less diversified firm is reflected by the strong positive correlation between this ratio and the cumulative abnormal returns.

To sum up, spinning out a company is determined by the debt to asset and the net debt per average share price ratio of a company. The announcement of this event results in

positive abnormal returns for the shareholders of a company. These are statistically significant correlated with the net debt to average share price ratio, the performance, the size of the spin and the financial leverage of a company.

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9 Appendix

Table 1: Linktest for the logistic regression of chapter 4 for table 1

	Number of obs	=	190
	LR chi2(4)	=	11.04
	Prob > chi2	=	0.0040
Log likelihood = -128.44294	Pseudo R2	=	0.0419

dummyspin	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
_hat	.902044	.3872962	2.74	0.006	0.310915	1.873037
_hat_sq	.7733207	.6338696	1.22	0.222	-.469041	2.015682
_cons	-.12429093	.1785886	-0.70	0.487	-.474237	.2258178

Table 1 represents the linktest for the logistic regression of Table 1 in section 4

Table 2: Failed logistic regression of Chapter 4

	Number of obs	=	398
	LR chi2(4)	=	12.65
	Prob > chi2	=	0.0131
Log likelihood = -269.54893	Pseudo R2	=	0.0229

dummyspin	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
TOT_DEBT_TO_TOT-_ASSET	.9873266	.0082894	-1.52	0.129	.9712125	1.003708
Log_Asset	1.166547*	.6133718	1.90	0.058	.9802188	3.554307
RATIO_NET_DEBT	1.001311	.0021872	0.60	0.549	.997033	1.005607
RETURN_ON_ASSET	0.9743403*	.0129874	-1.95	0.051	.949215	1.000131
_cons	0.775469	.3387781	-0.58	0.559	.3286561	1.825382

Table 2 represents the logistic regression for the parent, the spinoff and their peers after the spinoff completion. Asterisks show significance at a value of 1% (***), 5%(**), 10%(*). This regression failed to show explanatory power, as can be derived from table 3.

Table 3: Linktest for Table 2 of the Appendix

	Number of obs	=	398
	LR chi2(4)	=	41.96
	Prob > chi2	=	0.0000
Log likelihood = -128.44294	Pseudo R2	=	0.0760

dummyspin	Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
_hat	1.065986	.4032313	2.64	0.008	0.275667	1.85631
_hat_sq	4.188876	.9717543	4.31	0.000	2.284273	6.09348
_cons	-0.3635004	.1262234	-2.88	0.004	-.610894	-0.11611

Figure 1: Debt as an Option Portfolio

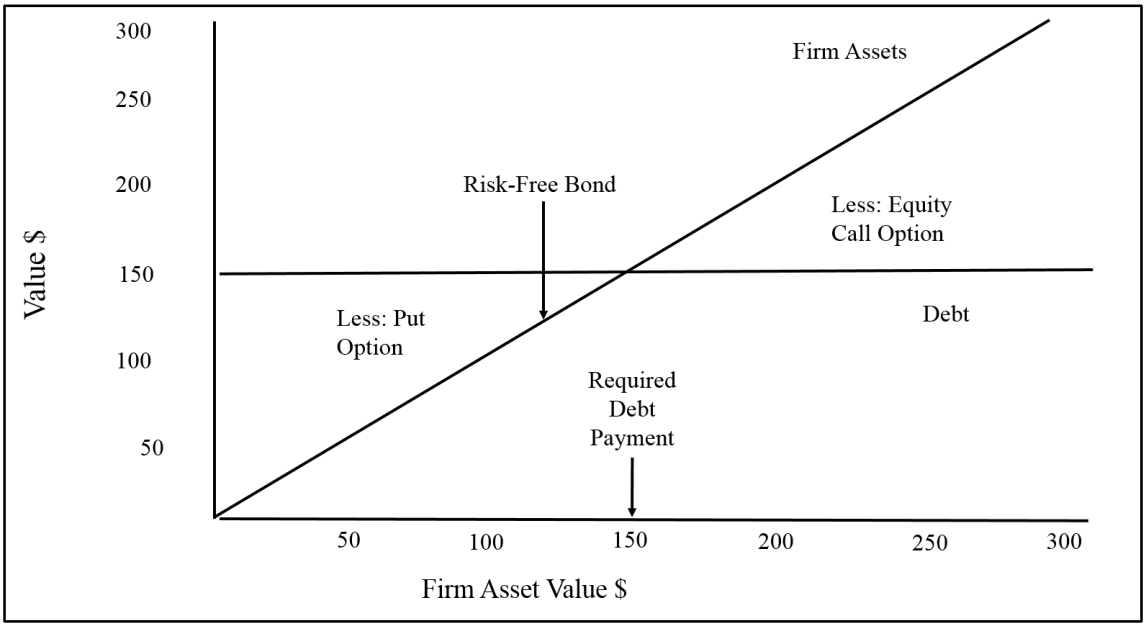

Figure 1 represents the pricing idea developed by Robert Merton (1974). Thus, Debt can be priced as the assets of a company less an equity call option or a portfolio consisting out of a put option and a risk free bond (See Berk, J./DeMarzo, P., 2014, P.728)

Table 4: Overview over the financial Ratios

Financial Ratio	Sub-Ratios for Calculation	Explanation	Calculation
TOT_DEBT_TOT_ASSET*	None	Total debt to total assets (in percentage) is calculated as	$\frac{ST\ Borrowings + LT\ Borrowings}{Total\ Assets} * 100$
RETURN_ON_ASSET*	None	Gives an indicator about the profitability of the company. Calculated in percentage	$\frac{Trailing\ 12M\ Net\ Income}{Average\ Total\ Assets}^{13} * 100$
BS_TOT_ASSET*	None	The total of all short and long-term assets as reported in the Balance Sheet	None
FNCL_LVRG*	None	Represents the ratio of average total assets divided by average common equity.	$\frac{Average\ Total\ Assets}{Average\ Total\ Common\ Equity} * 100$
	NET_DEBT_PER_SHARE*	Returns the net debt of each share outstanding at the end of the year.	
RATIO_NET_DEBT	AVERAGE_SHARE_PRICE*	Calculation of the average daily share price for the one year period starting on the 01.01 and finishing on the 31.12 of the year	$\frac{NET\ DEBT\ PER\ SHARE}{AVERAGE\ SHARE\ PRICE} * 100$

Ratios with an asterisk (*) were defined in accordance with the definition of Bloomberg (For further information see Bloomberg FA); the other ratios represent calculations by the author based on ratios or data of the Bloomberg Database