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## Corporate Spin-Offs in the United Kingdom

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A study of the wealth effects



This paper examines the wealth effects of 90 completed spin-offs in the United Kingdom that were announced from January 1987 up to December 2010. The change in corporate focus, the level of information asymmetry, the relative size, board monitoring effectiveness and takeover interest are investigated as possible sources of the wealth effects. The announcement of spin-offs lead to a significantly positive wealth effect of 4.46% over the three-day window. There is no evidence for long-term wealth effects associated with a spin-off, as the results are mostly insignificant. Firms for which no takeover interests are reported prior to the spin-off announcement, earn a significantly higher return in comparison to those where such interest was present.

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## Table of Contents

|                                                              |    |
|--------------------------------------------------------------|----|
| 1. Introduction .....                                        | 2  |
| 2. An overview of spin-off literature.....                   | 5  |
| 2.1 Defining corporate spin-offs .....                       | 5  |
| 2.2 General motives for spin-offs .....                      | 5  |
| 2.3 Value creation from spin-offs .....                      | 6  |
| 2.3.1. Wealth effects of spin-off announcements .....        | 6  |
| 2.3.2. Long-term wealth effects of completed spin-offs ..... | 8  |
| 2.3.3. Operational improvement following spin-offs.....      | 11 |
| 2.4 Factors explaining spin-off wealth effects .....         | 11 |
| 2.4.1. Increase in corporate focus.....                      | 11 |
| 2.4.2. Takeover activity .....                               | 12 |
| 2.4.3. Improved capital allocation .....                     | 13 |
| 2.4.4. Reduced information asymmetry .....                   | 14 |
| 2.4.5. Wealth transfer of bondholders .....                  | 15 |
| 2.4.6. Corporate governance impact on spin-offs .....        | 16 |
| 2.4.7. Clientele effects .....                               | 18 |
| 2.4.8. Spin-off size .....                                   | 18 |
| 3. Hypotheses.....                                           | 19 |
| 4. Data description and methodology .....                    | 22 |
| 4.1. Data sources and sample construction.....               | 22 |
| 4.2. Variable definition.....                                | 24 |
| 4.3. Methodology.....                                        | 27 |
| 4.3.1. Event study methodology .....                         | 27 |
| 4.3.2. Long-term abnormal return methodology .....           | 29 |
| 5. Results .....                                             | 30 |
| 5.1. Short-term wealth effects.....                          | 30 |
| 5.2. Long-term wealth effects.....                           | 39 |
| 6. Conclusions and suggestions for future research .....     | 43 |
| 7. References.....                                           | 45 |

## 1. Introduction

*“There are cases where businesses are grouped together under a single company umbrella. They could in practice be run more dynamically and effectively if they could be ‘demerged’ ... and allowed to pursue their own separate ways under independent management”*

– Budget speech of Geoffrey Howe, British Chancellor of the Exchequer, 1980.

When a company decides to restructure its activities by way of a spin-off, it distributes shares of a business unit to its shareholders in an equal proportion to the shares owned. The short-term wealth effects of corporate spin-offs have extensively been documented in academic literature. Most of the studies analyzing the wealth effects are based on United States (US) data but over the last two decades, also studies on European (EU) and international data were published<sup>1</sup>. On average, they find that a spin-off leads to a positive abnormal return for the stock of the company who announced the spin-off (the parent firm). The European short-term wealth effects for completed spin-offs are found to be of a smaller magnitude than those in the US. In addition, several studies<sup>2</sup> investigated the stock performance of completed spin-offs on the long-term. The earlier US studies found evidence for outperformance of spin-offs on a longer time period. However, more recent studies report no long-term abnormal stock returns when using more refined measuring techniques.

The motivation to spin off a company has often to do with a restructuring of the parent firm with the goal to gain operational improvement in both the parent and subsidiary. Past research has forwarded various potential reasons for the wealth effects associated with spin-offs<sup>3</sup>. Most often it has been attributed to an increase in corporate focus, a reduction in information asymmetry, the relative size of the spin-off, a wealth transfer from bondholders and improved investment efficiency.

The number of studies towards wealth effects of spin-offs in Europe is less in comparison to the number of US studies. This is probably the case because spin-off activity in Europe commenced later than in the US and was less intense at the start. While spin-offs in the US are common since the 1950s, in Europe spin-off legislation was only just introduced in 1990. The British government was earlier, and took on legislation to stimulate spin-offs in 1980 under the leadership of Geoffrey Howe. Since the introduction of spin-off legislation, activity in

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<sup>1</sup> Table 1 gives an overview of the documented short-term wealth effects of spin-offs.

<sup>2</sup> Table 2 gives an overview of the studies investigating the long-term wealth effects of spin-offs.

<sup>3</sup> Potential sources of the wealth effects will be discussed to a large extent in section 2.4.

Europe increased, as it became a more common restructuring method. So far, most spin-offs have a United Kingdom (UK) origin (Kirchmaier, 2001).

Unlike the documented wealth effects of spin-offs and its sources for the US and Europe, there has been little comparison with the UK, as it is generally assumed to be similar to the European findings. A study on the national level could give more unique results. This study attempts to clarify the wealth effects that are associated with corporate spin-offs in the UK. Only the European oriented research of Veld and Veld-Merkoulova (2004) and Qian and Sudarsanam (2007) report separate positive short-term wealth effects for UK spin-offs in line with their EU results. Qian and Sudarsanam also found that the relative size of the spun-off company has a positive effect on the short-term abnormal returns. In a study focused specifically on UK spin-offs, Murray (2008) reports only very small positive results and finds no evidence for long-term outperformance of spin-offs.

The wealth effects associated with spin-offs in the UK may be different from the findings for EU and US oriented studies for a few reasons. Firstly, the UK has a much larger equity market in comparison with other EU countries and historically most EU spin-off activity took place in the UK. Furthermore, it is the only EU country that has a common law system (except for Ireland), just like the US. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998) found that a common law system gives investors relatively more ease to exercise its rights against managers of companies. Also, while in general the common law governed systems have strong creditor rights, it is striking that the US has one of the most anti-creditor common law systems whereas the UK scores very high (La Porta et al., 1998). The protection investors receive has an influence on how firms are financed and ownership is structured. Thus, this could also have an influence on the outcome of a spin-off. Spin-off results could therefore be different when both creditors and shareholders have strong rights, as is the unique case in the UK. Creditors in the UK may be able to capture some of the wealth effects whereas a wealth transfer from bondholders will be less likely. Finally, Murray (2008) finds that unlike in the US, the UK companies in his study mostly use bank debt instead of publicly quoted debt and argues that as a result they are better positioned to defend their interests than widely dispersed bondholders.

The sole focus on the UK helps to extend and examine more specifically the previous findings of spin-offs in the UK, as the number of observations is enlarged. Similar to previous studies of UK spin-offs<sup>4</sup>, the short-term wealth effects of announced and completed spin-offs in the UK are investigated. Subsequently, based on the literature review, several sources are investigated that could explain the short-term wealth effects. Finally, long-term outperformance of firms involved in a spin-off is studied and potential sources of influence are explored

The studied sample includes all 90 announced and completed spin-offs in the UK for the period January 1987 up to December 2010. The most important obtained results are the following. The three-day cumulative average abnormal return equals 4.46%. Unlike Daley, Mehrotra and Sivakumar (1997) and some other studies<sup>5</sup> who found a similar effect, I report no significant positive relation for focus increasing spin-offs. Also the positive relation found by Krishnaswami and Subramaniam (1999) between the level of information asymmetry and the short-term wealth effects is not present in this study. The relative size is at first found to have a positive effect on the spin-off cumulative average abnormal returns, but this effect is muted when year- and industry fixed effects are added in regressions. Board monitoring effectiveness has no influence on the short-run results. The presence of takeover interest prior to a spin-off announcement has a significantly negative impact on the short-term abnormal returns. A potential explanation for this newly observed effect could be the adjustment of expected returns by disappointed investors who anticipated a takeover premium.

The rest of this paper is structured as follows. In Section 2 an overview of the wealth effect literature of spin-offs is given. In section 3, the hypotheses are developed. Section 4 describes the methodology and data that were used. In section 5, the short and long-term wealth effects are presented and discussed. Finally, section 6 provides conclusions and suggestions for future research.

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<sup>4</sup> That is, the research of Schauten et al. (2001), Veld and Veld-Merkoulova (2004), Qian and Sudarsanam (2007) and Murray (2008).

<sup>5</sup> In section 2.4.1. studies about and related to the effect of corporate focus are discussed.

## 2. An overview of spin-off literature

### 2.1 *Defining corporate spin-offs*

A spin-off is a divisive transaction on both the corporate and the shareholder level where the parent company is divided into more corporations. In a spin-off transaction, the shares of an existing or newly created subsidiary corporation are distributed to current shareholders as a dividend on a pro-rata basis. After the event, the subsidiary is a publicly traded company that has its own board of directors, which operates independently from the parent company. Unlike other divestiture methods, the parent company does not receive any cash flow from the spin-off transaction. It is a unique way to divest a business because it allows for a direct comparison of parent and spin-off on stock and operating performance metrics after the transaction.

Tax laws in general are favorable for spin-off transactions in the US and the UK. A spin-off transaction enables a company to divest a subsidiary company tax-free if structured under certain requirements. Under US corporate tax law, compliance with §355 of the Internal Revenue Code permits tax-free distribution. Important requirements to achieve the tax-free treatment of the divisive transaction are firstly, that the parent must be in “control” of the subsidiary ( $\geq 80\%$  ownership) and distribute this to its shareholders. Secondly, both parent and spin-off must still be engaged in trade or business activities after the transaction and finally, the transaction should not be devised with the intent to distribute profits. If the spin-off does not comply with §355 of the Internal Revenue Code, the resulting capital gain is taxed at the corporate tax rate and shareholders pay a dividend tax over the distributed stock. From a UK tax perspective, similar requirements as under US corporate tax law apply for the spin-off to be placed under the ‘exempt demerger’ relief provision of the Corporate Tax Act 2010 part 23 chapter 5. This excludes the company from paying taxes on disposal and stamp duty. The possibility to divest a subsidiary tax-free via a spin-off seems rather attractive, as tax costs from a taxable sale in the US were on average 8% of the market value of the distributed stock in a study of Maydew, Schipper, and Vincent (1999). A possible explanation to incur avoidable tax costs would be to gain earnings and cash flow benefits if the acquisition premiums on the sales exceed the avoidable tax costs.

### 2.2 *General motives for spin-offs*

Although in perfect capital markets under the Modigliani-Miller (1958) assumptions a divestiture has no influence on business value, there are many theories that explain why a divestiture could be efficient. They can be roughly categorized into a few motives:

- Restructuring motives: where a divestiture is aimed at increasing focus, unwinding underperforming businesses, realigning management or a value transfer from bondholders.
- Financial transparency: when the goal is to increase the information the company is able to provide to capital markets by reducing complexity.
- Tax & regulatory motive: a divestiture might have the intent to deliver tax benefits or enable a reduction in regulatory concerns if it is not already forced.

## *2.3 Value creation from spin-offs*

### *2.3.1. Wealth effects of spin-off announcements*

In the past few decades, a large number of studies analyzed the short-term wealth effects of a spin-off in the form of abnormal stock price increases around the announcement of a spin-off transaction. This measures the effect of a spin-off announcement on the firm's stock and indicates the wealth effects to the party most affected by such a transaction, the shareholders of the firm. Table 1 on the page below, shows that most studies found significant positive average cumulative abnormal returns (CARs) regardless of the sample period, sample size, event window or country. The oldest study investigated the period of January, 1963 to December 1980 and found a significant average CAR of 3.34% on a sample of 55 stocks (Miles and Rosenfeld, 1983), while the latest study investigated the event period 1986-2005 and found a significant mean CAR of 4.86% (Jain, Kini and Shenoy, 2011). Overall, CARs ranging from a low 1.32% to 5.56% have been found; all studies provide evidence of a short-term wealth effect as a result of a spin-off announcement. It is interesting to see an almost equal CAR for the European based study of Qian and Sudarsanam (2007) and the US study of Jain et al. (2011) (4.82% versus 4.86%), which differ only in a one year longer sample period and notably smaller sample size for the US study. While Veld and Veld-Merkoulova (2004) find lower CARs for their UK subsample, Qian and Sudarsanam find higher cumulative average abnormal returns for the UK companies. The spin-off announcement studies are predominantly based on US data as spin-offs have so far occurred more often in the US. The amount of research on corporate spin-off wealth effects outside the US is limited in comparison with the amount of research done on non-US merger and acquisitions or initial public offerings (Kirchmaier, 2003). Although the magnitude of the CARs in Table 1 differs per study, they indicate a short-term wealth effect as a result of a spin-off announcement.

**Table 1.** Studies of the short-term wealth effects associated with spin-off announcements

| Study                               | CAR (in %)              | Sample Period | Region | Sample Size | Event Window |
|-------------------------------------|-------------------------|---------------|--------|-------------|--------------|
| Miles and Rosenfeld (1983)          | 3.34***                 | 1963-1980     | US     | 55          | [0,1]        |
| Schipper and Smith (1983)           | 2.84***                 | 1963-1981     | US     | 93          | [-1,0]       |
| Hite and Owers (1983)               | 3.3***                  | 1963-1981     | US     | 123         | [-1,0]       |
| Rosenfeld (1984)                    | 5.56***                 | 1963-1981     | US     | 35          | [-1,0]       |
| Seifert and Rubin (1989)            | 3.26***                 | 1968–1983     | US     | 51          | [-1,0]       |
| Allen et al. (1995)                 | 2.15***                 | 1962-1991     | US     | 94          | [-1,0]       |
| Slovin et al. (1995)                | 1.32**                  | 1980–1991     | US     | 37          | [0,1]        |
| Seward and Walsh (1996)             | 2.6***                  | 1972–1987     | US     | 78          | [-1,0]       |
| Daley et al. (1997)                 | 3.4***                  | 1975–1991     | US     | 85          | [-1,0]       |
| Best et al. (1998)                  | 3.41***                 | 1979-1993     | US     | 72          | [-1,0]       |
| Desai and Jain (1999)               | 3.84***                 | 1975-1991     | US     | 144         | [-1,1]       |
| Krishnaswami and Subramaniam (1999) | 3.28***                 | 1978-1993     | US     | 118         | [-1,1]       |
| Mulherin and Boone (2000)           | 4.51***                 | 1990–1999     | US     | 106         | [-1,1]       |
| Schauten et al. (2001)              | 2.13 <sup>unknown</sup> | 1989–1996     | UK     | 23          | [-1,1]       |
| Wruck and Wruck (2002)              | 3.58 <sup>unknown</sup> | 1985-1995     | US     | 172         | [-1,0]       |
| Burch and Nanda (2003)              | 3.7 <sup>unknown</sup>  | 1979-1996     | US     | 106         | [-2,1]       |
| Maxwell and Rao (2003)              | 3.59***                 | 1976–1997     | US     | 79          | [0,1]        |
| Kirchmaier (2003)                   | 5.4***                  | 1989–1999     | EU     | 48          | [-1,1]       |
| Ahn and Denis (2004)                | 4.03 <sup>unknown</sup> | 1981-1988     | US     | 150         | [-1,1]       |
| Veld and Veld-Merkoulova (2004)     | 2.62***                 | 1987–2000     | EU     | 156         | [-1,1]       |
| Veld and Veld-Merkoulova (2004)     | 2.54***                 | 1987–2000     | UK     | 70          | [-1,1]       |
| McNeil and Moore (2005)             | 3.53***                 | 1980-1996     | US     | 153         | [-1,1]       |
| Sin and Ariff (2006)                | 1.80*                   | 1986-2002     | MY     | 85          | [-1,0]       |
| Qian and Sudarsanam (2007)          | 4.82***                 | 1987-2005     | EU     | 157         | [-1,1]       |
| Qian and Sudarsanam (2007)          | 5.48***                 | 1987-2005     | UK     | 72          | [-1,1]       |
| Veld and Veld-Merkoulova (2008)     | 3.07***                 | 1995-2002     | US     | 91          | [-1,1]       |
| Murray (2008)                       | 1.82***                 | 1992–2004     | UK     | 60          | [-1,1]       |
| Chemmanur et al. (2010)             | 2.19***                 | 1990-2000     | INT    | 139         | [-1,1]       |
| Jain et al. (2011)                  | 4.86***                 | 1986-2005     | US     | 46          | [-1,1]       |
| Boreiko and Murgia (2013)           | 4.8***                  | 1989-2005     | EU     | 97          | [-1,1]       |

This Table presents the cumulative average abnormal stock returns (CARs) around the announcement of spin-offs.

Significance levels indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level. <sup>Unknown</sup> means the significance level was not reported.

US: United States sample, EU: European sample MY: Malaysian sample and INT: international sample.

### *2.3.2. Long-term wealth effects of completed spin-offs*

In addition to studies investigating the announcement period CARs, there are also several studies that investigated whether the abnormal returns of completed spin-offs continue for the long-term. This is a smaller number of studies as it is difficult to measure the long-term spin-off effects due to other company specific factors that could influence the long-term stock performance. Also, the announcement date CARs could already reflect the expectations of shareholders about the parent and spin-off in an efficient capital market. However, several studies (e.g. Sirower, 1998 and Limmack, 1991) investigating the long-term wealth effects of mergers and acquisitions suggest that the market systematically under- or overestimates the long-term performance from the day of the announcement. Cusastis, Miles and Woolridge (1993) motivate their research both by the scarcity of evidence on how spin-offs create value and the claims in the business press that spin-offs deliver superior returns. Table 2 on the following page, highlights a few studies that have investigated the long-term abnormal returns via the Buy-and-Hold Abnormal Returns (BHARs) methodology. These studies often distinguish between the wealth effects created in the parent company, spin-off and pro-forma combined firm. The combined firm return estimates are created by a weighted average on market values of the parent and spin-off at the ex-date.

**Table 2.** Studies of the long-term wealth effects associated with completed spin-offs

| Study                                        | Type            | Method              | Sample period | Sample size | Region | t + 6 months  | t + 12 months    | t + 24 months     | t + 36 months     |
|----------------------------------------------|-----------------|---------------------|---------------|-------------|--------|---------------|------------------|-------------------|-------------------|
| Cusatis et al. (1993)                        | Combined        | BHAR <sup>IND</sup> | 1965-1988     | 141         | US     | n.a.          | 4.7              | 18.9**            | 13.9              |
|                                              | Parent Spin-off |                     |               | 131<br>146  |        | 6.8*<br>1.0   | 12.5**<br>4.5    | 26.7***<br>25.0** | 18.1<br>33.6**    |
| Desai and Jain (1999)                        | Combined        | BHAR <sup>IND</sup> | 1975-1991     | 155         | US     | n.a.          | 7.69             | 12.7              | 19.82***          |
|                                              | Parent Spin-off |                     |               | 155<br>162  |        | n.a.<br>n.a.  | 6.51<br>15.69*** | 10.58<br>36.19*** | 15.18<br>32.31*** |
| McConnell et al. (2001)                      | Parent          | BHAR <sup>IND</sup> | 1989-1995     | 80          | US     | 8.64          | 13.48            | 19.21             | 5.14              |
|                                              | Spin-off        |                     |               | 96          |        | 8.90          | 7.21             | 5.75              | -20.87            |
| Schauten et al. (2001)                       | Spin-off        | BHAR <sup>M</sup>   | 1989-1996     | 23          | UK     | 7.43          | 5.88             | 11.89             | 16.12             |
| Kirchmaier (2003) <sup>b</sup>               | Combined        | BHAR <sup>MA</sup>  | 1989-1999     | 34          | EU     | 1.3           | 2.6              | -0.3              | n.a.              |
|                                              | Parent Spin-off |                     |               | 34<br>41    |        | 1.2<br>4.2    | -0.3<br>4.6      | -4.6<br>-0.6      | n.a.<br>n.a.      |
| Veld and Veld-Merkoulova (2004) <sup>b</sup> | Combined        | BHAR <sup>MTB</sup> | 1987-2000     | 61          | EU     | -2.23         | -2.33            | 4.24              | 2.01              |
|                                              | Parent Spin-off |                     |               | 106<br>70   |        | 3.88<br>11.96 | -0.65<br>12.58   | 6.49<br>13.72     | -0.41<br>15.15    |
| Qian and Sudarsanam (2007)                   | Combined        | BHAR <sup>IND</sup> | 1987-2002     | 99          | EU     | n.a.          | -2               | 7                 | 2                 |
|                                              | Parent          |                     |               | 99          |        | n.a.          | 1                | 13                | 7                 |
|                                              | Spin-off        |                     |               | 107         |        | n.a.          | 5                | 16                | 22                |
| Harris and Madura (2010) <sup>b</sup>        | Spin-off        | BHAR <sup>MTB</sup> | 1981-2006     | 311         | US     | n.a.          | 17.32***         | 24.58***          | 26.15***          |

This Table presents the equal weighted average Buy-and-Hold Abnormal Returns (BHARs) of completed spin-offs for parents, spin-offs and combined firms. Significance levels indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

t is the percentage return from the initial trading date, n.a. means not available.

<sup>IND</sup> buy and hold returns corrected by matching firms on size and two digit SIC code. <sup>M</sup> buy and hold returns corrected by market index.

<sup>MA</sup> buy and hold returns corrected by market adjusted return. <sup>MTB</sup> buy and hold returns correct by matching firms on size and market-to-book ratio.

<sup>a</sup> In the Kirchmaier study t+6 is equal to the 100-199 trading days, in t+12 it is equal to the 300-399 trading days and in t+24 it is equal to the 600-699 trading days.

<sup>b</sup> In the studies of Kirchmaier, Veld and Veld-Merkoulova; and Harris and Madura the sample size is different for each event window, the reported sample size is the number of observations at t+6 months.

The oldest study on this topic by Cusatis et al. (1993), found significant positive BHARs for spinoffs, their parents, and the combined firm for the two-year period after initial trading (ex-date). They noticed an unusual amount of takeovers in comparison with the control groups and only found significant positive BHARs if these remain in the sample. Their findings suggest that the abnormal returns created by spin-offs are attributable to the firms involved in takeover activity. Desai and Jain (1999) studied the post-spin-off long-term stock market performance to find out whether an increase in focus explains the abnormal returns associated with spin-offs. In contrast to Cusatis et al., they found significant positive BHARs for the spin-offs only. When they split the sample in focus-increasing firms and non-focus-increasing firms, they concluded that only the focus-increasing combined firms and spin-offs deliver significant positive BHARs. They argued that the results are not driven by takeover activity as Cusatis et al. suggests, since the results are similar when the analysis is done on firms that were not involved in takeover activity.

Fama (1998) remarked that the long-term abnormal returns findings of Cusatis et al. assumed the BHARs of the event firms to be independent when calculating the t-statistics. Adjusting t-statistics for cross-correlation would lead to insignificant results for the study. McConnell et al. (2001) studied BHARs using a similar approach as Cusatis et al., and found positive results in all event windows except for the three year holding period of the spin-off. In contrast to Cusatis et al., however, these were not significant. When they followed the suggestion of Fama to calculate cumulative matching-firm-adjusted returns (CMFARs), the results remained insignificant, but the signs changed to negative for the parent 24-month and 36-month CMFARs. They also applied two methodologies suggested by Barber and Lyon (1997), a size and book-to-market matching portfolio procedure and the Fama and French (1993) three-factor model<sup>6</sup>. For both methodologies abnormal returns were found to be positive in all instances, but only significant for several cases with the size and book-to-market matching benchmark. As a result, they concluded that the long-term wealth effects associated with completed spin-offs provide a shaky basis for rejecting the efficient market hypothesis.

The studies of BHARs in Europe by Kirchmaier (2003), Veld and Veld-Merkoulova (2004); and Qian and Sudarsanam (2007) indicate that European capital markets react efficiently on the spin-off announcements as no long-term wealth effects are to be expected<sup>7</sup>. Kirchmaier found only weak evidence (significant at the 10% level) for spin-off long-term abnormal returns of 17.3% over 780 trading days.

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<sup>6</sup> Desai and Jain (1999) also apply the control firm approach of Barber and Lyon (1997) but do not report the results in their paper since they are similar across all the four alternative benchmarks they used.

<sup>7</sup> Veld and Veld-Merkoulova used t-statistics corrected for cross correlation as described in Lyon et al. (1999)

### *2.3.3. Operational improvement following spin-offs*

Several authors examined whether the operating performance as a result of a spin-off improves for parent and spun-off unit. As an improvement in operating performance should also be reflected in the subsequent stock performance after a spin-off, the spin-off research mostly uses stock price as performance metric. Research directed towards operational improvement following a spin-off is mostly searching for an explanation why spin-offs with certain characteristics outperform (e.g. change in focus, amount of anti-takeover provisions, management characteristics). There is mixed evidence on the improvement of operating performance as a result of a spin-off completion. Woo, Willard and Daellenbach (1992) and Chemmanur, Jordan, Liu and Wu (2010) concluded that American spin-offs, on average, experience no increase in operational performance in the long-term. Whereas Cusatis et al. (1993) discover an increase of operating income (a proxy for operating performance) of 7% starting one year before the spin-off distribution until two years thereafter. However, their other operating performance proxies (sales growth and changes in assets) do not indicate any statistically significant results. Murray (2008) documents a small improvement in accounting measures of performance relative to industry average values after the spin-off in the UK. Some other studies<sup>8</sup> also find evidence of an improvement in operating performance after a spin-off distribution.

## *2.4 Factors explaining spin-off wealth effects*

In addition to studies analyzing the wealth effects associated with a spin-off on the short- and long-term, there is an extensive amount of research that attempts to explain the sources of the wealth effects of spin-offs. The following selection of literature discusses potential factors.

### *2.4.1. Increase in corporate focus*

An often mentioned source for the wealth effects of spin-offs is an increase in corporate focus. It can increase the value of the firm when managers do not have the necessary managerial skills to manage the non-core assets. Thus, when non-core assets are divested from operations, remaining core-assets are better managed after the spin-off distribution (Desai and Jain, 1999). Value losing cross-subsidies, which are often sustained in diversified firms, are also reduced when a firm increases focus (Meyer et al., 1992; Berger and Ofek, 1995).

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<sup>8</sup> Daley et al. (1997), Desai and Jain (1999) and Ahn and Denis (2004)

Hite and Owers (1983) found that a subsample that stated improvement in focus as motivation for the spin-off transaction, achieved the largest abnormal returns in the period from 50 days before the spin-off announcement until the completion of the spin-off. Measuring focus by means of change in two-digit SIC<sup>9</sup> code, Daley et al. (1997), Desai and Jain (1999) and Krishnaswami and Subramaniam (1999) showed that focus-increasing spin-offs deliver higher abnormal returns in comparison to non-focus-increasing spin-offs. Veld and Veld-Merkoulova (2004) and Boreiko and Murgia (2013) found similar results for spin-offs which increase corporate focus in Europe. To study the possible effects differently, Daley et al. also measured improvement in operating performance following a spin-off and found significant improvement for focus increasing spin-off transactions. Desai and Jain similarly found superior performance of focus increasing spin-offs for holding periods of one, two and three years after the spin-off distribution. They extended the evidence by also providing a direct positive association between change in focus and operational performance. By studying the aggregate improvement in value for diversified firms following a spin-off and relating this to changes in diversity, Burch and Nanda (2003) concluded that reductions in diversity improve aggregate value. These results are in line with those from asset sale studies<sup>10</sup>, which document that dispositions involving assets outside of the core business increase value while disposition of core business assets do not.

#### *2.4.2. Takeover activity*

In one of the earlier studies investigating the abnormal return effects of spin-off announcements, Cusatis et al. (1993) found that companies that were involved in a spin-off distribution experience significantly more takeover activity than their control groups. They also found that only firms that report takeover activity within three years, experience positive long-term abnormal returns. Their findings suggest that value is created by efficiently transferring control to acquiring firms. Chemmanur and Yan (2004) developed a model that explains the value increases resulting from an increased probability of corporate takeover. In this model, all shareholders benefit in many situations if incumbent management relinquishes control of the spin-off to a more capable rival. The increased chance of loss of control as a result of a spin-off motivates incumbent management. It can either work harder to minimize the chance of being taken over or relinquish control to a more capable rival. This rationale explains the operational and value increases they find arising from spin-offs.

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<sup>9</sup> SIC is a Standard Industry Classification code

<sup>10</sup> See John and Ofek, 1995; Berger and Ofek, 1995; Comment and Jarrell, 1995; Denis and Shome, 2005.

### *2.4.3. Improved capital allocation*

A spin-off distribution may reduce the misallocation of capital across a firm as the amount of resources and opportunities is decreased and are put more towards their efficient use. For previous bad acquisitions, Allen, Lummer, McConnell, and Reed (1995) found evidence that the gains as a result of spin-offs have a component that represents the regain of value lost. They evidenced positive spin-off announcement returns for a sample wherein the spun-off unit was previously acquired. The positive announcement returns were also negatively correlated with the previous acquisition announcement return. While looking at the change in investment behavior that occurs after a spin-off, Gertner, Powers and Scharfstein (2002) report the investment behavior for the spun-off unit to be significantly more sensitive to measures of investment opportunities. The increased sensitivity to investment opportunities was particularly pronounced for spin-offs that operate in unrelated industries to their parent's, and for spin-offs with large announcement abnormal returns. The main advantage of their study is that they compared the allocation of capital of the same business in the internal and external capital market and their results indicate an increased efficiency in capital allocation as a result of a spin-off distribution. Instead of focusing only on the spun-off unit, Ahn and Denis (2004) provide additional evidence that due to investing inefficiently prior to the spin-off, the pre-spinoff firms trade at a significant valuation discount in comparison to their stand-alone industry peers. This discount is removed for the combined firm after a spin-off distribution as the investment efficiency is significantly improved.

McNeil and Moore (2005) found additional evidence for increases in firm value as a result of improved capital allocation. Spun-off units in their study that were subsidized prior to the distribution reduce capital investments relative to their industry level peers, while the opposite pattern occurs for spin-offs that were rationed before the divestment. Also, inefficient allocators of capital expenditures pre-spinoff appeared to become more efficient after the divestment, while the reverse happens for efficient allocators as both move toward the industry levels. The announcement abnormal returns were significantly higher if investment efficiency was relatively low prior to the spin-off distribution.

A recent study by Chemmanur, Krishnan and Nandy (2014) investigated the improvement of capital allocation surrounding spin-offs by assessing total factor productivity (TFP) of plants before and after the divestment using detailed plant-level data from the Longitudinal Research Database (LRD). Using that data, they were able to establish more precisely the source of spin-off value and performance increases. They found an overall improvement in efficiency (measured by TFP) in both improvements after the spin-off, and efficiency growth

from prior to after the spin-off. Increases came primarily from decreases in labor and materials costs, rather than increases in sales, and continue for five years after the divestment. In particular, plants remaining with the parent company experienced efficiency improvements prior to the spin-off until after, while divested plants did not. Parent companies also invested more in their plants after the spin-off in comparison to the new spin-off's plants. To conclude, their research indicates in a detailed manner that spin-offs improve capital allocation, especially in the parent firm.

#### *2.4.4. Reduced information asymmetry*

Since a spin-off transaction causes both the parent and the spin-off to become smaller and thus less complicated, it makes it easier for everyone to assess a firm's operations and future prospects and thus reduces information asymmetry. The increased quality of information after a spin-off makes prices more informative according to Habib et al. (1997). For managers, it improves the quality of investment decision they make and for uninformed investors uncertainty about asset values is reduced. As a result of these two effects, the market value of the combined firm is greater than the market value of the original firm. Nanda and Narayanan (1999) provide a model wherein they indicate that the unobservability of divisional cash flows may undervalue firms and a divestiture improves the ability to value those assets. Since a firm does not receive money following a spin-off, the reason to execute a spinoff would be to correctly value the firm for future external capital needs.

As analysts play an important role in presenting and delivering information to the financial markets, Gilson, Healy, Noe and Palepu (2001) research whether breakups affect type, quantity and quality of financial analyst coverage. They find an increase in coverage by analysts, primarily by analysts specialized in the spin-off's industry. There is also better forecast accuracy for both the parent and spin-off, which they mainly contribute to the improvement in forecast accuracy of specialists. This shows prices become more informative as a result of spin-offs as they cause a more permanent change in a firm's information asymmetry. However, Huson and Mackinnon (2003) find that idiosyncratic volatility increases when parent firms divest unrelated spin-offs. They believe that as a consequence of the increased idiosyncratic volatility, informed traders benefit at the expense of uninformed traders because they can either better exploit the available information or their current private information increases in value as a result of added public information.

Using analyst's earnings prediction errors as a proxy for information asymmetry, Best, Best and Agapos (1998) find a significant differential announcement abnormal return for firms divided on earnings prediction errors.

Krishnaswami and Subramaniam (1999) are the firsts who research whether a reduction in information asymmetry is a source of the wealth effects associated with spin-offs. They find that value gains from spin-offs are higher for firms with higher levels of information asymmetry. In addition, they find higher levels of information asymmetry in firms engaged in spin-offs in comparison to their industry and size matched counterparts and a significant decrease in information asymmetry after the divestment.

#### *2.4.5. Wealth transfer of bondholders*

Although several studies point out that spin-offs benefit shareholders, the effect on bondholders is less evident. Bondholders could potentially also benefit from the increase in value of the firm. An alternative is that bondholders transfer value to stockholders as a result of a spin-off. This could happen because collateral is reduced and liquidation value of assets is reassigned. Another potential reason could be the elimination of coinsurance provided by several operating division where the cash flows are not perfectly correlated (Galai and Masulis, 1976). Early studies (Hite and Owers, 1983; Schipper and Smith, 1983; Dittmar, 2004) find no evidence for a wealth transfer of bondholders on the announcement of a spin-off. Schipper and Smith (1983) and Dittmar (2004) see a decline in bond ratings for very few companies after a spin-off announcement. Parrino (1997) however, did find a wealth transfer from bondholders to stockholders in a case study of the Marriott Corporation. In this case study, Parrino found that the initial spin-off plan would assign most of the debt to the parent company, which would hold the hotel assets but delivered lower cash flows. The spin-off would receive little debt, manage the hotel assets and have higher cash flows. The study indicates that bondholders of Marriott Corporation were worried about the possible loss of collateral in this case.

Maxwell and Rao (2003) questioned the results of earlier studies as a result of the limited sample size and access to bond price data. They also research the wealth transfer hypothesis using a larger sample and find negative abnormal returns for bondholders of -0.88% for spin-off announcements. As they also find an overall increase in value as a result of a spin-off, the bondholder wealth transfer only partly explains the value gain of stockholders. In their study, the loss of collateral to bondholders explains the larger losses to bondholders and gains to stockholders. Veld and Veld-Merkoulova (2008) contradict the findings of Maxwell and Rao as they find either positive (0.14%) or negative (-0.14%), but nonsignificant abnormal returns for bondholders. To check the difference between the study of Maxwell and Rao, they split the sample in two subsamples of different periods of which one overlaps partly with Maxwell and Rao's sample. The negative insignificant abnormal return belongs to the sample with the partial overlap. This suggests the difference in results is driven by different sample data.

Veld and Veld-Merkoulova suggest that this could mean that bondholders learned from past experiences and became better at protecting against wealth transfers to shareholders.

In the UK, firms have mostly access to debt through banks and as a result, debt providers are more able to influence the initial decision to spin-off and influence the distribution of the expected excess returns. Murray (2008) found limited gains in shareholder wealth in the UK which is notably different to US studies, where firms use mostly traded debt. He believes this is the result of more limited opportunities to transfer bondholder wealth, which potentially changes the motivation for a spin-off.

#### *2.4.6. Corporate governance impact on spin-offs*

There are several possibilities why managers may wish to maintain status quo and prevent a spin-off from happening (e.g. empire building, risk reduction, unawareness or overconfidence). As a result, an effective corporate governance system measured by several corporate governance characteristics, such as board structure, ownership and incentives can influence the likelihood and performance of spin-offs. Ahn and Walker (2007) study the effectiveness of several such characteristics and find evidence that firms that score higher on effective corporate governance characteristics are more likely to initiate spin-offs. Specifically, the size of a conglomerate's board and the average age of the board decrease the probability of a spin-off, while higher stock ownership by outside board members and a diverse board increases the probability. They also find that relative valuation measures rise significantly ex-post in comparison with peer firms. This contradicts Quan and Sudarsanam (2007), who find weaker corporate governance systems are more likely in spin-off parents in comparison with their control firms.

Since a spin-off is a distribution of shares instead of a sale, it usually does not require a shareholder vote. As a consequence it gives the opportunity to saddle up the spin-off with a host of anti-takeover provisions. Daines and Klausner (2004) find evidence that anti-takeover provisions occur more often in spin-offs in comparison to IPO's where major shareholders influence governance terms. The anti-takeover provisions are often stronger than in the parent's charter and more prevalent if parent managers have weak incentives to maximize firm value or have a personal benefit by entrenching spin-off's management. Chemmanur et al. (2010) suggest that firms with more anti-takeover provision ex-ante have higher abnormal announcement returns and more improvements in operating performance after the spin-off. Moreover, firms reducing the number of anti-

takeover provisions after the spin-off show a better operational performance. Finally, the firm's CEO is likely to retain more anti-takeover provisions in the parent and assign fewer to the spin-off if he stays as CEO of the parent. In a related aspect, Harris and Madura (2010) suggest that the spun-off unit is more likely to adopt poison pills if the parent has anti-takeover provisions in place. This likelihood decreases with the amount of outside block ownership but increases with size, institutional ownership, industry takeover activity and relative industry market-to-book ratio. However, the adoption of poison pills does not reduce the probability of a takeover and is actually positively related to abnormal long-run returns.

As part of every spin-off, management is restructured as well. Wruck and Wruck (2002) find that firm-specific human capital and expertise in corporate governance are important in structuring the management team of the spin-off. They indicate that post-transaction, management overlaps are more likely on governance than on operating orientation. The way in which management is restructured, significantly explains the value created as a result of a spin-off announcement. Returns are highest when a top manager from the parent firm and a division head switch to the spin-off. A higher board independence or threat of takeover also lead to significantly higher long-term abnormal returns (Qian and Sudarsaman, 2007).

In addition to a restructuring of top management, managerial incentives can also be realigned as a result of a spin-off as divisional manager's performance can now be measured more reliably. It can, for example, be related to the operational and stock price performance of the spun-off firm. Pyo (2007) finds that operating performance is positively related to increases in managerial incentive pay for both the parent and the spin-off, while changes in business focus are not. Moreover, he notices that more incentive pay is offered to spin-off CEOs of firms focusing on increasing distributions. It thus appears spin-offs are used to re-incentivize management in a better way and improve firm performance.

#### *2.4.7. Clientele effects*

A spin-off offers investors the opportunity to buy shares in only the parent or the spin-off. The securities can have very different characteristics which can cause certain investors to flock to one of the two securities. Vijh (1994) finds that after the distribution, trading volumes in both parent and spin-off are significantly higher, despite the combined company being more expensive than before the spin-off. They find an abnormal stock return of 3% after the spin-off starts trading and believe this is the result of different clienteles that are attracted to the two listed stocks. As an investor that is only interested in one of the two stocks, would purchase after the distribution for several reasons. Firstly, because he would require a smaller cash investment. Secondly, because he would not have to sell the unwanted stock and thus incur transaction costs. Finally, he would not pay an uncertain price because of the relative valuation between parent and spin-off prior to distribution.

Abarbanell, Bushee, and Ready (2003) provide evidence that investment strategy and fiduciary restrictions affect institutional investor demand for stocks around a spin-off. However, they find limited evidence of abnormal returns after the spin-off starts trading as a result of institutional trading, only in extreme cases. As both the study of Vijh and Abarbanell et al. find notable increases in trading volumes, Chemmanur and He (2008) research the role of institutional investors around spin-offs. They find a significant imbalance in institutional trading between parents and spin-offs after the spin-off distribution, which suggests spin-off transactions reduce a trading constraint existing prior to the spin-off. This imbalance increases with the difference between information asymmetry, beta risk and long-term growth prospects. The institutional trading in the spin-off after distribution has also predictive power for long-term stock returns. These results suggest institutional investors play an information producing role in spin-offs.

#### *2.4.8. Spin-off size*

The relative size of a spin-off is found to have a positive effect on the short-term wealth effects associated with spin-offs. The early studies of Hite and Owers (1983) and Miles and Rosenfeld (1983) found this effect. The same effect is found in Europe in a study of Veld and Veld-Merkoulova (2004). It is intuitively clear since the impact of a larger divestiture can be expected to have a bigger effect as relatively more anticipated value reducing or obstructing activities are discarded.

### 3. Hypotheses

As the review of possible value factors in section 2.4. shows, there are multiple sources which can potentially explain the wealth effects associated with spin-offs. Using the literature review as a starting point, I formulate several hypotheses in this section that contribute to the main question of this study: to identify whether the wealth effects that are found in US and EU studies on spin-offs also occur in the United Kingdom and whether there are similar sources of wealth gains.

The first hypothesis explores whether the short-term wealth effects as result of a spin-off announcement, which are found in numerous US based studies and several EU based studies as posted in Table 1, are also prevalent on a national level in the United Kingdom. There is reason to believe the short-term wealth effects associated with a spin-off announcement are positive in the UK, as it falls under the countries studied in several EU samples. However, the magnitude of the wealth effects could be different as the UK is the only common law country in this region except for Ireland and is an environment wherein firms mostly rely on bank debt as a source of debt (La porta et al., 1998; Murray 2008). In a study of exclusively spin-offs in the UK, Murray (2008) attributed the smaller short-term abnormal returns he found to the bank debt dominated environment.

***H1: Spin-off announcements in the United Kingdom result in positive short-term abnormal returns to shareholders of the parent company.***

Early studies in Table 2 suggest long-term abnormal returns as a result of spin-offs in the US. A positive long-term abnormal return could be the result of improvements in the spin-off which are not directly reflected in the stock price on announcement. Those results suggest capital markets are not efficient and the semi strong efficient market hypothesis is invalid. Fama (1998) argues that apparent overreaction is just as likely as underreaction in studies challenging market efficiency on the long-term. He believes they are chance results, which leaves the efficient market theory intact. Most anomalies can be attributed to the methodology that was used. An out-of-sample replication can be convincing to prove long-term abnormal returns of spin-offs are not a result of chance. This results in the second hypothesis which explores whether the long-term abnormal returns associated with a spin-off in the UK are apparent and not the result of chance.

***H2: Long-term abnormal returns of parent, spin-off and pro-forma combined firms following spin-offs in the UK, are not significantly different from zero.***

Several studies in section 2.4.1. document higher announcement abnormal returns for spin-offs that increase corporate focus. There is no reason to believe an increase in corporate focus has other effects in the UK. By focusing, firms can put their resources to a best use and thus maximize the value of their personnel and assets. This leads to the following hypothesis:

***H3: Spin-offs that increase corporate focus deliver higher abnormal returns than non-focus increasing spin-offs.***

As discussed in section 2.4.2. an increased likelihood of a takeover could be a source of the wealth effects. The findings of Cusatis et al. (1993) indicate this to be the case for the long-term abnormal returns in their US sample of spin-offs. The model developed by Chemmanur and Yan (2004) explains the incentive that a spin-off forces on a manager, especially when there is a takeover threat. If a manager is not re-incentivized to operate the firm at its best or is not able to, the firm is likely to be taken over (possibly at a premium) by a more able operator. Thus, one can expect higher short-term wealth effects for firms who report takeover interest prior to the announcement as one expects better operating performance or the takeover of this firm:

***H4: Spin-offs with takeover interest prior to the spin-off announcement, deliver higher abnormal returns for shareholders.***

The studies of information asymmetry in the US, as described in section 2.4.4. lead to the assumption that similar positive short-term wealth effects surrounding spin-off announcements can be expected in the UK. As a spin-off breaks up a (complex) firm, one can expect higher abnormal announcement returns when the previous level of information asymmetry was high. As the information gaps between investors are likely reduced because the break-up leads to a reduction in complexity. Therefore:

***H5: A high degree of information asymmetry before a spin-off results in higher abnormal returns for shareholders.***

As discussed in section 2.4.6. the studies of Qian and Sudarsanam (2007) and Ahn and Walker (2007) differ on whether firms that undergo a spin-off transaction have stronger or weaker corporate governance systems than their control firms. They do however, acknowledge potential value gains as a result of a spin-off transaction as an improvement in the corporate governance system is more likely. As firms with weak corporate governance system allows for more value to be wasted, the abnormal returns are expected to be higher whenever a spin-off in such a firm occurs. Several board features such as board size, the percentage of independent directors and the CEO tenure belong to a group of corporate governance variables often used to measure the monitoring effectiveness of the board (see for example Bhagat and Bolton, 2008). The following hypothesis is used to test whether specifically the monitoring effectiveness of the board has influence on the short-term abnormal performance of firms involved in a spin-off. I assume the short-term wealth effects to be greater when a firm with weak board monitoring effectiveness completes a spin-off as they are in general less likely to act in the best interest of their shareholders. This is tested with the following hypothesis:

***H6: Spin-offs with a weak board monitoring effectiveness earn higher short-term abnormal returns.***

When a larger part of a company is spun-off, a larger part of the supposedly value impeding activities are removed so that the remaining units weigh relatively more in the subsequent performance. The studies in section 2.4.8. show a positive relation between the relative size of the spin-off and the spin-off wealth effects at announcement and I believe similar result occur in the UK:

***H7: Firms who divest a relatively large part of their existing business in a spin-off earn higher announcement returns.***

## 4. Data description and methodology

### 4.1. Data sources and sample construction

This study analyses a sample of spin-offs in the United Kingdom that were announced in the period from 1987 to 2010. A UK spin-off is defined as a spin-off in which a London Stock Exchange (LSE) listed parent spins-off a unit which will also be listed on the Main Market or the Alternative Investment Market (AIM). The spin-off announcement and completion dates are gathered from the Securities Data Corporation (SDC) Merger and Acquisitions Database, as were primary SIC codes. Whenever there is uncertainty about the exact announcement date or name of the parent company, it is checked with news articles from the LexisNexis database and regulatory filings found at FE Investigate. Accounting data and stock price information were retrieved from Datastream. On the occasion that the accounting data was incomplete, it was supplemented by data from regulatory filings (i.e. annual reports) whenever possible. Also, the Orbis (Bureau van Dijk) database was used to identify matching firms. Finally, information of the firm's corporate boards were retrieved from the BoardEx database and analysts' forecast data were collected from the Institutional Brokers' Estimate System (IBES).

Several spin-offs were eliminated from the original sample for the following reasons. Firstly, when stock price data in Datastream was unavailable for the parent company or subsidiary. They were also removed, when the announcement coincided with other important financial events for the company. Finally, companies that spun-off multiple subsidiaries and subsidiaries that were spun-off by multiple parents at once were removed. In Table 3 below descriptive statistics for the sample of firms involved in a spin-off transaction as well as spin-off observations per year and industry are reported. Panel A in Table 3 indicates very high spin-off activity for the years 2000, 2001 and 2006. The distribution of spin-off activity across industries in Panel B shows a concentration around the Manufacturing, Transportation & Public Utilities, Finance, Insurance, Real Estate and Services industries for the parent as well as the spun-off firm. Finally, Panel C indicate a large variation and right skew in market values for both the parent as well as the subsidiary firm. The mean relative size of a distributed spin-off is 35%.

**Table 3.** Descriptive statistics for firms involved in spin-offs

| <b>Panel A: Spin-offs per year</b> |                    | <b>Panel B: Spin-offs per industry</b> |                    |
|------------------------------------|--------------------|----------------------------------------|--------------------|
| <i>Year</i>                        | <i>Spin-offs #</i> | <i>Industry type</i>                   | <i>Spin-offs #</i> |
| 1988                               | 2                  | <u>Parent</u>                          |                    |
| 1989                               | 6                  | Agriculture, Forestry, Fishing         | 0                  |
| 1990                               | 2                  | Mining                                 | 6                  |
| 1991                               | 2                  | construction                           | 1                  |
| 1992                               | 2                  | Manufacturing                          | 24                 |
| 1993                               | 2                  | Transportation & Public Utilities      | 15                 |
| 1994                               | 0                  | Wholesale Trade                        | 3                  |
| 1995                               | 1                  | Retail Trade                           | 9                  |
| 1996                               | 5                  | Finance, Insurance, Real Estate        | 16                 |
| 1997                               | 7                  | Services                               | 16                 |
| 1998                               | 8                  | Public Administration                  | 0                  |
| 1999                               | 5                  |                                        |                    |
| 2000                               | 12                 | <u>Spin-off</u>                        |                    |
| 2001                               | 10                 | Agriculture, Forestry, Fishing         | 0                  |
| 2002                               | 5                  | Mining                                 | 2                  |
| 2003                               | 3                  | construction                           | 3                  |
| 2004                               | 4                  | Manufacturing                          | 20                 |
| 2005                               | 3                  | Transportation & Public Utilities      | 18                 |
| 2006                               | 13                 | Wholesale Trade                        | 3                  |
| 2007                               | 8                  | Retail Trade                           | 9                  |
| 2008                               | 0                  | Finance, Insurance, Real Estate        | 14                 |
| 2009                               | 2                  | Services                               | 21                 |
| 2010                               | 4                  | Public Administration                  | 0                  |

| <b>Panel C: Market capitalization and relative size of the firms involved in spin-off</b> |               |                 |                      |
|-------------------------------------------------------------------------------------------|---------------|-----------------|----------------------|
|                                                                                           | <u>Parent</u> | <u>Spin-off</u> | <u>Relative size</u> |
| <i>Mean</i>                                                                               | 2145.11       | 692.46          | 0.35                 |
| <i>Median</i>                                                                             | 412.07        | 166.07          | 0.34                 |
| <i>Standard</i>                                                                           |               |                 |                      |
| <i>Deviation</i>                                                                          | 5542.36       | 1374.73         |                      |
| <i>Maximum</i>                                                                            | 43260.93      | 7224.8          |                      |
| <i>Minimum</i>                                                                            | 1.15          | 1.52            |                      |

The table describes the sample of 90 completed spin-offs in the UK for the period January 1987 to December 2010. Spin-off announcement and completion dates were gathered from the SDC Mergers and Acquisitions database and verified via LexisNexis database news articles or regulatory filings from Investigate. Spin-offs were removed if stock price data was unavailable in Datastream, when the announcement coincided with other important financial events for the company or more than one spin-off or parent was partaking in the spin-off event. The industries wherein parents and spin-offs are categorized in Panel B, are created following the primary two digit SIC codes. The market values in Panel C are defined in million pound sterling at completion date and the relative size is calculated as the market value of the spin-off as a ratio of the cumulative market values.

## 4.2. Variable definition

The variables described in this section are used as proxies to measure several hypotheses described section 3. Whenever accounting data is used, it is taken from Datastream or the annual report in the fiscal period prior to the spin-off announcement.

### *Corporate focus.*

To measure focus, two-digit SIC codes for parent and spun-off units are gathered from the SDC Database. The dummy variable equals 1, if the two-digit SIC code from the parent differs from the spin-off. It is zero if the two-digit SIC codes of parent and spun-off unit are equal, thus not focus-increasing.

### *Takeover interest.*

Based on the findings of Cusatis et al. (1997) and the theoretic model of Chemmanur and Yan (2004), a dummy variable that measures the takeover interest is generated. It takes the value of 1 when a merger or controlling acquisition is announced or attempted and when a large (greater than 20%) increase in equity ownership occurs in the 12 months prior to the spin-off announcement. The information is retrieved via news articles from the LexisNexis database.

### *Information asymmetry.*

To test the information asymmetry hypothesis, earnings forecast data are gathered from the Institutional Brokers Estimate System (IBES). I use the forecast error in earnings and the normalized standard deviation of forecasts to measure information asymmetry, as in Krishnaswami and Subramaniam (1999). I measure the forecast error in earnings for each firm in the sample. The year of observation is the fiscal year prior to the spin-off announcement. The predicted earnings for the last month of the fiscal year under observation are estimated by the mean monthly earnings forecast for the last month. The forecast error then, is the ratio of absolute difference between the forecasted earnings and the actual earnings per share to the price at the start of the month. The forecast error is expected to be bigger when there is more information asymmetry, as analysts' forecasts and realized earnings are expected to differ more (Christie, 1987). The other measure for the information variable, the normalized standard deviation of forecasts, measures the standard deviation of all earnings forecasts made in the last month preceding the fiscal year of the spin-off announcement divided by

the price at the start of the month. As a large variation in analysts' estimates indicates information is more complex for the firm.

#### *Board monitoring effectiveness.*

Several variables are used as a rough approximation of a firm's board monitoring effectiveness. The variables are created from the data available in the BoardEx database. Unfortunately, limited data is available for years prior to 1999 and small (AIM-listed) firms. I use board size, which counts the amount of persons on the board. Smaller boards should suggest be more effective monitors as they are less prone to free rider behavior and are more like to engage in an open dialogue (Goodstein, Gautam and Boeker, 1994; Yermack, 1996). Subsequently, board independence measures the number of independent directors as a percentage of the total board, where directors are independent if the only tie with the firm is the board directorship. The presence of relatively more independent directors suggests a better monitoring performance (Fama and Jensen, 1983; Rosenstein and Wyatt, 1990; Ezzamel and Watson, 1993). Finally, the executive tenure ratio divides the average tenure of the executive board by the average tenure of the non-executive board. It is based on the model described in Hermalin and Weisbach (1998), which measures the board's effectiveness as a function of the bargaining power of the CEO in the board selection process. A smaller ratio suggests non-executive board members are on the board relatively longer than the executive board. The CEO is then less likely to bargain. Hence, the ratio of independent directors and tenure are expected to have a negative effect on the spin-off wealth effects. The board size is expected to have a positive influence. As I expect the potential value gains are greater for firms with weak monitoring effectiveness

#### *Relative size.*

It is measured as the market capitalization of the spin-off relative to the sum of the market values of the parent and spun-off unit. As several earlier studies in section 2.4.8. find that the announcement returns are higher when a bigger proportion of assets are spun-off. It is measured on the completion date of the spin-off as this is the first day on which it has a market quotation.

### *Cluster-effect.*

To control for effects driven by the clustering of spin-offs in several periods, I create a dummy variable that is 1 when a spin-off took place in a year with an above average number of spin-off announcements and zero otherwise. The average amount of spin-offs per year is 4.6 hence, the dummy variable is 1 when five or more spin-offs per year are announced.

### *Stock market conditions.*

Two control variables are created to control for overall stock market conditions. A boom variable equals 1 if the spin-off took place in a year with top 30% returns of the FTSE all-share ex investment trusts index and is zero otherwise. Likewise, the bust variable equals 1 if the spin-off took place in a year with the lowest 25% returns. The average return in the bust years is equal to -11.6% whereas the average return in the boom years is 26.7%.

### *Growth.*

I control for a parent's growth options by including variable based on the market-to-book ratio of the parent at the end of month prior to the spin-off announcement date. The ratio is estimated as the market value of equity plus the book value of preferred stock and debt divided by the book value of equity, preferred stock and debt. As Krishnnswami and Subramaniam (1999) document that firms with higher growth opportunities are more likely to engage in spin-offs to increase information transparency. One can then assume higher wealth-effects for high growth firms, as the reduced information complexity is likely more beneficial for those firms. Thus, I expect a positive relation with wealth effects for this variable

### *Debt.*

Murray (2008) attributes the relatively low spin-off wealth effects in his UK study to the inability to transfer wealth from bondholders. To control for the monitoring strength of debt holders, a debt ratio variable was created. It is defined as the sum of the short and long-term debt of the company divided by the firm's total assets. It is likely that monitoring by debt holders increases with a higher debt ratio (Jensen, 1986). If so, more monitoring is expected to have a negative effect on the wealth effects as it becomes more difficult to transfer wealth away from debt holders to the shareholders.

### *Return on Assets.*

The return on assets (ROA) control variable, is defined as the percentage of earnings before interest divided by the average total assets of the firm for the fiscal year prior to the spin-off announcement. It is based on the finding of Krishanswami and Subramaniam (1999) that firms who require external capital are more likely to engage in a spin-off. As a spin-off improves the access to external capital in the future and improves profitability performance (Nanda and Narayan, 1999). As return on assets shows the internal cash generating capacity, parent firms with a higher value are less likely to benefit from the spin-off value effects.

### *Fixed effects.*

The reported regressions are run with controls for industry and year fixed effects. This way the unobserved effects particular to each year and industry are absorbed. Companies are categorized in industries using the two digit SIC code.

## *4.3. Methodology*

### *4.3.1. Event study methodology*

I explore several sources of short-term abnormal returns ( $AR_{i,t}$ ) that can be attributable to a spin-off announcement via the similar event study method as in Hite and Owers (1983) . Abnormal returns are measured using the OLS market-model method for security  $i$  on day  $t$ :

$$AR_{i,t} = r_{i,t} - R_{i,t} = r_{i,t} - (\hat{\alpha}_i - \hat{\beta}_i R_{m,t})$$

Where

$AR_{i,t}$  = abnormal return of security  $i$  on day  $t$

$r_{i,t}$  = raw returns of security  $i$  on day  $t$

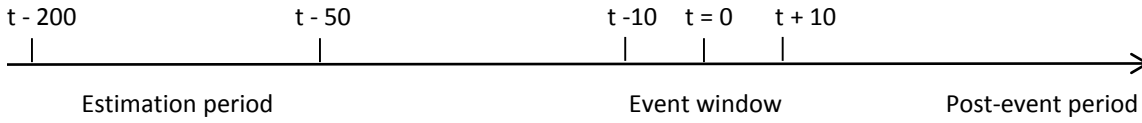
$R_{i,t}$  = market-model estimated return of security  $i$  on day  $t$

$\hat{\alpha}_i$  = market model intercept, estimated by an ordinary least squares regression

$\hat{\beta}_i$  = slope, estimated by an ordinary least squares regression

$R_{m,t}$  = raw return of the respective market index on day  $t$

$R_{i,t}$  is the normal return, the expected return of stock  $i$  on day  $t$  in the estimation period.  $\hat{\alpha}_i$  and  $\hat{\beta}_i$  are estimated using an ordinary least squares regression. The FTSE all-share ex investment trust index is used as the market index. The estimation period is from  $t = -220$  up to  $t = -20$  relative to the announcement date  $t = 0$ , figure 1 below gives a graphic overview of the event study periods.



**Figure 1: Graphic overview of the event study periods**

The short-term abnormal returns ( $AR_{i,t}$ ) for each firm are calculated for the event window  $t = -10$  up to  $t = 10$ . The average abnormal return ( $AAR_t$ ) for firms on day  $t$  in the event window is defined as:

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

Where  $N$  is the total number of parent firms in the sample. The average cumulative abnormal returns over several event window periods are calculated as follows:

$$CAR_{P1, P2} = \sum_{P1}^{P2} AAR_t$$

Where  $P_1$  and  $P_2$  are event days within the event window  $t = -10$  to  $t = 10$ . The expected value of the CAR is zero when there are no abnormal returns. Statistical significance is tested via the two-tailed t-test:

$$t = \frac{CAR_{P1, P2}}{SD(CAR_{P1, P2})}$$

Where  $SD(CAR_{P1, P2}) = SD(AAR_t) \sqrt{E2 - E1}$  and  $E2$  and  $E1$  are the end- and start-date of the estimation period.

#### 4.3.2. Long-term abnormal return methodology

To assess the effect of a spin-off on the long-term, I follow the matching-firm approach of Barber and Lyon (1997) to calculate the buy-and-hold abnormal returns (BHARs) for parents and spin-offs. It is used to test whether information is directly incorporated into stocks or has relevance over a longer period. Unlike the CAR, it incorporates the effects of compounding into measuring the returns. This method has been used in all the studies mentioned in table 2. Matching firms are assigned by selecting firms in the same industry based on market capitalization (size) and market-to-book-ratio listed in the UK. For every parent and spun-off unit, I searched for firms existing in the year of the announcement and with a similar current two-digit SIC code. After looking up the size and market-to-book ratio one month prior to the event, the firm closest on size and market-to-book ratio was selected as matching firm.

The return of stock  $i$  will then be compared with the stock return of the closest matching firm for holding periods of 180, 360 and 720 days using the following equation:

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

Where  $t$  is the first trading date after the spin-off event and  $T$  the last trading day in the period.  $R_{it}$  is the sample firm's stock return on day  $t$  and  $R_{jt}$  of the matching firm on day  $t$ . The average BHAR is then calculated as follows:

$$ABHAR_{t:T} = \frac{1}{N} \sum_{i=1}^N BHAR_{i,t:T}$$

I use the  $t$ -statistic as mentioned in Barber and Lyon (1997) to test whether ABHAR's are different from zero. It is the following:

$$t = \frac{ABHAR_{t:T}}{SD(BHAR_{t:T})/\sqrt{N}}$$

## 5. Results

### 5.1. Short-term wealth effects

The cumulative average abnormal returns (CARs) following the announcement of a spin-off for several different event windows are reported in Table 4. The results are estimated following the event study methodology as described in section 4.3.1. The results show an average CAR of 4.76% for the three-day CAR with the interval  $[-1, +1]$  which is significant at the 1% level. All intervals show positive significant average CARs with the exception of the  $[+1, +10]$  interval, which reports a slightly positive mean CAR and a negative median but no significant results. Most of the short-term wealth effects occur in the  $[-1, +1]$  interval. This is in line with the semi-strong efficient market hypothesis. As the stock price of the parent firm adjusts when the spin-off announcement is made to the public but shows no abnormal return after the public statement is made. The abnormal returns in the period prior to the spin-off announcement suggest some investors had private information as they were probably earlier aware of upcoming spin-off announcement. The estimates in Table 4 are consistent with similar previous studies<sup>11</sup> who observe short-term wealth effects for UK firms announcing a spin-off.

**Table 4.** Abnormal returns on the announcement date of 106 spin-offs

| Interval    | N   | Cumulative abnormal returns |         |         |                     |
|-------------|-----|-----------------------------|---------|---------|---------------------|
|             |     | Mean                        | T-value | Median  | Percentage Positive |
| $[-10, -1]$ | 106 | 2.19                        | 1.73*   | 0.05    | 50.00               |
| $[-1, 0]$   | 106 | 4.51                        | 3.78*** | 1.80*** | 64.15               |
| $[0]$       | 106 | 3.00                        | 3.56*** | 1.07*** | 63.21               |
| $[-1, +1]$  | 106 | 4.76                        | 3.71*** | 1.12*** | 63.21               |
| $[+1, +10]$ | 106 | 0.46                        | 0.41    | -1.09   | 44.34               |

This table shows the cumulative average abnormal return (%) (CAR) for the sample of 106 spin-off announcements by companies listed in the United Kingdom from January 1987 up to December 2010. The significance of the CAR is calculated using a two-tailed t-test and the significance of the medians is tested using a Wilcoxon signed rank test. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

<sup>11</sup> For example, the studies reported in Table 1 in section 2.3.1.

From the 106 announced spin-offs, several spin-offs 16 were withdrawn. Spin-off were withdrawn if they were double recorded, if they coincided with other important financial events for the company and the company was spun-off by more than one parent firm. In comparison with other UK studies I find less observed spin-offs in total, this is the result of not counting a spin-off announcement as an observation if no stock price data was available in DataStream. As of here, the focus is on the sample of 90 completed spin-offs to find out whether these create value. Table 5, summarizes the CARs for the sample of completed spin-offs. The mean CAR for the three-day event window equals 4.46% while the median is 0.85%. Both are significant at the 1% level and 62.21% of the cumulative abnormal returns are positive. The short-term wealth effects of announced and consequently completed spin-offs, are roughly the same as the sample including uncompleted spin-offs.

The mean CARs (interval [-1, +1]) are of a greater magnitude than the results reported by Veld and Veld-Merkoulova (2004) for their UK sample and the results in the study of Murray (2008). They report a three-day average CAR (interval [-1, +1]) of 2.41% and 1.82%, respectively. They are however a bit smaller than the average CARs reported by Qian and Sudarsanam (2007) for their UK sample (a three-day average CAR of 5.58%). The results are most likely different as the before mentioned, because the authors had different sample periods. Overall, mean CARs and Medians are positive and significant at minimum on the 5% level, except for the [+1, +10] event widow. For this interval, the mean CAR and Median are negative, although not statistically significant (-0.09% and -1.17%, respectively). This could be the result of overreaction of investors to the expected value gains the spin-off brings about.

**Table 5.** Abnormal returns on the announcement date of 90 completed spin-offs

| Interval  | N  | Cumulative abnormal returns |         |         |                     |
|-----------|----|-----------------------------|---------|---------|---------------------|
|           |    | Mean                        | T-value | Median  | Percentage Positive |
| [-10, -1] | 90 | 2.70                        | 2.00**  | 1.00**  | 54.44               |
| [-1, 0]   | 90 | 4.41                        | 3.31*** | 1.8***  | 64.44               |
| [0]       | 90 | 2.61                        | 2.89*** | 1.07*** | 62.22               |
| [-1, +1]  | 90 | 4.46                        | 3.15*** | 0.85*** | 61.11               |
| [+1, +10] | 90 | -0.09                       | -0.08   | -1.17   | 42.22               |

This table shows the cumulative average abnormal return (%) (CAR) on announcement date for the sample of 90 completed spin-offs (N) by companies listed in the United Kingdom from January 1987 to December 2010. The significance of the CAR is calculated using a two-tailed t-test and the significance of the medians is tested using a Wilcoxon signed rank test. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

The positive cumulative abnormal returns might be attributable to certain subgroups of spin-offs. In Table 6 on the page below, a cross-sectional analysis of the short-term wealth effects is presented. The CARs as measured via the event study methodology, are presented for several different subgroups.

**Table 6.** Abnormal returns on the announcement date for spin-off sub-samples

| <i>Panel A:</i> |  | <i>Increase in corporate focus</i>           |        |    | <i>No increase in corporate focus</i>       |         |    | <i>Difference</i> |         |
|-----------------|--|----------------------------------------------|--------|----|---------------------------------------------|---------|----|-------------------|---------|
|                 |  | Mean                                         | Median | N  | Mean                                        | Median  | N  | Mean              | Median  |
| CAR             |  | 5.24                                         | 0.54   | 50 | 3.49                                        | 1.48    | 40 | 1.75              | -0.94   |
| Test statistic  |  | 2.49**                                       | 2.36*  |    | 1.91*                                       | 1.88*   |    | 0.63              | -0.11   |
| <i>Panel B:</i> |  | <i>Takeover interest</i>                     |        |    | <i>No takeover interest</i>                 |         |    | <i>Difference</i> |         |
|                 |  | Mean                                         | Median | N  | Mean                                        | Median  | N  | Mean              | Median  |
| CAR             |  | 0.10                                         | -0.41  | 17 | 5.48                                        | 1.88    | 73 | -5.37             | 2.29    |
| Test statistic  |  | 0.06                                         | -0.31  |    | 3.25***                                     | 3.47*** |    | -2.24**           | 1.84*   |
| <i>Panel C:</i> |  | <i>High information asymmetry</i>            |        |    | <i>Low information asymmetry</i>            |         |    | <i>Difference</i> |         |
|                 |  | Mean                                         | Median | N  | Mean                                        | Median  | N  | Mean              | Median  |
| CAR             |  | 2.18                                         | 0.550  | 37 | 1.26                                        | 1.19    | 35 | 0.91              | -0.64   |
| Test statistic  |  | 2.05**                                       | 1.68*  |    | 1.05                                        | 1.44    |    | 0.57              | 0.01    |
| <i>Panel D:</i> |  | <i>Higher board monitoring effectiveness</i> |        |    | <i>Lower board monitoring effectiveness</i> |         |    | <i>Difference</i> |         |
|                 |  | Mean                                         | Median | N  | Mean                                        | Median  | N  | Mean              | Median  |
| CAR             |  | 2.63                                         | 0.73   | 19 | -0.49                                       | -2.26   | 17 | 3.11              | 2.99    |
| Test statistic  |  | 2.07*                                        | 1.73*  |    | -0.32                                       | -0.69   |    | 1.56              | 1.66*   |
| <i>Panel E:</i> |  | <i>Large relative size</i>                   |        |    | <i>Small relative size</i>                  |         |    | <i>Difference</i> |         |
|                 |  | Mean                                         | Median | N  | Mean                                        | Median  | N  | Mean              | Median  |
| CAR             |  | 7.74                                         | 2.29   | 45 | 1.19                                        | 0.52    | 45 | 6.55              | 1.77    |
| Test statistic  |  | 3.06***                                      | 3.35   |    | 1.06                                        | 0.77    |    | 2.37**            | -2.18** |

This table shows the three-day [-1, +1] cumulative average abnormal return (%) (CAR) for several sub-samples of the 90 completed spin-offs by companies listed in the United Kingdom from January 1987 to December 2010. An increase in corporate focus is measured by spin-offs with a two-digit SIC code that differs from the parent company. Takeover interest is a dummy that equals 1 when there were signs of increased takeover interest in the 12 months prior to the spin-off announcement. Information asymmetry is measured using the forecast error as a proxy, using the normalized standard deviation of forecasts leads to similar results with the exception of the high information asymmetry mean CAR significant at only the 10% level. The monitoring effectiveness is measured by board size. Using other proxies such as independence ratio of the board or the average tenure, no significant results are found. Relative size is measured as the market value of the spin-off as a ratio of the cumulative market of parent and spin-off at the completion date. The subgroups for information asymmetry, board monitoring effectiveness and relative size are created by being below or above the median. The significance of the CARs and difference in means is calculated using a two-tailed t-test, the significance of the medians is tested using a Wilcoxon signed rank test and the difference in medians is tested using the Mann-Whitney test statistic. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

In panel A, the short-term wealth effects of corporate focus increasing firms are compared with firms that do not increase corporate focus as a result of a spin-off. As mentioned in section 2.4.1. , several previous studies found larger abnormal returns for focus increasing firms than those who do not. The results in panel A show no such evidence. The mean cumulative abnormal return for 50 companies that increase corporate focus is 5.24% while the 40 firms which do not increase focus report a mean CAR of 3.49%. Unlike the studies in section 2.4.1.<sup>12</sup>, the difference in the means of 1.75% and medians of -0.94% are not statistically significant. Also, the median CAR of the focus increasing group equals 0.54%, which is smaller than the median of 1.48% for non-focus group. The results do not support the hypothesized relation.

The difference in CARs for firms who had signs of takeover interest in comparison to those who were not, are summarized in Panel B. The mean and median CAR for firms with a takeover interest is notably lower than those of the subsample who do not. The mean and median differences of -5.37% and 2.29% are significantly different from zero, which is opposite of my expectation.

In panel C compares the subsamples of firms with a high level of information asymmetry and firms with a low level of information asymmetry. The level of information asymmetry is measured by the forecast error in earnings. The subgroups are created by splitting the group at median. As one would expect, the firms with a higher level of information asymmetry have a higher mean CAR. However they do have a smaller median in comparison to the low information asymmetry subgroup. The difference in mean and median are also not statistically different. The results thus show no evidence of higher short-term wealth effects for spin-offs with a high level of information asymmetry. This is inconsistent with the reported effects by Krisnaswami and Subramaniam (1999) in the US. Veld and Veld-Merkoulova (2004), did also not find the expected effect in its EU study. The conclusion is similar when the normalized standard deviation of forecasts is used as a measure for the level of information asymmetry.

Panel D divides firms into two groups based on their board monitoring effectiveness, as proxied by board size. The groups are split at the median, where firms with a higher board monitoring effectiveness represent a smaller board size. Due to limited data availability in the BoardEx database, the number of observations is reduced to 36 for this variable.

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<sup>12</sup> The studies of Daley et al. (1997), Desai and Jain (1999), Veld and Veld-Merkoulova (2004) and Boreiko and Murgia (2013) perform a similar cross-sectional test.

Firms with a higher board monitoring effectiveness report a positive mean CAR of 2.63% and median of 0.73%, significant at the 10% level. Whereas the firms with lower board monitoring effectiveness report non-significant negative mean and median CARs. Only the difference in median is significant at the 10% level. When the board monitoring effectiveness is measured with the use of the independent ratio and tenure ratio no significant results are found. Overall, the results show no convincing evidence for higher abnormal returns because of a higher board monitoring effectiveness in comparison to those who do not.

Finally, Panel E indicates that when the spin-off is of a relatively large size, higher cumulative abnormal announcement returns are achieved. The mean and median CAR of the large relative size group are 7.74% and 2.29%. These are higher than the small relative size group that reports a CAR mean and median of 1.19% and 0.52%, respectively. The result is in line with the hypothesis as both the mean difference of 6.55% and the median difference of 1.77% are statistically significant.

In order to measure the single effect of every individual variable on the short-term abnormal spin-off returns, regressions of the three-day CAR with solely one variable and industry and year fixed-effects are run. The results are reported in Table 7 on the following page. The number of observations differs per variable due to limited data availability for some observations. Although the coefficient of the Corporate Focus variable indicates focus increasing companies earn higher short-term abnormal returns, the result is insignificant as was also the case in the cross-sectional analysis in Table 6. In contrast, the result of regression two for the takeover interest variable, is in line with the findings in the previous table. Takeover interest pre-spin-off has a negative impact on the short-term spin-off wealth effects. The variables that measure information asymmetry in this study: the forecast error and normalized standard deviation in analyst's earnings forecast, are not significant and show opposing signs whereas Krishanswami and Subramaniam (1999) predict significant positive signs. The measures for board monitoring effectiveness (in regression five, six and seven) are insignificant. The coefficients of board size and tenure ratio show the signs that were expected. Independent ratio, however is opposite of our expectation. The relative size variable, which was documented in the early studies of Hite and Owers (1983) and Miles and Rosenfeld (1983) has a positive relation in this analysis as well. For the control variables, I find a significantly negative effects for the cluster and bust variables, this suggests that when an above average amount of spin-offs is coming to the market and in a severe down market the wealth effects of spin-offs are diminished.

**Table 7.** Regressions of short-term spin-off wealth effects for each separate variable

| Variable                | (1)            | (2)                 | (3)              | (4)              | (5)              | (6)               | (7)            | (8)               | (9)            | (10)               | (11)                | (12)            | (13)                | (14)           |
|-------------------------|----------------|---------------------|------------------|------------------|------------------|-------------------|----------------|-------------------|----------------|--------------------|---------------------|-----------------|---------------------|----------------|
| Intercept               | 7.76<br>(0.92) | 15.89***<br>(2.53)  | 12.89*<br>(1.71) | 13.50*<br>(1.74) | -3.53<br>(-0.83) | 13.72**<br>(2.21) | 7.70<br>(1.48) | 9.401<br>(0.96)   | 3.65<br>(0.68) | 24.63***<br>(2.89) | 11.31<br>(1.37)     | 11.31<br>(1.37) | 11.31<br>(1.37)     | 4.50<br>(0.74) |
| Corporate Focus         | 5.31<br>(1.14) |                     |                  |                  |                  |                   |                |                   |                |                    |                     |                 |                     |                |
| Takeover interest       |                | -9.22***<br>(-2.89) |                  |                  |                  |                   |                |                   |                |                    |                     |                 |                     |                |
| Forecast error          |                |                     | -5.77<br>(-0.06) |                  |                  |                   |                |                   |                |                    |                     |                 |                     |                |
| Norm. Stdev             |                |                     |                  | 71.25<br>(0.54)  |                  |                   |                |                   |                |                    |                     |                 |                     |                |
| Board size              |                |                     |                  |                  | 0.37<br>(0.99)   |                   |                |                   |                |                    |                     |                 |                     |                |
| Tenure ratio            |                |                     |                  |                  |                  | -0.56<br>(-0.56)  |                |                   |                |                    |                     |                 |                     |                |
| Independent ratio       |                |                     |                  |                  |                  |                   | 6.58<br>(1.21) |                   |                |                    |                     |                 |                     |                |
| Relative size           |                |                     |                  |                  |                  |                   |                | 19.23**<br>(2.46) |                |                    |                     |                 |                     |                |
| Debt to Assets          |                |                     |                  |                  |                  |                   |                |                   | 0.22<br>(1.51) |                    |                     |                 |                     |                |
| ROA                     |                |                     |                  |                  |                  |                   |                |                   |                | -0.17<br>(-0.69)   |                     |                 |                     |                |
| Cluster-effect          |                |                     |                  |                  |                  |                   |                |                   |                |                    | -14.26**<br>(-1.72) |                 |                     |                |
| Boom                    |                |                     |                  |                  |                  |                   |                |                   |                |                    |                     | 6.25<br>(0.68)  |                     |                |
| Bust                    |                |                     |                  |                  |                  |                   |                |                   |                |                    |                     |                 | -12.65**<br>(-2.00) |                |
| Price to Book           |                |                     |                  |                  |                  |                   |                |                   |                |                    |                     |                 |                     | 0.21<br>(0.80) |
| N                       | 90             | 90                  | 72               | 68               | 36               | 35                | 36             | 90                | 87             | 84                 | 90                  | 90              | 90                  | 88             |
| R <sup>2</sup>          | 0.284          | 0.310               | 0.410            | 0.441            | 0.67             | 0.658             | 0.673          | 0.319             | 0.313          | 0.329              | 0.259               | 0.259           | 0.259               | 0.267          |
| Adjusted R <sup>2</sup> | -0.044         | -0.007              | 0.026            | 0.039            | 0.32             | 0.316             | 0.327          | 0.007             | -0.018         | 0.005              | -0.063              | -0.063          | -0.063              | -0.080         |

Regressions with industry and time fixed effects for the three-day [-1, +1] cumulative average abnormal return (%) (CAR) of 90 completed spin-offs listed in the United Kingdom from January 1987 to December 2010. Corporate focus equals 1 if the two-digit SIC code differs from the parent company. Takeover interest equals 1 when there were signs of increased takeover interest in the 12 months prior to the spin-off announcement. Forecast error is the ratio of absolute difference between forecasted and actual earnings per share to the price at the start of the last month in the fiscal year prior to the announcement. The normalized standard deviation of forecasts (Norm. Stdev), equals the standard deviation of earnings forecasts made in the last month preceding the fiscal year of the spin-off divided by the price at the start of the month. Board size is the number of people on the board. Independent ratio is the number of independent directors to the total board. Tenure ratio equals the average tenure of the executive board by the average tenure of the non-executive board. Relative size is measured as the market value of the spin-off as a ratio of the cumulative market of parent and spin-off at the completion date. The significance of the CARs and difference in means is calculated using a two-tailed t-test, the significance of the medians is tested using a Wilcoxon signed rank test and the difference in medians is tested using the Mann-Whitney test statistic. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

In the next table (Table 8 on page 38), multivariate regressions with year- and industry fixed-effects are reported in order to explain the sources of value creation following the announcement of a spin-off. Beforehand, variables were checked for multicollinearity using the Pearson's correlation test. A high correlation was found between the proxies which should measure the same variables. For example, the normalized standard deviation of analysts' forecasts and the forecast error had a correlation of 0.50. The proxies for the board monitoring effectiveness show similar correlations between each other except for the negative correlation of -0.18 between board size and the tenure ratio. Overall, the board monitoring effectiveness proxies have a notable correlation, either positive or negative, with the control variables.

The regression results in Table 8, have taken into account the multicollinearity concerns. The reported regressions are chosen in such a way, that they show all relevant evidenced effects while limiting increases in the variances of the regression coefficients. As such highly correlated independent variables are substituted by other proxies if possible and sometimes even completely removed. Whenever similar effects were evidenced with less variables, the regression with the most explanatory variables is documented. Despite the efforts to reduce redundancy among the predictors (as a result of chasing the same variance in the CAR), the adjusted R-squared's of the regressions describe little of the variability in wealth effects. The sample size may differ as some data is not available for all variables. As the sample size for the regressions with board monitoring effectiveness variables is notably low, it is possible that the results are due to overfitting of variables and are in reality just a spurious relationship.

The results show a positive relation with short-term abnormal return when a firm decides to increase its corporate focus in a spin-off transaction. Only when a board monitoring effectiveness proxy is added does the sign turn slightly negative. Nevertheless, the observed effect is just as in the previous analyses insignificant.

The unexpected negative effect of takeover interest pre-spin-off on the short-term average cumulative abnormal return is also evidenced in these multivariate regressions. Depending on the amount of variables added to the regression, the effect varies from -9.17% to -5.59% for the regressions with a reasonable sample size. Only in the small sample size regressions, where a board monitoring effectiveness variable is added, the effect is insignificant.

Since the effect of takeover interest is again opposite of what was hypothesized, I inspected several news articles of companies who demonstrated takeover interest prior to the spin-off announcements in order to come up with a potential reason behind this effect. The following passage provides a good insight to what was evidenced in several of the news articles:

“There was nothing unexpected or compelling about chief executive Chris Masters' announcement that Salvesen was demerging Aggreko, its equipment hire business, and would pay pounds 150m in special dividends. Far from adding value, the news left Salvesen shares 4 per cent colder at 313p. ( ... ) Institutions were said to be un-excited by the restructuring package, with several still incensed that Salvesen rejected the Hays deal before it had had a chance to examine the details.” (Ahmad, 1996, p.20)

A potential reason for the opposite effect could be that investor in general bid up the shares when there is takeover interest. They expect to benefit from the situation by capturing the takeover premium. When a spin-off is then announced it is likely that the anticipated takeover will not occur anymore. As a consequence, investors have to readjust their expected returns as they receive no takeover premium.

The signs of the forecast error factor alter per regression, with coefficients of a larger magnitude when negative. Just like in the previous analyses the impact is insignificant and thus gives no convincing evidence for higher spin-off abnormal returns when firms exhibit a higher level of information asymmetry. In the regression table below, it is measured using the forecast error as a proxy, but similar results occur when the normalized standard deviation of analyst forecasts is used.

The results indicate that relative size contributes positively to the short-term wealth effects associated with spin-offs. In the cross-sectional analysis above and in the regressions for each variable separate, the relative size of a spin-off is evidenced to have a significant effect on the value created as a result of a spin-off announcement. In Table 8 however, the observed positive effect is insignificant and even negative when board monitoring variables are added. It is interesting to note that when similar regression as those reported in Table 8 are run without year and industry fixed effects, the positive effect of the relative size variable becomes highly significant just as in the previous two analyses and the statistical power associated with the takeover interest variable is reduced<sup>13</sup>.

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<sup>13</sup> Test statistics varying from -1.40 up to -2.25.

**Table 8.** Regressions of short-term wealth effects for parent firms

| Variable                | (1)                 | (2)                | (3)                 | (4)                | (5)                | (6)                | (7)               | (8)               | (9)               |
|-------------------------|---------------------|--------------------|---------------------|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|
| intercept               | 12.35**<br>(2.02)   | 13.90**<br>(2.09)  | 6.49<br>(1.20)      | 11.95**<br>(2.12)  | 6.94<br>(1.12)     | 6.49<br>(1.20)     | -5.68<br>(-1.58)  | -8.56<br>(-0.78)  | 2.20<br>(0.27)    |
| Corporate Focus         | 5.26<br>(1.16)      | 0.68<br>(0.26)     | 0.06<br>(0.02)      | 0.29<br>(0.11)     | 0.19<br>(0.07)     | 0.06<br>(0.02)     | -0.82<br>(-0.35)  | -0.66<br>(-0.23)  | -1.32<br>(-0.51)  |
| Takeover interest       | -9.17***<br>(-2.83) | -5.61**<br>(-2.56) | -5.59***<br>(-2.52) | -5.44**<br>(-2.44) | -5.39**<br>(-2.37) | -5.59**<br>(-2.52) | 0.76<br>(0.16)    | 0.32<br>(0.07)    | 1.48<br>(0.48)    |
| Forecast error          |                     | -36.76<br>(-0.41)  | 2.26<br>(0.02)      | -25.72<br>(-0.23)  | 2.71<br>(0.02)     | 2.26<br>(0.02)     |                   | -55.44<br>(-0.17) | -45.79<br>(-0.19) |
| Relative size           |                     | 6.79<br>(0.88)     | 10.03<br>(1.07)     | 6.44<br>(0.79)     | 9.87<br>(1.06)     | 10.03<br>(1.07)    | -10.96<br>(-1.30) | -11.17<br>(-1.11) |                   |
| Tenure ratio            |                     |                    |                     |                    |                    |                    | 1.27<br>(0.67)    |                   |                   |
| Independent ratio       |                     |                    |                     |                    |                    |                    |                   | 1.59<br>(0.27)    |                   |
| Board size              |                     |                    |                     |                    |                    |                    |                   |                   | 0.32<br>(0.61)    |
| Debt to Assets          |                     |                    | 0.09<br>(1.14)      |                    | 0.09<br>(1.06)     | 0.09<br>(1.14)     | 0.07<br>(0.96)    |                   |                   |
| ROA                     |                     |                    | -0.04<br>(-0.27)    | -0.027<br>(-0.21)  |                    | -0.04<br>(-0.27)   | 0.23*<br>(1.97)   | 0.17<br>(1.28)    |                   |
| Price to Book           |                     |                    | 0.22<br>(1.39)      | 0.15<br>(1.10)     | 0.21<br>(1.45)     | 0.22<br>(1.39)     | -0.27<br>(-1.54)  |                   |                   |
| Boom                    |                     |                    |                     | -10.87<br>(-1.54)  |                    |                    |                   |                   |                   |
| Bust                    |                     |                    |                     |                    | -1.46<br>(-0.36)   |                    |                   |                   |                   |
| Cluster-effect          |                     |                    |                     |                    |                    | -7.43<br>(-1.12)   | 28.11**<br>(2.41) | 26.67*<br>(1.90)  |                   |
| N                       | 90                  | 72                 | 68                  | 68                 | 70                 | 68                 | 33                | 30                | 31                |
| R <sup>2</sup>          | 0.335               | 0.502              | 0.554               | 0.532              | 0.523              | 0.554              | 0.888             | 0.845             | 0.794             |
| Adjusted R <sup>2</sup> | 0.013               | 0.115              | 0.121               | 0.104              | 0.085              | 0.121              | 0.600             | 0.358             | 0.382             |

Regressions with industry and time fixed effects for the three-day [-1, +1] cumulative average abnormal return (%) (CAR) of 90 completed spin-offs listed in the United Kingdom from January 1987 to December 2010. Corporate focus equals 1 if the two-digit SIC code differs from the parent company. Takeover interest equals 1 when there were signs of increased takeover interest in the 12 months prior to the spin-off announcement. Forecast error is the ratio of absolute difference between forecasted and actual earnings per share to the price at the start of the last month in the fiscal year prior to the announcement. The normalized standard deviation of forecasts (Norm. Stdev), equals the standard deviation of earnings forecasts made in the last month preceding the fiscal year of the spin-off divided by the price at the start of the month. Board size is the number of people on the board. Independent ratio is the number of independent directors to the total board. Tenure ratio equals the average tenure of the executive board by the average tenure of the non-executive board. Relative size is measured as the market value of the spin-off as a ratio of the cumulative market of parent and spin-off at the completion date. The significance of the CARs and difference in means is calculated using a two-tailed t-test, the significance of the medians is tested using a Wilcoxon signed rank test and the difference in medians is tested using the Mann-Whitney test statistic. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

## 5.2. Long-term wealth effects

Table 9 on the following page reports the long-term abnormal returns of spin-offs who completed a spin-off. The results are derived following the buy-and-hold abnormal return (BHAR) methodology. The abnormal returns are created as the difference between the annualized company return and the control firm. The selection method for control firms is described in section 4.3.2. Due to inability to find a control firm for every firm, the number of observations is reduced from 90 to 64 for the parents, 63 for the spin-offs and 59 for the pro-forma combined firm. Both equal-weighted and value-weighted returns are presented. The motive for value-weighted returns is that they represent more accurately the wealth effects acquired by investors (Fama, 1998). The equal-weighted returns on the other hand, brings out more clearly the long-term wealth effects to be expected from a random spin-off distribution.

Panel A shows the mean long-term abnormal returns for the parent firms. The firms underperform their matched peers in all stages except the 720 days timespan for the equal-weighted basket. The results however, are insignificant in the equal-weighted basket and only -16.67% for the 360 period is significant at the 5% for the value-weighted returns.

The findings are opposite of the previous equal-weighted return studies as described in Table 2. They show positive returns but only the findings parent BHARs of Cusatis et al. (1993) are significant. However, using the cumulative average abnormal return and also the two factor model over a period of 250 days relative to the spin-off date, Murray (2008) also finds negative returns for spin-offs in the UK.

In panel B, long-term abnormal returns for the spin-offs are reported. Only insignificant results are found for the equal-weighted basket whereas the value-weighted returns show a mean BHAR of -6.73% for the 180 day period and a large outperformance of 25.13% for spin-offs in 720 days after the spin-off distribution. The 180-day return is significant at the 10% level and the 720-day abnormal return is significant at the 5% level. Only the US studies in Table 2 report significant positive long-term abnormal returns for spin-offs, whereas EU and UK studies find similar insignificant positive returns as mine. The 720-day value-weighted spin-off return is completely opposite of the significant -22.04% reported by Veld and Veld-Merkoulova (2004). This is presumably the result of a large spin-off that delivers positive returns in this sample while in their study such a subsidiary delivered negative returns of a large magnitude.

**Table 9.** Long-term wealth effects of parent, spin-off and pro-forma combined firms

|                                          | <i>Number of<br/>observations</i> | <i>Equal-weighted</i> |                 | <i>Value-weighted</i> |                 | <i>Percentage<br/>Positive</i> |
|------------------------------------------|-----------------------------------|-----------------------|-----------------|-----------------------|-----------------|--------------------------------|
|                                          |                                   | Mean                  | <i>t</i> -value | Mean                  | <i>t</i> -value |                                |
| <i>Panel A: Parent firms</i>             |                                   |                       |                 |                       |                 |                                |
| t to t + 180                             | 64                                | -4.88                 | -1.05           | -8.29                 | -1.57           | 35.94                          |
| t to t + 360                             |                                   | -6.77                 | -1.04           | -16.67**              | -2.45           | 34.38                          |
| t to t + 720                             |                                   | 3.71                  | 0.22            | -13.52                | -1.56           | 28.13                          |
| <i>Panel B: Spin-offs</i>                |                                   |                       |                 |                       |                 |                                |
| t to t + 180                             | 63                                | -0.49                 | -0.09           | -6.73*                | -1.78           | 44.44                          |
| t to t + 360                             |                                   | 4.08                  | 0.49            | -3.21                 | -0.47           | 39.68                          |
| t to t + 720                             |                                   | 8.39                  | 0.77            | 25.13**               | 2.02            | 49.21                          |
| <i>Panel C: pro-forma combined firms</i> |                                   |                       |                 |                       |                 |                                |
| t to t + 180                             | 59                                | -4.93                 | -1.25           | -7.92*                | -1.95           | 37.29                          |
| t to t + 360                             |                                   | -4.15                 | -0.73           | -12.88**              | -2.33           | 35.59                          |
| t to t + 720                             |                                   | 1.73                  | 0.16            | -1.66                 | -0.20           | 44.07                          |

This table shows the Buy and Hold abnormal returns (%) (BHARs) for the sample of 106 spin-off announcements by companies listed in the United Kingdom from January 1987 up to December 2010. Pro-forma combined firms are created by taking the weighted return of the parent and of the spin-off by the combined equity market value of the two at completion date. For the equal-weighted return, every observation has an equal weight, whereas for the value-weighted return the BHARs are weighted by market values of equity on the completion date. t is the spin-off completion date and t + 180 (360, 720) is the amount of days after the spin-off completion. The significance of the BHARs is calculated using a two-tailed t-test. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

In panel C the long-term abnormal returns are posted as if an investor would hold both the spin-off and the parent from distribution onwards. These returns of the pro-forma combined firm, are generated by weighting the returns of the parent and spin-off firm by the combined market value of equity at the completion date. The mean equal-weighted returns for the combined firm are all insignificant. This is similar to the insignificant results posted for the EU and UK studies and the most recent US study in Table 2. The signs are the same as the parent firm's because they have a larger weight in the combined firm return in general. The value-weighted return shows significant negative abnormal returns of -7.92% and -12.88% for the 180-day and 360-day period, respectively. From the equal-weighted returns, it can be concluded that investors as a whole price spin-offs correctly on the long-term. Although value-weighted returns give some significant results, signs flip between tenures and are completely opposite of the value-weighted results found in the study of Veld and Veld-Merkoulova (2004). As one could see those results as an out of sample test, the results seem more the outcome of chance instead of causality.

To assess the relationship of several variables on the long-term wealth effects of parent firms who spun-off a subsidiary regression are run on the 360- and 720-day BHARs. The results are reported in Table 10 below. Since the focus is on long-term results, the results of the 180-day regressions are not reported. The number of observations is diminished from 64 to 53 in regression one and three because the information asymmetry variable was not available for every parent firm.

Unlike Cusatis et al. (1993) and Desai and Jain (1999) no significant positive relation for focus increasing parent firms is found, as is also the case in the EU study of Veld and Veld-merkoulova (2004). The test-statistics report low values in all regression models, which was also the case for the short-term wealth effects.

The results for the takeover interest variable shows a negative sign in all regressions, similar to what was found for the effect of takeover interest on the short-term wealth effects and in the cross-sectional analysis. It is however inconsistent with the hypothesis. It could be that as a result of the earlier signs of a takeover investors expect more of such firms in either performance or a takeover bid, shares are more bid up. As a spin-off occurred, it is likely that this is done as an alternative to the takeover that did not come to pass. It is possible that investors than slowly adjust their expectations of operational improvements downward because the results of re-incentivized management as described in the theoretical model of Chemmanur and Yan (2004) do not come to pass.

The forecast error coefficient, which measures the level of information asymmetry, is highly negative and significant at the 10% level in both the 360- and 720-day regressions without control variables. This is unlike the insignificant negative relation Veld and Veld-Merkoulova (2004) report for their information asymmetry variables. However, if the normal standard deviation of analyst earnings forecast is used as a measure for information asymmetry my results also become insignificant. The highly negative effects in the whole regression for the information asymmetry coefficients are more muted as they initially appear, since increases in the variable occur in very small fractions<sup>14</sup>. When adding controls, the control variable price to book provides the significant positive effect. It seems to absorb the effects of the information asymmetry variable. Krishnaswami and Subramaniam (1999) found that high growth firms are more likely to engage in spin-offs. The regressions suggest it is mostly the high growth firms, perhaps because of a reduction in complexity, who reap the long-term benefits of a spin-off.

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<sup>14</sup> The standard deviation of the forecast error variable equals 0.009

The positive effect of the relative size of a spin-off, which was also the case on the short-term wealth effects in the sample, show no significance for long-term wealth effects. Thus the distribution of a relatively large spin-off in comparison to the combined firm, has a little influence on the long-term performance of the parent firm.

Results for regressions of long-term performance including board monitoring effectiveness variables are not reported. When checking for the influence of such variables, no significant results were reported. This could be the result of the small amount of observations (at most 27) for which a board monitoring effectiveness proxy is available.

**Table 10.** Regressions of long-term wealth effects for parent firms

|                         | <i>360 days</i>      |                     | <i>720 days</i>       |                     |
|-------------------------|----------------------|---------------------|-----------------------|---------------------|
| variable                | (1)                  | (2)                 | (3)                   | (4)                 |
| Intercept               | 41.08<br>(0.82)      | -165.11<br>(-1.23)  | -3.56<br>(-0.02)      | -375.08*<br>(-1.79) |
| Corporate Focus         | 11.72<br>(0.40)      | -12.96<br>(-0.67)   | 49.42<br>(0.83)       | 7.92<br>(0.16)      |
| Takeover interest       | -6.88<br>(-0.26)     | -32.23<br>(-1.19)   | -107.20<br>(-1.22)    | -175.26<br>(-1.63)  |
| Forecast error          | -7205.46*<br>(-1.90) | -4642.41<br>(-1.52) | -16496.01*<br>(-1.93) | -13205<br>(-1.73)   |
| Relative size           | 45.74<br>(0.75)      | 55.33<br>(0.97)     | 279.83<br>(1.40)      | 292.73<br>(1.26)    |
| Debt to Assets          |                      | 1.41<br>(1.68)      |                       | 2.36<br>(1.10)      |
| ROA                     |                      | -0.99<br>(-0.62)    |                       | -0.04<br>(-0.01)    |
| Price to Book           |                      | 7.83**<br>(2.49)    |                       | 16.85**<br>(2.61)   |
| N                       | 53                   | 50                  | 53                    | 50                  |
| R <sup>2</sup>          | 0.428                | 0.658               | 0.569                 | 0.712               |
| Adjusted R <sup>2</sup> | -0.239               | 0.118               | 0.065                 | 0.257               |

Regressions with industry and time fixed effects for the parent 360-day and 720-day Buy-and-Hold Abnormal returns (%) (BHARs) of 53 completed spin-offs listed in the United Kingdom from January 1987 to December 2010. Corporate focus equals 1 if the two-digit SIC code differs from the parent company. Takeover interest equals 1 when there were signs of increased takeover interest in the 12 months prior to the spin-off announcement. Forecast error is the ratio of absolute difference between forecasted and actual earnings per share to the price at the start of the last month in the fiscal year prior to the announcement. Relative size is measured as the market value of the spin-off as a ratio of the cumulative market of parent and spin-off at the completion date. The significance of the BHARs is calculated using a two-tailed t-test. Significance levels are indicated by \* at the 10%, \*\* at the 5% and \*\*\* at the 1% level.

## 6. Conclusions and suggestions for future research

In this study the wealth effects of corporate spin-offs in the UK are studied. Previous research into the sources of wealth effects for spin-offs is mostly based on US data or on Europe as a whole. The number of studies devoting special attention to the UK is rather sparse. There is however reason to believe that the wealth effects in the UK may be different from those in the US and EU. The legal origin and relative size of the equity market suggest the UK bears a greater resemblance to the US, whereas the strong creditor rights and dependence on bank debt strongly refute this. This paper analyzes the short- and long-term wealth effects for a sample of 90 completed spin-offs for the period 1987 up to 2010.

Similar to previous studies, I find that companies who announce (and complete) a spin-off on average generate positive abnormal returns on the announcement date. The cumulative abnormal return for the 90 completed spin-offs in this study equals 4.46% for a three-day interval. No convincing evidence for long-term wealth effects as a result of a completed spin-off are found. The long-term abnormal returns seem to be the result of chance and thus correspond with the efficient market hypothesis.

In contrast to US research, an increase in corporate focus is not related to positive short-term wealth effects. Also, the level of information asymmetry does not seem to contribute to the short-term abnormal returns. I find a positive impact of the relative size of a spin-off on the short-term value gains in a cross-sectional analysis and in a regression of the separate variable. However, the effect disappears when more variables are added. The board monitoring effectiveness has no relation on the value effects of a spin-off announcement.

Unlike what I expected for the takeover interest hypothesis, prior takeover interest is found to have a significant negative impact on the abnormal performance of a spin-off announcement. Following an inspection of the newspaper articles of companies who demonstrated takeover interest prior to the spin-off announcements, I believe this to be the result of investors readjusting their expected returns as they assume no more takeover premium when a spin-off is announced.

Overall, the findings show a positive short-term wealth effect is also existent in the UK but other sources than those previously found in the US or Europe as a whole determine the short-term wealth effects surrounding UK spin-offs. Long-term wealth effects as a result of a spin-off are inapparent. However, the conclusions may be limited to this sample of UK firms as unavailability of data for some variables drastically reduced the number of

observations on which an analysis could be performed. Another limitation is that the variables used in this research to measure board monitoring effectiveness may not be the most refined variables to test the effect. They were also only available for a limited amount of firms. Finally, the sources for the wealth effects analyzed in this study were selected through a combination of relevance and data availability. It could be that some of the relevant factors explaining spin-off announcement abnormal returns in the literature review, would have a significant impact on UK short-term wealth effects.

This research is one of the first to study the sources of short-term wealth effects associated with a spin-off announcement in the UK. Further research can examine whether other factors that were found in the US or Europe as a whole to have an influence on the short-term wealth effect. Another interesting subject for further research is the factors that have an influence on the decision to announce a spin-off in the UK. Finally, as the negative takeover interest effect found in this study has not been tested and found before, it can be further investigated.

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