Wealth Effects and Operating Performance of Spin-Offs: International Evidence

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Abstract

This paper investigates the wealth effects of 239 spin-off announcements that took place between January 2000 and December 2009 in the USA and Europe. First, we explore the short-term stock price behavior of firms announcing a spin-off. We also analyze whether industrial and geographical diversification creates wealth effects for firms deciding to detach business activities. In a second stage, the operating performance of parent firms and their subsidiaries is investigated in the pre- and post-spin-off period. The results reveal a strong positive market reaction of 3.47% on the spin-off announcement date. However, the share price reaction differs when US and European spin-off deals are considered. The US spin-offs seem to send stronger signals to the market compared with the European spin-offs. Consistent with previous studies, we find that firms disposing unrelated businesses (industrial focus) reap significant abnormal returns. On the other hand, geographical focus seems to convey neutral signal to the market producing insignificant abnormal returns. The operating performance dramatically deteriorates in the post spin-off period for parent firms. Unlike to US parent firms, European parents increase the level of capital expenditure in the year of the spin-off and the subsequent years. Regression analysis confirms that industrial focus, relative size and operating performance play significant role in explaining abnormal returns at the announcement date.

Keywords: Spin-offs, abnormal returns, event study, industrial focus, operating performance.

1. Introduction

In the last decades there was a considerable increase in the number of mergers and acquisitions (M&A's) deals around the world. Synergies, economies of scale, better efficiency, businesses alignment and access to more diversified markets are some of the reasons cited for the lure of M&A's. However, there is a relatively recent trend to divest company's operating activities either by splitting off companies or by making independent subsidiaries and activities. The last type of divestments is known as a spin-off.

A spin-off is a transaction that involves the distribution of shares of a firm's subsidiary to the shareholders of the parent company. The shares are distributed in proportion to the shareholders' current holdings of the parent's shares in a pro-rata basis. After the spin-off, the shareholders of the parent company also hold shares of the subsidiary (spun-off) firm which trades as an independent company. Note that the spin-off transaction does not involve cash exchange.

Spin-offs can generate benefits to the firms involved as they can induce tax benefits for the parent firm, mitigate the overhead and agency costs as well as forward the more efficient use of the company's assets, which can lead to a greater operating performance (improvement of the parent's management incentives). These benefits result in the creation of wealth effects for the parent firm at the announcement date of the spin-off (Cusatis et al., 1993). Miles and Rosenfeld (1983) attributed the firm's value increase following a spin-off, to the elimination of negative synergies as well as to the improvement of the investment decisions, as the capital may be misallocated before the spin-off event. Furthermore, McConnell and Ovchinnikov (2004) asserted that before the spin-off, either some valuable resources of the subsidiary may be allocated away from the division, or the assets of the subsidiary firm are undervalued by the stock market. Therefore, once a spin-off occurs and the subsidiary begins to trade as an independent firm, no misallocation of resources is possible, while the stock market "assigns a new, and hopefully correct, value to company's assets" (McConnell et al., 2001).

In this study we investigate the value and performance implications of spin-offs that took place in Europe and USA for the period from 2000 to 2009. The objective of our study presents several dimensions. First, we assess the stock price response of parent firms to the announcement of spin-offs. Second, we measure the long-run performance of parent companies involved in a spin-off transaction. Third, we examine the long-run market performance of both the seller firm

(the parent company) and the target firm (the subsidiary) in the post-spin-off period. Fourth, we analyse the differential market reaction of those firms that diversify their spin-off activities (focused versus non-focused spin-offs) and those that alter business location. Finally, we perform a multivariate regression analysis in order to detect the factors that explain the wealth effects emanating from spin-off transactions.

The use of spin-offs as a divestiture vehicle varies widely across different countries. A possible reason for that lies in the regulatory and fiscal restrictions. For instance, in the United States, spin-offs usually do not have tax implications or other legal barriers. On the other hand, in some European countries (e.g. Netherlands, Denmark etc.) regulation and taxation may hinder spin-off transactions (Veld and Veld-Merkoulova, 2008). In the light of the differential tax treatment and barrier constraints observed in various countries, we conduct a multi-country research on the wealth effects of spin-offs that took place in the US and in some European countries. Moreover, we opt for investigating spin-offs in selected Western European countries (e.g. United Kingdom, Italy, Sweden, Belgium, Norway, France, Germany, Ireland, Portugal, Austria and Netherlands) since the underlying markets have recently become popular for spin-off activity and comparing these results with those in the US market which has a long record of spin-off transactions. We believe that our study contributes to the pertinent literature by investigating spin-offs in a market (Western Europe) that has attracted much less academic attention compared to the US one.

The rest of the paper is structured as follows. In Section 2 we discuss the literature review, in Section 3 the sample selection and descriptive-summary statistics are provided. Section 4 includes the methodology for the short- and long-term performance, together with the cross-sectional regression analysis. Section 5 presents the main empirical findings. Finally, Section 6 provides a summary and conclusions.

2. Prior Literature

Since the seminal study of Simon (1960), there is an extensive research regarding the value relevance of spin-offs. Most of these studies reveal considerable wealth effects for parent firms and their shareholders both in the short – and long-term. Several explanations for the enhancement of firm value in response to spin-off announcements have been proposed. Wealth transfers from bondholders to shareholders, tax benefits, management efficiency, corrections of

prior acquisition mistakes, investor psychology, corporate control are some of the explanations cited (Wheatley et al. 2005). Next, we refer to some of these studies that have investigated the value relevance of spin-offs around the world.

Hite and Owers (1983) examined the security price reaction of 123 spin-offs announced between 1963 and 1981 in the US market. They found that the cumulative excess returns (CARs) for the event period that commences fifty (-50, 0), four (-4, 0) and (-1, 0) one days prior to the spin-off announcement are statistically significant at the 1% level. They also examined the relation between the excess returns and the size of spin-offs. They found that large spin-offs, based on the equity value, induce higher abnormal returns compared to small-sized spin-offs. In addition, they found that when the spin-off event is a response to regulatory or potential anti-trust intervention this may lead to negative returns.

Miles and Rosenfeld (1983) examined the effect of 55 spin-off events on shareholders' wealth between 1962 and 1980. The mean adjusted return model gave an average abnormal return of 2.5% on day +1, statistically significant at the 1% level, while the cumulative average abnormal return for the intervals (-10, +10) and (-1, +1) was 7.64% and 3.34%, respectively. Furthermore, the authors attempted to test whether the spin-off size affects abnormal returns. Splitting their sample into two sub-samples of large and small spin-offs, they found that the sample of large spin-offs elicit greater stock price increases and shareholder wealth compared with the sample of small spin-offs.

Cusatis et al. (1993), using a sample of 146 non-taxable U.S. spin-offs over the period 1965-1988, found that the parent and the combined firms experienced significantly positive abnormal returns for up to 3 years after the spin-off announcement date, where the matched-firm adjusted returns for the 2- and the 3-year period were positive and statistically significant at the 5% level (25% and 33.6%, respectively). Moreover, the raw returns for the corresponding years were 52% and 76%, respectively, both statistically significant at the 1% level. Cusatis et al. (1993) also reported that spin-off transactions can increase the possibility that both the parent and the spun-off unit being taken over, while they can be used to transfer control of corporate assets to the acquiring firms.

Daley et al. (1997) examined 85 spin-offs that took place during the period 1975 – 1991 in the US market. They focused their attention on the operating performance and value creation arising from the cross-industry spin-offs (focus-increasing spin-offs), where the parent and the

spun-off firms belonged to different two-digit Standard Industry Classification code (SIC code). They found statistically significant unadjusted median changes in the ROA ratio (3.0%) between the pre- and post-spin-off years (-1, +1) for the cross-industry spin-offs and non-significant changes in the ratio of capital expenditures to sales for the same time period. Regarding the own-industry spin-offs, the results demonstrated statistical insignificance for the capital expenditures to sales and ROA ratios for the (-1, +1) year interval, but statistical significance of the latter ratio for the intervals of (-1, 0) and (+1, +2) (-2.5% and 0.9%, respectively). Finally, Daley et al. (1997) checked for median differences in the book leverage and dividends per share ratio. They found statistically significant median changes for the book leverage ratio for the years +1 and +2.

Desai and Jain (1999), using a sample of 155 U.S. spin-off transactions from 1975 until 1991, showed that the focus-increasing spin-offs (firms that diversify their business) exhibit more value in the short- and long-run than the non-focus increasing spin-offs (own-industry spin-offs). In specific, for a 3-day period around the announcement date (-1, +1), the abnormal returns for the focus increasing sample were 4.45%, vis-à-vis 2.17% for the non-focus increasing sample. Desai and Jain (1999) extended their research by studying the pre- and post-spin-off operating cash flow to total assets ratio for the (-3, +3) year interval). The results posited a statistically significant improvement in the operating performance of the focus-increasing firms compared to their matching firms. Moreover, using cross-sectional regression analysis they found a positive relation between operating performance and change in focus. In addition, they reported abnormal returns to be positively associated with the change in focus in the announcement period.

McConell et al. (2001) examined the existence of long-term excess returns for parent firms and spun-off entities after a spin-off event. Relying on Cusatis et al. sample selection steps, they ended up with 146 spin-offs which occurred between 1989 and 1995. Their returns were compared against three benchmarks; (1) size- and industry- matched stocks, (2) portfolios of stocks matched on size and book-to-market equity ratios, and (3) the Fama and French (1993) three-factor model for various intervals up to 36 months following the spin-off event. The results showed an abnormal return of 5.1% (-20.9%) for parent firms (subsidiaries) up to 36 months after the spin-off deal. For the 24-months post- spin-off period, the average excess return was 19.2% for parent firms and 5.8% for subsidiaries.

Huson and MacKinnon (2003) analyzed the effects of 84 corporate spin-offs on the corporate information environment during the period from 1984 to 1994. The authors hypothesized that a change in the corporate information environment linked with focusing spin-offs can benefit well informed traders at the expense of uninformed traders. Moreover, their research showed an increase in the residual return variances and trading costs following the spin-off transaction. The results for the increased trading costs and price impact of trades are stronger for the focus-increasing spin-offs that dispose different business units which results in the increase of shareholders' information asymmetry.

Mehrota et al. (2003) examined financial leverage differences of 98 spin-offs occurred in the period from 1979 to 1997. In particular, they found that the mean and median leverage ratios for both parent and subsidiary firms are statistically insignificant for the year prior the spin-off. Similarly, the mean and median of cash and equivalents to assets ratio are also statistically insignificant. Following the announcement of the spin-off, the interest to operating income before depreciation ratio, together with the cash equivalents to assets ratio are statistically different from zero at the1% level. Moreover, the results indicated that both the cash flow to assets and the industry variability of operating income to assets ratios can explain the leverage differences after the announcement of the spin-off. In contrast to past studies, Mehrota et al. (2003) found that there is a positive relation between profitability and leverage as a result of spin-off transactions.

Ahn and Denis (2004) examined changes in investment policy of a sample of 106 US corporate spin-offs occurred between 1981 and 1996. The authors reported a significant increase in the investment efficiency in the post-spin-off period and a positive relation between the excess value created by spin-offs and the changes in measures of investment efficiency. Moreover, Ahn and Denis (2004) found a positive cumulative market adjusted return of 4.03% for the 3-day event window (-1, +1).

Dittmar (2004) investigated the capital structure of 129 corporate spin-offs that occurred between 1983 and 1995. He asserted that the capital structure of spin-offs can reveal the company's choice of leverage since spin-offs did not previously have any individual capital structure. Looking at the leverage ratio (long-term debt plus debt in current liabilities) in pre- and post-spin-off years, he found that the subsidiaries' median and mean leverage ratio is significantly lower than that of parents (0.23 compared to 0.30). Moreover, a parent firm that has

spun off a subsidiary that belonged to the same SIC code experiences a statistically significant increase in the debt ratio compared to a cross-industry spin-off.

The study of Veld and Veld-Merkoulova (2004) is the first one which used data from Europe to assess the wealth effects of 156 spin-off transactions taking place between 1987 and 2000 using data from Europe. The authors computed both the short- and long-run market reaction to spin-off announcements. They found a cumulative average abnormal return of 2.62% over the three-day event window (-1, +1). This number jumps to 2.66% for the subsequently completed spin-offs. In addition, they found a stronger cumulative average abnormal return for the focus-increasing companies compared to the non-focus increasing firms in the 3-day event window (3.57% vs. 0.76%). However, in contrast to US studies, the authors do not find evidence of significant positive abnormal returns in the long-run. Finally, Veld and Veld-Merkoulova performed a cross-sectional regression for abnormal returns in order to detect the factors that determine spin-offs' wealth effects. The authors found that the industrial focus and the relative size of spin-offs display positive and statistically significant coefficients as opposed to the geographical focus, shareholders' rights and information asymmetry coefficients.

McConell and Ovtchinnikov (2004) tried to test whether investors can beat the market by investing in spun-off entities and their parents. They employed a sample of 311 non-taxable spin-offs which took place between 1965 and 2000 in the US market and measured the returns of parents and subsidiaries over different holding periods against two different benchmarks (industry- and size-matched and book-to-market-matched). For the first 12 months following the spin-off, the average cumulative excess return (CAR) is 19.40% against the first benchmark and 16.08% against the second one. Similarly, for the 24-month period the average CAR is 24.37% and 24.55%, respectively, whereas the 36-month holding period returns are 26.32% and 20.75%, respectively.

Rovetta (2006) studied the excess returns following spin-offs with respect to changes in investment policies of the spun-off entities. In her analysis, she used 200 US tax-free spin-off transactions from 1973 to 2000 and measured the event time abnormal returns for the subsidiaries over several time periods such as +6, +12, + 24, +36, +48 and +60 months following the spin-off. Her empirical findings revealed monthly excess returns of 0.89% for the following 6-month holding period, 0.51% for the 12-month holding period and 0.18% for the 36-month period when measured against industry- and size-matched companies. Based on the Fama and

French model (1993) she associated the change in investment levels with the size of excess returns and showed that in three years following the spin-off subsidiaries with growth opportunities increase their capital investment levels, while the subsidiaries with low growth opportunities tend to reduce their capital investments.

Qian and Sudarsanam (2007) analysed a sample of 170 European spin-offs during the 1987–2005 period. They argued that spin-off transactions can mitigate the agency conflicts within spun-off firms resulting in value gains. In particular, they documented a statistically significant relation between the long-term spin-off performance and the improvement in corporate governance of post-spin-off entities. Furthermore, the median difference of the market-to-book value of equity between the pre-spin-off and post-spin-off firms was found to be significantly different from zero at the 5% level. Finally, their study reported a higher value increase for the post-spin-off parent firms compared to the pre-spin-off seller firms.

Murray (2008) investigated the wealth effects of 60 spin-offs listed on the London Stock Exchange over the period 1992–2004. According to Murray, the U.K. environment differs from that of USA, since it is characterised by bank debt and by relatively extensive creditor protections. Consequently, bank debt providers tend to have a stronger position in the decision of the spin-off and also can influence the final distribution of the abnormal returns. In addition, he found evidence that U.K. parent firms, after conducting a spin-off, experience smaller significant abnormal returns than the US peers. Investigating the long-term impact of spin-offs on both the parent and subsidiary firms, Murray found a small operating performance improvement for the parent companies and a negative operating performance for the spun-off units.

Harris and Glegg (2008) found significant price response to spin-off announcements for a 58 cross-border spin-off sample for the period 1990–2006. Unlike to previous studies, Harris and Glegg focused their attention on the stock price reaction to spin-offs in which the parent and the subsidiary are located in two different countries. They found that the stock price reaction of a foreign subsidiary spin-off is statistically significant and equal to 1.11% and 2.23% in the two-day (-1, 0) and the three-day interval (-1, +1), respectively. The results are similar for domestic spin-offs. Moreover, the authors performed a multivariate cross-sectional regression analysis in order to test the relation among abnormal returns and target countries' characteristics. Their results confirmed that the abnormal returns are greater when the subsidiaries are located in countries with more active markets, stronger investor protection and greater economic freedom

and development. Finally, Harris and Glegg (2008) found that the announcement effects are positively related to takeover activities in the spun-offs units' countries.

More recently, Klein and Rosenfeld (2010) examined the causes and consequences of a sample of 57 "sponsored" firms from 1994 to 2005. The authors defined sponsored spin-offs those transactions where a substantial equity in the newly created firms was purchased from outside investors. That is, there is a cash inflow from outside investors to sponsored spin-offs. They compared the long-term stock and operating performance of sponsored spin-offs with those of conventional ones. The main finding of the study is that sponsored spin-offs differ from the conventional ones. In specific, the sponsored spin-offs abnormal performance is significantly negative over a three-year period after the spin-off date. Unlike the conventional spin-offs' significantly positive stock price reaction in the first two days of the spin-offs announcement, the corresponding reaction of sponsored spin-offs is not statistically significant. Klein and Rosenfeld (2010) found also that parent firms underperformed over the one-year period preceding the spin-off and are average performers after the spin-off.

Collectively, the above studies conclude that spin-offs are associated with positive abnormal behavior on the announcement date and thereafter. Moreover, the operating performance of either the parent firm or the spun-off entity is enhanced after the spin-off transaction. Table 1 summarizes the main findings of all published studies that analyze both short-term and long-term effects of spin-off announcements. This table is mainly based on the research of Veld and Veld-Merkoulova (2008).

[Insert Table 1 here]

3. Research Design

3.1. Sample selection

This study analyzes a sample of spin-offs that occurred either in Europe or in the USA between 2000 and 2009. We define a European spin-off the transaction where a European parent firm spins off a subsidiary. This subsidiary can be located either in the same or in a different country. Data for spin-off deals were virtually not existent for Eastern European countries and for that reason we restrict our European sample to Western European countries. Conversely, a US spin-off occurs when the parent

company is located in the USA and spins off a subsidiary which can be located either in the USA or in a different country.

The sample of spin-offs was formed by pooling information from several data sources. First, we had recourse to the Securities Data Corporation's Mergers and Acquisitions database (SDC Platinum) to find spin-off deals. Then, we cross-checked that each spin-off by searching Thomson One and Lexis-Nexis.

To identify the initial sample we impose the following criteria that:
(1) the announcement date of the spin-off transaction should have taken place between January 1st of 2000 and December 31st 2009; (2) the parent and the subsidiary company should be publicly traded; (3) the status of the spin-off transaction should be completed and not pending; (4) the parent company should be located either in the USA or in the Western Europe; (5) both the parent and subsidiary firms should be independently managed and separately valued at the stock market after the completion of the spinoff; (6) the separating subsidiary should have been in active operation for at least one year and have been owned, directly or indirectly, by the parent firm for at least one year; (6) parent firms did not belong to financial industry (SIC 6000–6999).

These criteria rendered an initial sample of 315 US and European spin-offs, 224 from the US market and 91 from the European market. However, a number of observations were eliminated from the sample due to several reasons. More specifically, we excluded those spin-offs where the parent company announced multiple spin-offs within the same fiscal year. In addition, we eliminated those observations where the spun-off firm stopped trading within the next fiscal year after the spin-off transaction (e.g. due to merge). Finally, we deleted those observations where there were no stock and accounting data for both parents and subsidiaries after spin-offs. The final sample consists of 239 spin-offs, that is, 177 from the US market and 62 from the European one.

Data for the daily adjusted closing prices for the parent firms and for the market indices of each country were culled from Bloomberg. Accounting data in regards to the parent and targets' home country, such as total assets, capital expenditures, EBITDA, and ROA were also derived from Bloomberg. Finally, SIC codes and industry sectors both for parents and subsidiaries were collected from Bloomberg and Thomson One.

Panel A of Table 2 displays the sample distribution of spin-offs for the whole sample and for the two sub-samples of US and European spin-offs. Spin-off transactions do not seem to be

concentrated around certain years, but instead they are scattered over the whole examined period. Year 2002 accounts for 19% of the total spin offs, while 39% of the spin-off deals occurred between 2005 and 2007 (93 out of 239 of the total sample), a time period shortly before the oncoming financial crisis. In spite of this modest clustering between 2005 and 2007, there is a sharp decline of spin-off transactions in 2008 and 2009 (15 and 7, respectively).

Panel B of Table 2 presents the sample distribution of spin-offs by the home country of the parent company. The majority of parent companies is located in the US market accounting of 74.1% (177 observations) of total spin-offs. The rest 25.9% (62 observations) of spin-offs took place in 12 European markets, with that of UK attracting 17 spin-offs and those of Italy and Sweden 10 deals.

[Insert Table 2 here]

Table 3 reports descriptive statistics for the spin off deals and accounting information for the parent firms at the end of the fiscal year just prior to the spin off announcement year (year -1). Panel A provides information for the sample of US spin-offs, Panel B for the sample of European spin-off deals and Panel C for the total sample. All figures reported are dollar-denominated.

The mean (median) transaction value for the US spin off deals is $1,719 million ($155.04 million), while that of European spin off deals is $894.40 million ($59.64 million). The total sample has a mean (median) transaction value of $1,387 million ($116.21 million). The mean (median) market value of the total sample is $17,073 million ($850 million), $16,836 million ($650.34 million) for the US sub-sample and $17,355 million ($975 million) for the European sample. The mean (median) book value of total assets is $36,624 million ($1,111 million) for the whole sample, $28,760 million ($967.38) for the US sub-sample and $47,929 million ($1,169 million) for the European sub-sample. Similar to Harris and Glegg (2007) we calculate the relative size as the ratio of transaction value to the market value of the parent company at the end of the fiscal year prior to the announcement year. In other words, relative size measures the size of the spun off subsidiary with respect to the size of the parent company. The mean relative size of the whole sample is 0.395, while that of the US sub-sample is 0.367 and 0.437 for the

European sample. Overall, the above descriptive statistics suggest that the European spin-off transactions are of relatively higher value compared to the US ones.

[Insert Table 3 here]

3.2 Methodology

We assess the wealth effects of cross-border spin-off announcements employing the market-adjusted model. In specific, we compute the abnormal returns for a period of 20 days around the spin-off announcement date (day -10 through day +10) both for the full sample and the various sub-samples. The market model parameters are estimated from day -210 to day -11. The value-weighted market index for each parent country's stock exchange is used to calculate the market return R_m (e.g. for the US parent firms we use the S&P 500 Index).

$$AR_{it} = R_i - R_{mt} \quad (1)$$

where R_{it} is the daily return of the *i*th firm on day t, R_{mt} is the market return on day t.

We average all abnormal returns (AR) across the number of observations. We also calculate cumulative abnormal returns (CAR) for parent firms over different time intervals around spin-off announcements.

Similar to Daley et al. (1997), Desai and Jain (1999) Veld and Veld_Merkoulova (2004) and Murray (2008) we explore the value effects of industrial focus-increasing spin-offs vis-a-vis the non-focus-increasing spin-offs (IF vs. Non-IF). We classify a spin-off to be a focus-increasing (or cross-industry spin-off) when the spun off unit operates in a different industrial sector than that of the parent firm. Conversely, a spin-off is deemed to be non-focus-increasing (or own-industry spin-off) if the parent and the spun-off firm operate in the same industry. Following Desai and Jain (1999), we split the whole sample of spin-offs into focus-increasing and non-focus-increasing spin-offs using the two-digit SIC code of the parent firm. Thus, when the two-digit SIC code of the spun off firm is different from that of the parent then this spin-off is classified as a focus-increasing spin-off. The pertinent literature on corporate focus of spin-offs is associated with significant value creation compared with spin-offs that do not alter their line of business (e.g. Daley et al. 1997; Desai and Jain, 1999). The reasons behind the increase of

stock prices of focus-increasing spin-off transactions are the reduction of diversity of unrelated lines of businesses that are poorly performing (removal of negative synergies), the improvement of management efficiency under well-suited core businesses (Daley et al., 1997) and the reduction of information asymmetry problems (Krishnaswami and Subramaniam, 1999).

We also test the differential market response to spin-offs that are geographically diversified. A geographical focus spin-off (GF) is identified when the subsidiary operates in a cross-border country compared to the parent. Conversely, a geographical non-focus spin-off (Non-GF) is the case where the subsidiary operates in the same country with that of the parent. The pertinent literature is insufficient to provide precise predictions as to whether the geographical focus can cause value creation. Denis et al. (2002) pointed out that global diversification increases shareholder value by exploiting firm-specific assets, by increasing operating flexibility and by satisfying investor preferences for holding globally diversified portfolios. On the other hand, they claimed that there are equally plausible reasons to believe that global diversification can reduce shareholder wealth. A globally diversified organization is more complex than a purely domestic firm which can lead to high costs of aligning corporate policies and to the inefficient cross-subsidization of less profitable business units. Regarding spin-offs, Denis et al. (2002) proposed that a spin-off of foreign subsidiary may be an indicator of its poor performance, or may signify an unfavorable decision, on behalf of the parent firm, to expand operations in the foreign market.

In addition to short-term stock price reaction to spin-off announcements, we examine the operating performance of subsidiaries and their parent firms over various periods preceding and following the spin-off. The operating performance is investigated using the return on assets (ROA) ratio, the earnings before interest, taxes, depreciation and amortization (EBITDA) to total assets (TA) ratio (EBITDA/TA) and the capital expenditures (CAPEX) to total assets (CAPEX/TA) ratio. A number of studies have used ROA as a performance measure (see, e.g. Daley et al., 1997, Klein and Resenfeld, 2010). We define ROA as the ratio of EBITDA to total year-end assets. Following Desai et al. (1999) we include in our analysis the ratio of operating cash flow to total assets ratio (EBITDA/TA) in order to examine the changes in the operating performance following spin-offs. This ratio is proposed to be a good proxy measure for the asset intensity and growth of firms (Ragothaman et al., 2002). Similar to Daley et al. (1997) we examine changes in the level of net capital expenditures in order to capture changes in the scale

of operations. We define net capital expenditures as the division of capital expenditures to total assets.

Similar to Desai et al. (1999) Murray (2008) and Klein and Rosenfeld (2010) we assess the operating performance employing the matching firm methodology. Particularly, we select two matching firms for each parent and spun off unit in our sample. The matching companies selected are based on two criteria: the total market value at the year-end of the spin-off (size) and the two-digit SIC code of each sample firm (industry). The closest matching firm (in terms of size and industry) is designated as the first matching firm and the second closest matching firm as the second matching firm. If the first matching firm stops trading for some reason, the second matching firm is used in our analysis. If the second matching firm has also disappeared, we assume that the sample firm does not have any benchmark for its performance. Therefore, the three operating ratios of the sample firms are compared with the corresponding ratios of the matching firms (industry-adjusted). Barber and Lyon (1997) analyzed the matching firm procedure and found that the significance levels and the t-statistics computed using a matching firm methodology are well specified in random samples (Desai and Jain, 1999, p. 85).

All operating ratios are computed for three years prior and after the spin-off year. In particular, for the sample of parent companies we calculate ratios for the three years prior to the spin-off year (-3, -2 and -1 year), on the year of the announcement (year 0) and for three post-spin-off years (+1, +2 and +3 year). We also compute the operating ratios for the spun-off firms (subsidiaries) for three years after the spin-off announcement year (+1, +2 and +3 years), where the spun off units are traded as independent companies. Finally, the operating ratios are estimated and tested for six discrete period intervals: (-3, +3), (-3, +2), (-3, +1), (-3, 0), (-2, +1) and (-2, +2). These period intervals allows us to detect whether the operating performance of parent firms has improved after the spin-off announcements. Following Murray (2008), we consider median values for our analysis. Due to the existence of extreme values in all ratios that can distort the results, we use medians as they are considered to provide a well-suited representation of each ratio. The statistical significance of the operating ratios is determined using the Wilcoxon/Mann-Whitney test for medians.

We also perform multivariate cross-sectional regression analysis in order to detect which variables determine the share price reaction to spin-off announcements. We use White's heteroscedasticity-consistent standard errors (White, 1980). The dependent variable is the

abnormal return on the announcement day (day 0) for the whole sample. The full regression model has the following form:

$$AR_i = a_0 + a_1 * GF_i + a_2 * IF_i + a_3 * ROA_i + a_4 * EBITDA / TA_i + a_5 * CAPEX / TA_i + a_6 * RT + a_7 * SR_i$$

(2)

Geographical focus (GF) is a dummy variable that takes the value of 1 in the case of a spin-off of a foreign subsidiary and 0 if the spin-off is. Bodnar et al. (2000), Click and Harrison (2000), Denis et al. (2002) and Veld and Veld-Merkoulova (2004) found mixed evidence for the effect of geographical focus on spin-off abnormal returns.

Industrial focus (IF) is a dummy variable that takes the value of 1 if the two-digit SIC code of the spun off entity is different from the corresponding two-digit SIC of the parent firm and 0 otherwise. This variable controls for the business relatedness between the parent firm and the target firm. According to previous studies (e.g. Daley et al. 1997; Desai and Jain, 1999; Veld and Veld-Merkoulova, 2004, Harris and Clegg, 2008) we expect a positive relation between focus-increasing firms and abnormal returns.

Return on assets (ROA) is used as a proxy to evaluate the performance of parent firms. ROA ratio is an appropriate performance measurement since it is the product of profit margin and asset turnover, therefore, an improvement in performance can be attributed to both components of ROA. If the spin-off division is the outcome of disposing unrelated lines of businesses, we expected that the operating performance of the parent firm will be improved after the transaction.

Similar to Desai and Jain (1999) we use the variable operating cash flow returns defined as EBITDA/TA, that is, earnings before interest, taxes, depreciation and amortization at the year-end of the spin-off event divided by the year-end total assets of parent firms. We include this accounting ratio of operating performance in our regression model in order to separate its possible connection with the abnormal returns from tax and bonding effects. We expect a positive effect of the operating cash flow to abnormal returns.

Capital expenditure to total assets (CAPEX/TA) ratio is used since to capture the association between announcement date's abnormal returns and improvement in business, due to new investment. It shows the measurement of parent firms' investment in the year of the spin-off event. Daley et al. (1997) and Gertner et al. (2002) implied a positive sign for this variable.

The relative size (RT) is the ratio of the market value of the spun-off subsidiary to the market value of the parent firm. Prior studies (e.g. Hite and Owers, 1983; Miles and Rosenfeld, 1983; Veld and Veld-Merkoulova 2004; Harris and Glegg 2008) found that the relative size is positively related to abnormal returns in spin-off announcements.

The shareholders rights variable (SR) is a measure of shareholder's protection in home countries. La Porta et al. (1998 and 2000) created an index of shareholder's protection for each country. The index ranges from zero to seven. The higher the value of the index, the higher the shareholder protection against unfavorable managerial behaviour. In general, the index value is higher for Anglo-Saxon countries and lower for the rest of countries. Therefore, SR is a dummy variable equal to 1 for Anglo-Saxon countries (i.e. USA and UK) and 0 otherwise. We expect that the higher the shareholder's protection status of the home country, the stronger the market reaction to spin-off announcements.

5. Empirical Results

5.1. Short-term reaction around spin-offs

The results from the stock price reaction to spin-off announcements are displayed in Table 4. Mean abnormal returns (AR) are over a two-day window (days -1 to +1) for the full sample and the two sub-samples of the US and European parent firms. Cumulative abnormal returns (CAR) and the percentage of positive values are also included. The results are consistent with the existing literature which documents positive excess returns on the spin-off announcement dates. Specifically, we find a significant abnormal return of 3.47% at the announcement day (t=3.23). The CAR in the two-day interval (days -1 and 0) is 5.55% and statistically significant at the 5% level (t=2.25). These excess returns are slightly higher than those reported in earlier studies. Daley et. al. (1997) reported a two–day announcement return of 3.4%, while Harris and Glegg (2008) reported a two–day announcement return of 1.11%. The 3-day CAR (-1 through +1) is also statistically significant and equal to 4.95% (t=1.66). This figure is higher than that reported by Miles and Rosenfeld (1983) who found a CAR of 3.76% and Desai and Jain (1999) who documented a CAR of 3.84% for the same time interval.

Separate results are presented for the sub-samples of the US and European spin-offs in Panels B and C, respectively. Results from the US market show a strong abnormal positive reaction in equity prices of 4.21% (t=2.95) at the announcement date. The corresponding share

price reaction of the European spin-off announcements is much lower and equal to 1.36%. These results are close to those found by Veld and Veld-Merkoulova (2004) who employed European spin-off data and obtained an abnormal return of 1.25% for day 0 and a CAR of 1.75% for the two-day interval -1 to 0. Panel D contains the statistical differences of means between the two sub-samples using the two-tailed test. On day 0 the mean abnormal return of US spin-offs is significantly higher than that of European ones (t=1.83). The CAR of two and three days confirms that the market reaction to US spin-off announcements provoke considerably stronger reaction vis-à-vis the European ones. An apparent interpretation of the differential market response to spin-off announcements between the two markets is the heterogeneous tax status of spin-off deals. According to previous studies (e.g. Schipper and Smith, 1983; Copeland, et al. 1987; Krishnaswami and Subramaniam, 1999) the majority of US spin-offs are taxable. On the other hand, European spin-offs are tax-free since the tax payment is deferred. Exceptions are the Netherlands, Germany and France (Veld and Vel-Merkoulova, 2004). In our European sample we have only 7 spin-offs from these countries and for that reason we assume that the European spin-offs are non-taxable. Veld and Vel-Merkoulova (2004) suggested that taxable spin-offs are associated with lower positive share price reaction than non-taxable spin-offs. Surprisingly, we find the opposite result.

[Insert Table 4 here]

Similar to Daley et al. (1997), Desain and Jain (1999), Veld and Veld-Merkoulova (2004) and Murray (2008) we assess whether spin-offs that increase their industrial focus (focus increasing sample) create more value than spin-offs which do not increase industrial focus (non-focus increasing sample). An increase in industrial focus is defined when the spun off entity operates in a different two-digit SIC code from its parent company. Tables 5 reports the results for a three-day window around the announcement date. In total, 149 firms increase their industrial focus via a spin-off deal. Panel A shows that these firms earn a mean abnormal return of 4.01% at the announcement date. This abnormal return is statistically significant at the 1% level. However, the CAR of three days is 4.38%, without being statistically significant. On the other hand, those firms that do not diversify the core activity of their subsidiaries (90 firms) reap an insignificant market reaction of 2.77% on day 0. However, the CAR of two-days is 5.46%,

statistically significant at the 5% level. The above results are in line with those found by previous studies which found larger excess returns for focus-increasing spin-offs than for the non-focus increasing spin-offs. Similar to Desai and Jain (1999), the three-day announcement period abnormal returns for the industrial focus-increasing firms are higher than those for the industrial non-focus increasing firms (4.39% vs. 3.95%). Consequently, we can assert that disposition of assets outside the core business of a firm is viewed by the market as value-increasing action.

When turning to the two sub-samples of the US and European spin-offs (Panels C and D) we see that US parent firms that increase their industrial focus earn a strong abnormal performance of 5.11% on the announcement date (t=2.82), while the European parent firms experience a marginal positive reaction of 1.10% on day 0 (t=1.32). The difference between the two sub-samples is 2.01%, statistically significant at the 5% level (Panel G). The result from the European sample is in stark contrast with that found by Veld and Veld-Merkoulova (2004) and Murray (2008) who employed European and UK data, respectively and reported significant stock price reaction for focus increasing parent firms on the announcement date. A plausible reason is the different period under study and the sample selection. There is a consistent reaction between US and European parent firms when decreasing their industrial focus (non-focus increasing). The US parents exhibit an insignificant market response of 3.06% on the announcements day, whereas the European parent firms experience a much lower abnormal performance of 1.86%. Both abnormal returns are non-statistically significant at any conventional level. Overall, the above results confirm earlier findings that firms reap significant benefits through divesting subsidiaries in unrelated industries.

[Insert Table 5 here]

We also check for heterogeneous share price response to spin-off announcements for firms that divest their subsidiaries through cross-border spin-offs. When the subsidiary operates in a different country from that of the parent company is deemed to increase its geographical focus. The majority of subsidiaries (215) operate in the same country with their parents (geographical non-focus), while the rest of subsidiaries (24) are identified to be cross-border (geographical focus). Table 6 reports the short-term market reaction according to geographical focus. In the pertinent literature, there is a mixed evidence for the association between abnormal returns and geographical

diversification. In our sample, we find evidence of positive and significant value increase of 2.02% for the group of firms that do not increase their geographical focus. On the other hand, geographical diversification does not induce significant market reaction on announcement dates. This result is in line with that of Denis et al. (2002) and Veld and Veld-Merkoulova (2004) who studied the effects of global diversification in firm value and concluded that a reduction in geographical diversification (geographical non-focus) produces excess value, while an increase in geographical diversification (geographical focus) is related with valuation discounts. The reasons behind the negative reaction to geographical diversification is a possible reduction of economies of scale in production, a relative disadvantage of the spun-off vis-à-vis its competitors which are incumbents in the market and a signal of bad decision to cross border expansion (Veld and Veld-Merkoulova, 2004).

The US and European parent firms that are engaged in a cross-border spin-off deal do not experience significant value appreciation on and around spin-off announcement dates. In particular, at the announcement date, the US sample exhibits an excess return of 3.47% and the European one an excess return of 0.75%. Their mean differences are also non-significant. On the other hand, both the US and European parents earn significantly abnormal returns of 2.80% and 1.42%, respectively, on the announcement date. Although their mean difference on day 0 is not statistically significant, their CAR of three days is statistically significant at the 10% level (t=1.70). This result suggests that the US firms can benefit more than their counterparts by spinning off domestically than the European firms. The tax-free status that US spun-off firms enjoy after the deal can explain the higher stock returns compared to the taxable European spin-off deals.

[Insert Table 6 here]

5.2. Operating performance of spin-offs

In this section we analyze the operating performance of parents for three years surrounding the spin-off transaction and for three years after the deal for subsidiaries. The operating performance is investigated using three financial ratios: the return on assets (ROA) ratio, the earnings before interest, taxes, depreciation and amortization to total assets ratio (EBITDA/TA) and the capital expenditures to total assets (CAPEX/TA) ratio. ROA measures overall operating performance. The operating cash flow to total assets ratio (EBITDA/TA) is deemed to be a good proxy

measure for the asset intensity and growth of firms (Ragothaman et al., 2002). Finally, capital expenditure to total assets captures changes in the scale of operations. Similar to Desai et al. (1999), Murray (2008) and Klein and Rosenfeld (2010) we analyze the three ratios employing the matching firm methodology. That is, for each parent or subsidiary we identify at least one firm from the same sector which displays the same two-digit SIC code and being of similar market value. Then, the median values of parent or subsidiaries are compared with those of matching firms.

Panel A of Table 7 presents the median ROA for parent and matching firms. For the full sample we detect an upward trend of ROA from year -3 (2.643) up to year -1 (3.421). In years -1 and 0 the ROA is statistically different and higher than that of matching firms. Since the year of transaction, the trend of ROA is downward. In year +3, the sample of matching firms has a significantly higher ROA compared to parent firms. These results suggest that the operating performance of parent firms worsens after the spin-off deal. In addition, for the post-spin-off period parent firms' median ROA underperforms relative to their matched firms. Similar pattern is detected for the US and European parent firms that are involved in a spin-off. However, the US parent firms do not experience significant deviations in their operating performance relative to their matched firms either pre event or post-event. The European parents, on the other hand, have notably lower ROA than their matched firms in the second and third year after the spin-off (2.359 vs. 3.525 in year +2 and 1.388 vs. 4.498 in year +3). These results imply a substantial underperformance of European parent firms compared to their matched firms after the transaction. This is not the case for US parent firms.

Panel B of Table 7 illustrates the post-spin-off ROA ratio for subsidiaries as compared to their matched firms. We see that spun-off entities experience a gradual decline in their ROA, from 2.390 in Year +1 to 1.079 in Year +3. The median difference for this period is 1.312, statistically significant at the 10% level (Panel D). At the same time, the median differences between parent firms and matched firms are not statistically significant in any of the post event years. When looking at the US subsidiaries, we observe a decline in ROA for all years after the deal which is significantly lower than their matched firms. The same decline in ROA is detected in case of European spun-offs, however, their matched firms do not outperform significantly in either of the three post event years. Collectively, these results suggest that US spin-offs

experience a dramatic decrease in their operating performance compared with their counterparts, while the European subsidiaries closely follow the performance of their competitors.

[Insert Table 7 here]

The results from the operating ratio (EBTDA/TA) mostly confirm the patterns observed in ROA analysis. Panels A and C of Table 8 presents the results for EBITDA/TA ratio in the pre- and post-spin-off period for the sample of parent firms and is compared with their industry peers. We note that there is a steady decline in the EBITDA/TA ratio in the post- spin-off years in line with the study of Desai et al. (1999). In particular, the EBITDA/TA ratio from 0.093 in Year -3 falls to 0.075 in Year +1. The median difference for this period is statistically significant at the 10% level (Panel C). At the same time, the matched firms present higher operating cash flow to total assets performance. In Year +2, the sample of matching firms has statistically different EBITDA/TA ratio than parent firms. Almost the same pattern offers the investigation of US and European parents. In all post-event years the sample of matched firms outperform those of US and European parents with most notable years to be +1 and +2 for the US firms and +3 for European ones.

Panel B does not indicate any significant improvement in the EBITDA/TA ratio in the post-spin-off period for the spun off units. However, the EBITDA/TA ratio declines in years +2 and +3 in line with the findings of Desai et al. (1999). The US sample of subsidiaries displays a similar pattern for all years. However, a notable difference occurs in the case of European subsidiaries which display a gradual increase in their operating performance as measured by the EBITDA/TA ratio which is 0.071 in Year +1 and rises to 0.098 in Year +3. For Years +2 and +3 the sample of matched firms has a slight lower performance compared to European subsidiaries. These results clearly indicate that European subsidiaries benefit from the divestiture in the long-term.

[Insert Table 8 here]

Next we explore the degree to which parent firms invest resources in the subsidiary prior to the spin-off. As a part of the parent's organization, the subsidiary must, in most cases, rely on

the parent firm to finance its capital investments. If the parent considers the subsidiary either as a bad performer and/or has limited growth opportunities, it might be reduce the investment in the subsidiary and, instead, overinvest in its more profitable divisions. One way to investigate this possibility is to examine the subsidiary's capital expenditures to total assets ratio before and after the spin-off (Klein and Rosenfeld, 2010),

Table 9 reports results on changes in the CAPEX/TA ratio in the pre- and post-spin-off years for parent companies. The results show a steady decline in the CAPEX/TA ratio from 3.5% in Year -3 to 2.3% in Year +2. This decline is statistically significant at the 1% level. Comparing parent firms and their matched ones, we see that for Year -1 the median CAPEX/TA ratio is 2.5% versus 4.2%, respectively. The median difference is statistically significant at the 5% level. For Year +1 parents' CAPEX/TA ratio remains lower than their matched firms and statistically significant at the 10% level. For Years +2 and +3 parents' median ratio is lower than that of the matched firms, but the differences are not statistically significant. These results are in line with the findings for Klein and Rosenfeld (2010) who found that parent firms constrain the capital expenditures after the spin-off deal.

When examining the US and European parent capital expenditure policy separately, we observe a notable difference. The US parent firms reduce gradually their capital expenditure when deciding to divest relative to their matched firms. In Years -1 and 0 the median difference of the CAPEX/TA ratio between the US parents and their matched firms is statistically significant the 5% level, with the latter having higher ratios for both years. On the other hand, the European firms act more optimistically when deciding to invest in their subsidiaries operations. In specific, in Year 0, the European parents increase their capital expenditure to 4.4% from 2.7% in the previous year and, with the exception of Year +1, they retain this level of capital expenditure in higher levels compared with their industry competitors. However, the median differences are not statistically significant in the post event period.

Overall, the results show deterioration in the capital expenditure policy of parent firms in the post-spin-off era compared to the pre-spin-off one. This result implies less purchase of assets, allowing the parent firm to concentrate more to its core business and reduce the excessive volatility of the subsidiary (Cusatis et al., 1993). However, the European parent firms deviate from this rule by increasing the capital expenditure as a percentage to total assets in the year of the spin-off deal and retain this level in the post-spin-off years. European parent firms may

perceive that their subsidiaries will face more profitable investment opportunities when operating separately and for that reason they overinvest at the time of the spin-off.

[Insert Table 9 here]

5.3. Regression analysis

We perform multivariate regression analysis in order to investigate the factors that construe abnormal returns around spin-offs. The dependent variable is the abnormal return on day 0 of the full sample. Table 10 illustrates five different regression models which are based on the full regression model described in the methodology section. Before performing regressions, we conducted pair wise correlation and covariance tests among variables to ensure that they are not correlated. We use White's heteroskedasticity-consistent standard error estimates for calculating t-statistics. Due to high correlation between EBITDA/TA and CAPEX/TA ratios, we use each in separate regressions.

Regression (1) employs two independent variables that capture operating performance, that is, EBITDA/TA and ROA. EBITDA/TA ratio is positive and statistically significant at the 5% level (t=2.40), implying that there is a positive association between abnormal returns and parents' firms operating performance. This result confirms the finding of Desai and Jain (1999) who also came across with a positive and significant relation between abnormal returns and parents' firms operating performance. In the same regression model, ROA has a negative and statistically significant coefficient (t=-2.82). This result implies that parent firms decide to spin off their subsidiaries in order to improve their profitability performance.

Regression (2) expands regression (1) by including industrial and geographical focus as control variables. Consistent with previous research, we find that firms increasing industrial focus experience significant abnormal returns. Thus, the coefficient of the industrial focus is positive and statistically significant at the 5% level. On the other hand, firms that geographically diversify their business (geographical focus) do not experience positive returns. Consequently, the coefficient of the geographical focus is negative, but statistically insignificant. EBITDA/TA and ROA display the same sign as in regression (1).

Regression (3) repeats regression (2) by substituting EBITDA/TA with CAPEX/TA as these variables are highly correlated. The latter has a negative and statistically significant

coefficient. The negative sign of CAPEX/TA ratio implies that parent firms with low level of new investments decide to detach targets with higher level of capital requirements. The coefficient of ROA remains negative and significant, the dummy that deals with industrial focus is positive and significant while that of geographical focus is negative and statistically insignificant.

In regression model (4) we exclude operating performance measures and we include the relative size variable along with industrial and geographical focus. The results show a positive coefficient for industrial focus and relative size. These findings corroborate those of Veld and Veld-Merkoulova (2004) who also found positive and significant coefficients. The positive sign of the relative variable suggests that large spin-offs are associated with higher abnormal returns.

Finally, in regression (5) we include all previous control variables along with that of shareholders rights. The EBITDA/TA ratio remains positive and significant at the 10% level. The geographical focus variable remains negative and statistically insignificant, while industrial focus has a positive and statistically significant coefficient. Furthermore, ROA maintains its negative sign but is non-significant. The effect of shareholder protection in abnormal returns is negative and insignificant. The sign of the shareholder rights coefficient is not the expected one, but this can be ascribed to the fact that La Porta et al. index (2008) does not control for the rights of the other stakeholders in a firm such as the bondholders, employees etc (Veld and Veld-Merkoulova, 2004).

[Insert Table 10 here]

6. Conclusion

Past studies focus on the short- or long-term wealth effects arising from corporate spin-offs either in European or in the U.S. market. In this study, we examined the announcement period abnormal returns together and separate for the European and US markets. By employing a sample of total 239 spin-off events, (177 in U.S. and 62 in Europe), announced between January 2000 and December 2009, we investigated three empirical questions. First, we tested whether the announcement abnormal returns in the USA differ from those in Europe and whether an increase in focus, industrial or geographical, can affect firm value. Second, we investigated which factors explain the abnormal returns behaviour surrounding spin-offs. Finally, we analyzed whether parents and subsidiaries experience any improvement in their operating performance in the post-spin-off period.

Confirming previous research, we found that spin-off announcements provoke a significant abnormal return of 3.47%. However, the US firms benefit from spin-off transactions more compared to European firms. In specific, the US parent firms earn an abnormal return of 4.2i% while the European parents gain lower abnormal returns of 1.36%. The mean difference between the two samples is significant in the announcement day and in a three-day period surrounding the event. We also found that the industrial focus-increasing parent firms reap significant abnormal returns of 4.01% on the announcement day vis-à-vis of 2.77% for the industrial non-focus increasing firms. This finding supports the idea that parent firms by detaching unrelated businesses can benefit from the removal of negative synergies, or can increase management efficiency under well-suited core businesses or can reduce information asymmetry problems arising from heterogeneous business operations. A noteworthy finding of our research is the differential market reaction of US and European firms when increasing industrial focus. The former seem to enjoy higher and stronger share price appreciations when increasing industrial focus compared to European ones. Regarding geographical focus the results clearly show that cross-border diversification does not add value in parent firms. Instead, divesting domestically can bring about positive wealth effects. The results do not alter when US and European samples are considered.

We also investigated the operating performance of both parents and subsidiaries in the post-spin-off period. We employed three financial ratios, ROA, EBITDA/TA and CAPEX/TA. The results show a considerable decrease in all three ratios for parent firms from the years prior to post spin-offs. However US firms exhibited lower operating performance in the post-spin-off years compared to European ones. On the other hand, European parent firms seem to act more optimistically when deciding to divest their subsidiaries. They raise the capital expenditure in an attempt to benefit in the future from an improvement of subsidiaries performance. Subsidiaries also pertains a lower operating performance after the spin-off year regardless of their location.

Our study contributes to the pertinent literature by investigating spin-offs simultaneously in the USA and Europe and test for differential market behavior in these two areas. Since spin-offs are associated with positive abnormal returns at the announcement date, this type of divestment seems to be of great importance for managers and shareholders of the parent firm. In addition, there is an indication that the firms do not outperform their competitors that are not

involved in a spin-off transaction in the long-term. This finding implies that the economic benefits for the parent firms are limited to short-term.

Future research can be directed to the investigation of the wealth effects of spin-off announcements in markets that have not been so far examined such as Japan, China etc. Moreover, it would be interesting to test the creditworthiness of these firms that are involved in a spin-off by checking credit ratings and compare them with the capital structure. Finally, the examination of the corporate governance and management structure of the spun-off firms would shed light in the question of whether subsidiaries follow a different leadership model from that of their parents.

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Table 1. Studies of spin-offs

Panel A: Studies of the short-run reaction to spin-off announcements for parent firms

Study	Journal	Country	Examinaton period	Observations	Event window	CARs %
Schipper and Smith (1983)	Journal of Financial Economics	USA	1963-1981	93	(-1, 0)	2.84***
Hite and Owers (1983)	Journal of Financial Economics	USA	1963-1981	123	(-1, 0)	3.3***
Miles and Rosenfeld (1983)	Journal of Finance	USA	1963-1980	55	(0, 1)	3.34***
Rosenfeld (1984)	Journal of Finance	USA	1963-1981	35	(-1, 0)	5.56***
Copeland, Lemgruber and Mayers (1987)	Chapter in a book	USA	1962-1982	188	(-1, 0)	3.03***
Denning (1988)	Accounting and Business Research	USA	1970-1982	42	(-6, 6)	2.58
Seifert and Rubin (1989)	Journal of Economics and Business	USA	1968-1983	51	(-1, 0)	3.26***
Ball, Rutherford and Shaw (1993)	Journal of Real Estate Research	USA	1968-1990	39	(-1, 0)	2.55
Vijh (1994)	Journal of Finance	USA	1964-1990	113	(-1, 0)	2.90***
Johnson, Brown and Johnson (1994)	Quarterly Journal of Business and Economics	USA	1980-1991	113	0	3.42***
Allen, Lummer, McConnell and Reed (1995)	Journal of Financial and Quantitative Analysis	USA	1962-1991	94	(-1, 0)	2.15***
Michaely and Shaw (1995)	Financial Management	USA	1981-1988	9	(-1, 1)	3.08
Slovin, Sushka and Ferraro (1995)	Journal of Financial Economics	USA	1980-1991	37	(0, 1)	1.32**
Seward and Walsh (1996)	Strategic Management Journal	USA	1972-1987	78	(-1, 0)	2.6***
Johnson, Klein and Thibodeaux (1996)	Journal of Financial Research	USA	1975-1988	104	(-1, 0)	3.96***
Daley, Mehrotra and Sivakumar (1997)	Journal of Financial Economics	USA	1975-1991	85	(-1, 0)	3. 3.4***
Abarbanell, Bushee and Raedy (1998)	Working paper	USA	1980-1996	179	(-1, 5)	2.87**
Desai and Jain (1999)	Journal of Financial Economics	USA	1975-1991	144	(-1, 1)	3.84***
Krishnaswami and Subramaniam (1999)	Journal of Financial Economics	USA	1979-1993	118	(-1, 0)	3.28***
Mulherin and Boone (2000)	Journal of Corporate Finance	USA	1990-1999	106	(-1, 1)	4.51***
Murray (2000)	Working paper	UK	1992-1998	25	(-1, 1)	0.19

Low (2002)	Financial Markets, Institutions and Instruments	USA	1992-1999	121	(0, 1)	1.3
Maxwell and Rao (2003)	Journal of Finance	USA	1974-1997	79	(0, 1)	3.59***
Siddiqi and Warganeraga (2003)	Review of Quantitative Finance and Accounting	USA	1980-1996	117	(-1, 1)	3.75***
Kirchmaier (2003)	Working paper	Western Europe	1989-1999	48	(-1, 1)	5.4***
Ahn and Denis (2004)	Journal of Financial Economics	USA	1981-1996	150	(-1, 1)	4.03***
Veld and Veld-Merkoulova (2004)	Journal of Banking and Finance	Western Europe	1987-2000	156	(-1, 1)	2.62***
Wheatley, Brown and Johnson (2005)	Review of Quantitative Finance and Accounting	USA	1980-1993	112	(-1, 0)	4.0***
Sin and Ariff (2006)	Working paper	Malayasia	1986-2002	85	(-1, 0)	1.8*
Sudarsanam and Qian (2007)	Working paper	Western Europe	1980-2005	157	(-1, 0)	4.24***
Veld and Veld-Merkoulova (2008)	Financial Management	USA	1995-2002	91	(-1, 1)	3.07***
Murray (2008)	Journal of Business, Finance and Accounting	UK	1992-2004	60	(-1, 1)	1.82***
Harris and Glegg (2008)	Journal of Multinational Financial Management	International	1990-2006	58	(-1, 1)	2.23**
Klein and Rosenfeld (2010)	Financial Management	USA	1994-2005	57	(-1, 0)	0.21

Panel B: Studies of the long-run reaction to spin-off announcements for pro-forma combined firms

Study	**Journal**	**Country**	**Examinaton period**	**Observations**	**Event window**			
					up to 6 months	**up to 12 months**	**up to 24 months**	**up to 36 months**
Cusatis, Miles and Woolridge (1993)	Journal of Financial Economics	USA	1965-1988	141		4.7	18.9**	13.9
Desai and Jain (1999)	Journal of Financial Economics	USA	1975-1991	155		7.7	12.7	19.8***
Veld and Veld-Merkoulova (2004)	Journal of Banking and Finance	Western Europe	1987-2000	45-61	-2.2	-2.3	4.2	2.0
Sudarsanam and Qian (2007)	Working paper	Western Europe	1980-2005	129		-2.3	8.3	8.4

Panel C: Studies of the long-run reaction to spin-off announcements for parent firms

Study	Journal	Country	Examinaton period	Observations	Event window			
					up to 6 months	up to 12 months	up to 24 months	up to 36 months
Cusatis, Miles and Woolridge (1993)	Journal of Financial Economics	USA	1965-1988	131	6.8*	12.5**	26.7***	18.1
McConell, Ozbilgin and Wahal (2001)	Journal of Business	USA	1989-1995	80	8.6	13.5	19.2	5.1
Desai and Jain (1999)	Journal of Financial Economics	USA	1975-1991	155		6.5	10.6	15.2
Veld and Veld-Merkoulova (2004)	Journal of Banking and Finance	Western Europe	1987-2000	68-106	3.9	-0.7	6.5	-0.4
McConell and Ovtchinnikov (2004)	Journal of Investment Management	USA	1965-2000	311				1.49
Sudarsanam and Qian (2007)	Working paper	Western Europe	1980-2005	129		-3.9	6.2	7.1
Klein and Rosenfeld (2010)	Financial Management	USA	1994-2005	57		-0.6	0.2	-0.0

Panel D: Studies of the long-run reaction to spin-off announcements for parent firms

Study	Journal	Country	Examinaton period	Observations	Event window			
McConell and Ovtchinnikov (2004)	Journal of Investment Management	USA	1965-2000	311		19.4***	24.37***	24.55***
Rovetta (2006)	Financial Markets and Portfolio Management	USA	1973-2000	200	1.42***	0.6*	-0.09	0.43**

Table 2. Sample distribution of spin-offs by year and country

Panel A: Distribution of spin-offs by year

Year	Full	%	USA	%	Europe	%
2000	9	4%	9	5%	0	0%
2001	24	10%	21	12%	3	5%
2002	46	19%	35	20%	11	18%
2003	18	8%	12	7%	6	10%
2004	27	11%	18	10%	9	15%
2005	28	12%	21	12%	7	11%
2006	39	16%	26	15%	13	21%
2007	26	11%	18	10%	8	13%
2008	15	6%	11	6%	4	6%
2009	7	3%	6	3%	1	2%
Total	239	100%	177	100%	62	100%

Panel B: Distribution of spin-offs by parent country

Parent country	N	%
USA	177	74.1%
UK	17	7.1%
Italy	10	4.2%
Sweden	10	4.2%
Belgium	5	2.1%
Norway	5	2.1%
France	3	1.3%
Germany	3	1.3%
Ireland	3	1.3%
Portugal	3	1.3%
Switzerland	1	0.4%
Austria	1	0.4%
Netherlands	1	0.4%
Total	239	100%

Table 3. Descriptive statistics for the parent firms (in million dollars)

Variable	Mean	Median	Std.dev	Min	Max
Panel A: Full sample					
Transaction value ($ million)	1,387	116.21	5,061.08	0.020	45,532
Market value ($ million)	17,073	850	51,475	0.031	460,867
BV of assets	36,624	1,111	207,268	0.101	2,540,811
Relative size	0.395	0.136	0.918	0.001	9
Panel B: US sample					
Transaction value ($ million)	1,719	155.04	6,245	0.020	45,532
Market value ($ million)	16,836	650.34	47,143	0.542	241,866
BV of assets	28,760	967.38	123,000	0.101	902,210
Relative size	0.367	0.138	0.594	0.001	5.050
Panel C: European sample					
Transaction value ($ million)	894.40	59.64	2,574	0.020	16,056
Market value ($ million)	17,355	975	57,085	0.031	460,867
BV of assets	47,929	1,169	288,871	0.361	2,540,811
Relative size	0.437	0.133	1.201	0.001	8.518

This table reports descriptive statistics on the deal characteristics and the accounting information for the parent firms at the time of the spin off announcements. All figures are dollar-denominated. Market value is computed as price times the number of shares outstanding at the end of the fiscal year prior to the spin off announcement. Relative size is calculated as the ratio of transaction value to the market value of the parent company at the end of fiscal year prior to the announcement. The book value of total assets is measured at the end of fiscal year prior to the spin-off announcement.

Table 4. AR's and CAR's around spin-off announcement dates

Panel A: Full sample (N=240)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	2.08	1.70*	53	2.08	
0	3.47	3.23***	59	5.55	2.25**
+1	-0.61	-0.68	47	4.95	1.66*

Panel B: US sample (N=178)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	2.68	1.62	50	2.68	
0	4.21	2.95***	62	6.89	2.19**
+1	-0.21	-0.19	47	6.68	1.73*

Panel C: European sample (N=62)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.38	1.26	60	0.38	
0	1.36	2.17**	52	1.73	1.61
+1	-1.74	-1.28	46	-0.12	-0.01

Panel D: Differences between US and European samples

Period	t-Statistic
Day 0	1.83*
CAR (-1, 0)	2.37**
CAR (-1, +1)	2.47**

Note: *, ** , *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 5. AR's and CAR's around spin-off announcement dates (industrial focus)

Panel A: Industrial focus full sample (N=149)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.37	0.37	52	0.37	
0	4.01	2.99***	58	4.38	1.52
+1	0.01	0.01	50	4.39	1.24

Panel B: Industrial non-focus full sample (N=90)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	2.69	1.51	53	2.69	
0	2.77	1.54	62	5.46	1.99**
+1	-1.52	-0.78	42	3.95	1.17

Panel C: Industrial focus US sample (N=108)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.37	0.26	49	0.37	
0	5.11	2.82***	63	5.48	1.44
+1	0.25	0.24	49	5.74	1.23

Panel D: Industrial focus European sample (N=41)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.37	0.92	61	0.37	
0	1.10	1.32	44	1.49	1.52
+1	-0.64	-0.60	54	0.84	0.71

Panel E: Industrial non-focus US sample (N=69)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	3.40	1.65	52	3.40	
0	3.06	1.30	61	6.46	1.88*
+1	0.66	0.43	45	7.11	1.69*

Panel F: Industrial non-focus European sample (N=21)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.36	0.98	57	0.36	
0	1.86	1.23	57	2.21	1.17
+1	-3.89	-1.13	33	-1.68	-0.73

Panel G: Differences between samples

	IF vs. Non-IF	US IF vs. EU IF	US Non-IF vs. EU Non-IF
Period	t-Statistic	t-Statistic	t-Statistic
Day 0	0.55	2.01**	0.48
CAR (-1, 0)	-0.37	1.61	1.31
CAR (-1, +1)	0.12	1.68*	1.75*

Note: *, ** , *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 6. AR's and CAR's around spin-off announcement dates (geographical focus)

Panel A: Geographical focus full sample (N=24)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	3.28	1.05	63	3.28	
0	2.99	1.12	67	6.27	0.72
+1	-5.40	-1.65	46	0.87	0.08

Panel B: Geographical non-focus full sample (N=215)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	1.10	1.22	52	1.22	
0	2.02	2.20**	58	3.12	1.47
+1	0.34	0.47	47	3.47	1.63

Panel C: Geographical focus US sample (N=18)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	3.68	0.89	61	3.68	
0	3.47	1.05	62	7.42	0.64
+1	-3.26	-1.60	39	4.17	0.30

Panel D: Geographical focus European sample (N=6)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	2.69	1.46	67	2.69	
0	0.75	0.99	50	2.82	0.59
+1	-1.82	-0.97	47	-1.00	-0.53

Panel E: Geographical non-focus US sample (N=159)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	1.31	1.08	49	1.31	
0	2.80	2.13**	61	4.11	1.62
+1	0.76	0.81	48	4.87	1.57

Panel F: Geographical non-focus European sample (N=56)

Days	AR%	t-Statistic	% positive	CAR %	t-Statistic
-1	0.20	0.67	59	0.20	
0	1.42	2.07**	52	1.62	1.83*
+1	-0.66	-0.83	45	0.95	0.88

Panel G: Differences between samples

	GF vs. Non-GF	US GF vs. EU GF	US Non-GF vs. EU Non GF
Period	t-Statistic	t-Statistic	t-Statistic
Day 0	-0.08	0.93	0.71
CAR (-1, 0)	1.20	1.28	1.52
CAR (-1, +1)	0.19	1.70*	1.37

Note: *, ** , *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 7. ROA ratio for parents and spun off units

Years	Full Sample Median	Matching Sample Median	Difference	US Sample Median	US Matching Median	Difference	European Sample Median	European Matching Median	Difference
Panel A: Parents' pre- and post-spin-off ROA ratio									
-3	2.643	3.011	-0.368	2.643	2.798	-0.155	2.721	3.224	-0.503
-2	2.997	3.044	-0.047	3.023	3.323	-0.300	2.997	2.552	0.445
-1	3.421	2.575	0.846*	3.273	2.609	0.664	3.627	2.551	1.076
0	3.298	2.535	0.763*	2.590	2.171	0.419	3.719	2.613	1.106
+1	2.100	2.186	-0.086	1.935	2.141	-0.205	2.542	2.310	0.232
+2	1.903	2.590	-0.686	1.522	2.260	-0.738	2.359	3.525	-1.166*
+3	2.612	3.789	-1.177***	2.971	3.514	-0.543	1.388	4.498	-3.110***
Panel B: Spun off units post-spin-off ROA ratio									
+1	2.390	3.627	-1.236	2.561	4.422	-1.860*	2.115	2.116	0.001
+2	1.465	3.107	-1.642	2.401	5.499	-3.097***	1.160	1.478	-0.318
+3	1.079	2.035	-0.956	1.777	4.101	-2.324**	0.926	1.108	-0.182
Panel C: Median differences for parents' ROA ratio									
(-3, +3)			0.031			-0.328			1.333
(-3, +2)			0.740			1.121*			0.362
(-3, +1)			0.543			0.708			0.179
(-3, 0)			-0.665			0.053			-0.998
(-2, +1)			0.897			1.087*			0.455
(-2, +2)			1.094			1.501*			0.638
Panel D: Median differences for spun off units' ROA ratio									
(+1, +2)			0.925			0.160			0.955
(+1, +3)			1.312*			0.784*			1.189**

Table 8. EITDA/TA ratio for parents and spun off units

Years	Full Sample Median	Matching Sample Median	Difference	US Sample Median	US Matching Median	Difference	European Sample Median	European Matching Median	Difference
Panel A: Parents' pre- and post-spin-off operating performance ratio									
-3	0.093	0.096	-0.003	0.082	0.090	-0.008	0.104	0.101	0.003
-2	0.091	0.096	-0.005	0.095	0.093	0.003	0.085	0.098	-0.013
-1	0.083	0.092	-0.009	0.081	0.091	-0.010	0.093	0.094	-0.001
0	0.082	0.093	-0.011	0.077	0.093	-0.016	0.091	0.093	-0.002
+1	0.073	0.087	-0.014	0.078	0.104	-0.026*	0.071	0.084	-0.013
+2	0.075	0.093	-0.018*	0.073	0.095	-0.022*	0.078	0.089	-0.011
+3	0.090	0.098	-0.009	0.094	0.094	0.000	0.077	0.113	-0.036*
Panel B: Spun off units post-spin-off operating performance ratio									
+1	0.091	0.092	-0.001	0.106	0.105	0.001	0.071	0.074	-0.004
+2	0.081	0.099	-0.019	0.085	0.127	-0.042	0.073	0.070	0.003
+3	0.086	0.091	-0.008	0.081	0.105	-0.024	0.098	0.069	0.029
Panel C: Median differences for parents' operating performance ratio									
(-3, +3)			0.003			-0.012			0.026
(-3, +2)			0.018			0.009			0.025
(-3, +1)			0.020*			0.004			0.033
(-3, 0)			0.011			0.005			0.013
(-2, +1)			0.018			0.017			0.015
(-2, +2)			0.016			0.022			0.007
Panel D: Median differences for spun off units' ROA ratio									
(+1, +2)			0.010			0.025			-0.002
(+1, +3)			0.005			0.021			-0.027

Table 9. Capital expenditure/ total assets ratio for parents and spun off units

Years	Full Sample Median	Matching Sample Median	Difference	US Sample Median	US Matching Median	Difference	European Sample Median	European Matching Median	Difference
Panel A: Parents' pre- and post-spin-off capital expenditures/total assets ratio									
-3	0.035	0.040	-0.005	0.032	0.036	-0.004	0.041	0.047	-0.005
-2	0.033	0.041	-0.008	0.029	0.040	-0.011	0.045	0.042	0.003
-1	0.025	0.042	-0.017**	0.024	0.040	-0.016**	0.027	0.046	-0.018
0	0.024	0.036	-0.012	0.020	0.036	-0.016**	0.044	0.043	0.001
+1	0.022	0.036	-0.014*	0.021	0.031	-0.010	0.027	0.046	-0.020
+2	0.023	0.026	-0.003	0.020	0.026	-0.006	0.031	0.027	0.004
+3	0.027	0.028	-0.001	0.024	0.025	-0.001	0.038	0.037	0.001
Panel B: Median differences for parents' capital expenditures/total assets ratio									
(-3, +3)			0.007*			0.008*			0.003
(-3, +2)			0.012***			0.012**			0.011
(-3, +1)			0.013***			0.011**			0.015
(-3, 0)			0.011**			0.012**			0.003
(-2, +1)			0.011**			0.008			0.019
(-2, +2)			0.011**			0.010*			0.014

Table 10. Regression of abnormal returns for the full sample of spin-offs

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.012 (1.515)	-0.001 (-0.129)	-0.001 (-0.026)	-0.022 (-1.370)	-0.006 (-0.269)
Return on Assets	-0.001 (-2.822)***	-0.001 (-2.870)***	-0.001 (-2.757)**		-7.08^{E-5} (-0.814)
EBITDA/TA	0.001 (2.403)**	0.001 (2.325)**			0.001 (1.853)*
CAPEX/TA			-1.48^{E-5} (2.998)***		
Geographical Focus (GF)		-0.028 (-1.068)	-0.027 (-1.030)	-0.032 (-0.861)	-0.029 (-0.933)
Industrial Focus (IF)		0.018 (2.208)**	0.016 (2.121)**	0.014 (1.841)*	0.018 (1.729)*
Relative size (RT)				0.114 (2.166)**	0.076 (0.808)
Shareholders' Rights (SR)					-0.003 (-0.709)
Number of Observations	147	147	149	147	149
R^2 (%)	8.34	9.90	11.96	4.20	8.66
Adjusted R^2 (%)	7.07	7.34	9.51	2.57	3.12

Note: *, **, *** denote statistical significance at the 10%, 5% and 1% level, respectively.