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European spin-offs Origin, value creation, and long-term performance

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Abstract

This paper tests the empirical validity of theoretical predictions on corporate spin-offs motivations and ex-post performance. Using a unique data set of completed spinoffs in twelve European countries we show that spin-off decisions are frequently triggered by firm's governance changes, such as the appointment of a new CEO or a takeover threat. Post-transaction long-run stock returns and operating performance are observed for spin-off firms only, and mostly for internally-grown business units and parent-related (non-focusing) subsidiaries. We find no evidence that post-spin-off mergers of either parents or subsidiaries enhance long-term performance, or that focus-increasing spin-offs lead to efficiency improvements.

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« Theoretically, spin-offs should not work ....
Still, on the whole, restless chief executives would do well to keep their cheque books closed and examine spinning-off, rather than adding to, imperial outposts ».

Financial Times Lex Column, April 25th 2005.

I. INTRODUCTION

A spin-off is one of several tools for asset redeployment and firm's restructuring. Some spin-offs are the reverse of previous mergers, but more frequently an internally grown business unit is spun off as a separate publicly traded firm. From a legal point of view, a spin-off is a pro-rata distribution of subsidiary shares to parent-firm's existing shareholders, and often it is a non-taxable transaction for the parent corporation. What distinguishes a spin-off from other types of asset redeployment (e.g. equity carve-outs, asset sales) is that they do not provide a cash inflow to either the parent-firm or the subsidiary-firm. The absence of external financing and taxes, make spin-offs an interesting corporate transaction to analyze the determinants and the economic effects of decisions that alter the scope of the firm.

There is a large empirical literature on spin-offs, primarily based on US data. Many studies have documented the parent-firm positive stock price effect associated with the announcement of spin-offs.[1] More controversial is the issue of whether spin-offs produce ex-post performance improvement, and the channels through which long-term value is created. Cusatis, Miles and Woolridge (1993) present evidence of abnormal stock returns for parents and subsidiaries which are merged or acquired after the spin-off. Some studies fail to find post spin-off improvement in operating performance (e.g. Michaely and Shaw (1995)). Daley, Mehrotra and Sivakumar (1997) and Desai and Jain (1999) show that only when parent-firm and subsidiary-firm operate in different industries (focus-increasing spin-offs) there is evidence of post-spin-off efficiency improvements evidenced in both abnormal stock returns and operating performance. Moreover, their results indicate that

[1] Using US data see, e.g., Hite and Owers (1983), Miles and Rosenfeld (1983), Schipper and Smith (1983), Allen *et al.* (1995), Michaely and Shaw (1995), Slovin, Sushka and Ferraro (1995), Daley, Mehrotra and Sivakumar (1997), Desai and Jain (1999), Krishanaswami and Subramaniam (1999), Mulherin and Boone (2000), Chemmanur and Paeglis (2001), Gertner, Powers and Scharfstein (2002), Wruck and Wruck (2002), Maxwell and Rao (2003) and Ahn and Denis (2004). Veld and Veld-Merkoulova (2004) analyze a sample of European spin-offs, while Choi and Han (2006) study a sample of Japanese spin-offs.

improvement in post-spin-off performance is mainly associated with parent-firms, and non-focusing spin-offs are typically underperforming subsidiaries. Chemmanur and Nandy (2006) use plant level data to analyze change in productivity after spin-offs. They find that productivity increases only in parent-firm plants, mainly through cost cuts. In contrast to existing empirical studies, Chemmanur and Nandy show that productivity improvements after the transaction are found in both acquired and non-acquired business units, and regardless of whether the spin-off is focus-increasing or non-focus increasing. Further, their results indicate that subsidiary plants do not perform worse than parent plants before the spin-off.

In this paper we attempt to shed light on the conflicting results of published research by examining a sample of European firms that completed a spin-off, and provide evidence related to two questions. First, what factors motivate European firms to undertake spin-offs? Second, do spin-offs result in performance improvements?

There are several reasons why a study on European spin-offs may reveal alternative determinants and long-term effects. First, differences in firms' ownership structure and corporate governance among EU countries, or compared to the US, suggest that these factors may contribute differently to firms' spin-off decision. It is well known that concentrated ownership structures prevail in Europe (see, e.g. Faccio and Lang (2002)), and these are associated with larger benefits of control. Thus, given the larger private benefits of control typically observed in firms with concentrated ownership structure, it is interesting to examine why a controlling shareholder would voluntarily reduce firm size and control rights in a (relatively) costly spin-off that does not raise capital. Second, differences in laws and enforcement are known to explain the intensity and the pattern of mergers and acquisitions around the world (see, e.g. Rossi and Volpin (2004)). Consequently, we conjecture that decisions to reverse mergers by spinning off subsidiaries to facilitate takeovers should also be influenced by differences in national regulations. Third, corporate spin-offs in Continental Europe are a relatively recent phenomenon. The European Union (EU) issued in 1982 the 6th Directive (82/891 of 17 december 1982) with the goal to harmonize EU countries national laws and to make spin-offs a viable and economically efficient restructuring transaction. Since then tax-free spin-offs became more common in EU countries.

In this study, we document that spin-off decisions in Europe are often triggered by firm's governance earth-quakes, such as an appointment of a new CEO or a takeover threat. We obtain this result by comparing sample firms with control firms that did not undertake spin-offs during the all period of study. We use univariate analysis and logistic regressions to provide evidence on the determinants of the likelihood of spin-offs. These findings indicate that even in less active markets for mergers and corporate control break-up decisions are enforced by the monitoring activity of outside investors and capital markets.

Second, we provide new evidence on the factors explaining the well known spin-off announcement effects. We show that a significant component of stock price reaction is related to spin-offs that originated from past acquisitions, and this effect supersedes the much reported effect of focus-increasing spin-offs. This result suggests that spin-off research should pay attention in identifying subsidiary's origin; a characteristic that appears to be more relevant than classifying spun-off units into focus-increasing and non-focus-increasing.

We next analyze the long-run efficiency improvements of spin-offs. Looking at abnormal stock returns and operating performance we find that only internally developed subsidiaries and parent-related units (non-focusing) are the spin-offs that create significant market value and operating efficiency improvements. These findings contrast the US evidence where focus-increasing spin-offs and spin-offs involved in a subsequent merger are those showing significant value creation and efficiency improvements. Further, our evidence highlights that much of increased efficiency is generated by spun-off units and not by parent-firms.

The remainder of the paper is structured as follows. Section II briefly review the spin-off theory and summarize empirical findings on spin-off value creation and post transaction efficiency improvements. Section III describes the data, variables, control measures, and provides descriptive statistics for the sample. Section IV reports empirical results. Section V concludes.

II. LITERATURE REVIEW AND HYPOTHESES

The finance and economics literatures suggest several motives for value maximizing spin-offs. Among them, four are prominent: (1) the managerial incentives hypothesis; (2)

the focus (or efficiency) increasing hypothesis; (3) the asymmetric information hypothesis; (4) the corporate control hypothesis.[2] Theoretical models also derive specific predictions on three relevant moments of a typical corporate spin-off: (a) before the decision is announced (predicting the likelihood of a spin-off); (b) when the spin-off is announced to capital markets (explaining the short-term change in parent-firm shareholders' wealth) and (c) after the spin-off is completed (explaining the long-term operating performance and stock returns of separated business units). These theories are not mutually exclusive, and thus we expect to find some support for each. Moreover, it is interesting to analyze whether some of these theories describe the data better than others.

Managerial incentives: Aron's (1991) theoretical model proposes that spin-off efficiency improvements will be obtained by designing new incentive contracts for divisional managers. Schipper and Smith (1983) were the first to suggest that spin-offs may enable shareholders to better monitor managers and reduce agency costs. Consistent with this hypothesis Seward and Walsh (1996) document a significant increase of incentive contracts for CEOs of spun-off subsidiaries, although they show there is no association between incentive contracts and stock market announcement effects. Pyo (2006) tests more directly the prediction of the managerial incentives hypothesis and shows that new compensation packages is a significant motive for spin-offs and may lead to improved post-spin-off operating efficiency.

The managerial incentives hypothesis predicts that new compensation plans for managers is an important determinant of spin-off decision, and they will be significantly related to shareholder's value creation and efficiency improvement after the transaction.

Focus (or efficiency) increasing: The corporate focus literature (see, e.g. Comment and Jarrell (1995) and John and Ofek (1995)) suggests that spin-offs that increase corporate focus (i.e. eliminate negative synergies among different firm's divisions) should create

[2] Other explanations for spin-off gains include tax and regulatory benefits (Schipper and Smith (1983)), the transfer of wealth from bondholders to stockholders (Galai and Masulis (1976), Parrino (1997) and Maxwell and Rao (2003), and the optimal allocation of debt between the two firms resulting from the spin-off (John (1993)). We do not investigate the validity of these hypotheses in our study as we analyze only tax-free and voluntary spin-offs. Moreover, the predictions of the bondholder-stockholder wealth redistribution hypothesis and of the debt allocation hypothesis are difficult to verify in the European context as European firms tend to carry much less market debt than US firms and the vast majority of debt finance is provided by bank loans, which are typically senior to public debt and carry greater guarantees than a bond or debenture. Therefore, differences in bargaining power between lenders and bondholders could exert a better creditor protection and result in lower or insignificant wealth or debt transfer among security holders when a corporate restructuring is undertaken.

value and improve efficiency.[3] There is significant support for the efficiency hypothesis. Daley *et al*. (1997) and Desai and Jain (1999) show that announcement returns for focus increasing spin-offs are significantly higher than non-focusing ones. Furthermore, they document that, after the transaction, significant increases in accounting profitability and stock returns are concentrated in focusing spin-offs only.

The focus increasing hypothesis makes specific predictions about spin-off announcement returns and post-transaction performance measures. It predicts that spin-offs where the subsidiary operates in a different industry should have greater value creation and ex-post larger efficiency improvements.

Asymmetric information: The asymmetric information hypothesis is built on the idea that multi-divisional firms are less transparent and typically undervalued. Breaking up the conglomerate firm could reduce the information asymmetry in the market and improve the quality of information on each division cash flows that could be inferred by both incumbent managers and outside investors. Theoretical models by Habib *et al.* (1997) and Nanda and Narayanan (1999) predict that a spin-off will help remove parent undervaluation, augment market attention on firms' securities, and allow firms to obtain better conditions in security issue transactions. Krishnaswami and Subramaniam (1999) report evidence that there are changes in the information environment of firms following spin-offs. They document increased earning forecast accuracy and lower dispersion in analysts' earnings forecasts after spin-offs. Moreover, firms that undertake spin-offs raise more capital following the break-up than before, and relative to comparable firms. Gilson *et al.* (2001) find that after a break-up there is an increase in analyst coverage leading to improved earnings forecast accuracy.

The asymmetric information hypothesis has specific implications for the likelihood of spin-offs and for the parent-firm announcement price effects, but it has no predictions for post-transaction performance. This theory implies that parent-firm undervaluation will be an important determinant of spin-off decision and that the two separated units will be more active in raising funds in capital markets after the transaction.

Corporate control: The corporate control hypothesis is proposed by Chemmanur and Yan (2003) who posit that spin-offs discipline management by increasing the firm's

[3] Focus increasing spin-offs are usually defined when the parent-firm and subsidiary-firm operate in different industries. In Section IV.D we provide details about the focus/non-focus spin-off classification we adopted in this paper.

exposure to the possibility of a takeover. The empirical implications are basically four: (1) a more active market for corporate control will influence spin-off decisions as activist investors and takeover threats can put pressure on parent-firm's decision to restructure through a break-up; (2) spin-off announcement price effects will be correlated with the degree of takeover activity in the parent-firm industry; (3) after the transaction, improvements in long-term operating performance will be observed for spun-off subsidiaries because of higher managerial discipline and efficiency; (4) post-spin-off long-term positive abnormal stock returns will be observed only with parents and subsidiaries involved in mergers and acquisitions.

III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

III.A. DATA SOURCES AND SAMPLE CONSTRUCTION

This research focus on pure voluntary tax-free completed spin-offs by European non-financial firms.[4] It is crucial to the objective of this study to correctly identify pure spin-offs, and separate them from other type of restructuring and divestiture transactions with which they are frequently confused.

The study constructs a unique dataset compiled from many different databases.[5] We start assembling the sample by searching the Thomson Financial ONE Banker Mergers and Acquisitions database in order to identify all spin-offs announced by listed Western European companies. The initial sample covers the period from January 1985 to June 2005, and it includes 338 transactions. We next verify the accuracy of the ONE Banker M&A data by comparing it to news articles found in Lexis/Nexis, including related news reported in local languages in each country major national newspapers. Stock market and accounting data are retrieved from Thomson Financial DataStream International and Worldscope databases. We also used the Research Insight Compustat Global and the Amadeus Top 250,000 databases to perform further checks of accounting data and transactions' characteristics[6]. We believe this level of scrutiny makes our sample

[4] In a tax-free spin-off, shareholders of the parent-firm receive a distribution of stock in the subsidiary representing all or a majority of the parent's shares in the subsidiary. Upon the distribution, the parent does not have to pay tax on any gain, and shareholder tax is deferred until the shares are sold. We check the tax status of each spin-off in sample by examining the tax code of the parent-firm country and announcement statements. See also European Tax Handbook (various years since 1990).

[5] Detailed variable definitions and data sources are reported in Appendix I.

[6] Research Insight Compustat Global is a trademark of Standard & Poor's, and Amadeus Top 250,000 is a trademark of Bureau Van Dijk.

of European spin-offs unique and clean of confounding events frequently described as corporate spin-offs in available databases.

From the initial list we drop 193 transactions for the following reasons: 142 entries were incorrectly recorded as spin-offs (30 carve-outs and right issues, 38 split-ups and 74 internal restructuring programs); 5 cases of duplicate data entry; 7 cases where the subsidiary was already listed prior to the spin-off; and 39 cases where a clear announcement date and news article were not found. From the remaining list of 145 announced spin-offs we then eliminated 15 pending/withdrawn transactions as of June 2005, and 6 cases in which parent-firm stock price data was not available. We finally exclude 27 spin-offs completed by firms with operations in regulated industries (utilities (2 cases, SIC code 4911), and financial services (25 cases, SIC codes between 6000 and 6999)), as regulation may confound comparisons. Thus, our final sample consists of 92 listed non-financial corporations headquartered in 12 Western European countries that announced and completed the spin-off of 97 subsidiaries from January 1989 to June 2005[7].

III.B. CONTROL SAMPLE OF NON-SPIN-OFF FIRMS

Our empirical methodology requires comparing characteristics and performance of firms involved in spin-offs with that of similar firms that do not undertake a spin-off. Accordingly, we construct a matching sample for each parent and subsidiary by selecting firms that did not undertake a spin-off in the five years centered on the spin-off completion year (-2,..0,..+2), that are headquartered in the same geographic area (1) UK and Ireland; 2) Nordic Countries (Denmark, Finland, Norway and Sweden); and 3) Continental Europe (Belgium, Germany, Italy, Netherlands, Spain and Switzerland)), that have the same three-digit SIC code, and that are closest in market value of equity (+/- 30%) and book-to-market ratio. If we do not find a matching firm in the same geographic area and/or with same three-digit SIC code, we rely on the whole European data set to identify the closest firm by two-digit SIC code, market value of equity and book-to-market ratio.

III.C. SAMPLE CHARACTERISTICS

Panel A of Table 1 shows the sample country-distribution where it emerges that spin-offs are more frequent transactions in Great Britain and Sweden than in Continental Europe. The average spin-off relative size reveals that spin-offs in Europe are large transactions;

[7] Five parent-firms complete two spin-offs each separated by several years.

on average, larger than similar transactions sampled in recent US studies (see, e.g. Desai and Jain (1999) and Krishnaswami and Subramaniam (1999)).The median time required to complete (from announcement date to ex-date) the European spin-off is four months, but it can be worked out in just forty days in countries such as Spain, or require about one year as in Germany. Consistent with past studies, Panel A shows that the majority of spin-offs are represented by focus-increasing transactions (61, or about 63% of final sample). In panel A we also document that 73 spin-offs (75% of final sample) are internally developed subsidiaries. The rest of the sample (25%) consists of spin-offs which unwind earlier acquisitions. To distinguish and to identify which spin-offs were internally developed and which spin-offs originated from a previous acquisition we construct a complete "corporate history" of parent-firms and subsidiary-firms through press articles (LexisNexis and major national European newspaper databases), information available on Thomson ONE Banker database, and by reviewing parent-firm's public files and corporate websites. The distinction between internally developed and previously acquired spin-offs is important as it may reflect different corporate strategies. We conjecture that a spin-off decision can either signal that the break-up will be through a potential winner or by correcting a past mistake. This aspect is often neglected in the spin-off literature.[8] One notable exception is the study by Allen, Lummer, McConnell and Reed (1995), that provides evidence that shareholder gains associated with spin-off announcements are in some cases the undoing of earlier unwise acquisition. They label this as the "correction-of-a-mistake" hypothesis, which predicts a larger rebound in parent-firm stock price when the spin-off of previously acquired subsidiaries is announced.

[Insert Table 1 about here **]**

Our sample of parent- and subsidiary-firms represents about 35 different industries, with the largest concentration in the Chemicals and Allied Products Industry, Business Services and Electronic & Other Electric Equipment. Moreover, the sample includes primarily European domestic spin-offs, where both parent-firm and subsidiary-firm

[8] However, it's worth noting that some authors have argued that although spin-offs and divestitures frequently reverse past mergers, these transactions are not always past failures, as parent-firms may separate business segments because of evolving corporate strategies and changes in product markets. See for example Weston (1989) and Kaplan and Weisbach (1992).

operate and are listed in the same country. We find only two cases of cross-border spin-off, which involves the assets of a subsidiary operating in a different country.

In Table 1, panel B we present selected statistics on parent-firms and control-firms at the end of month before the spin-off announcement date or, in case of accounting figures as of fiscal year end prior to the spin-off announcement year (Year -1). The median size of the European parent-firm that undertake a spin-off is relatively large, as measured by market value of equity (€1.08 billion), total assets (€1.26 billion) or total sales (€1.65 billion). Matched control firms show similar characteristics, with mean and median market value, profitability, investment, leverage ratios and residual standard deviation not statistically different from those measured for parent-firms. Panel B also shows summary statistics on subsidiary-firms and their control-firms at the end of spin-off completion month or, in case of accounting figures, as of fiscal year end following spin-off completion year. The subsidiary- and their matched firms have similar values for all the variables reported; we detect no significant mean or median differences with respect to size, profitability, investment and leverage ratios.

Panel C of Table 1 presents descriptive statistics for multi-segment parents and their respective control-firms for the two years surrounding the spin-off completion (year -1 and year 0). Of the 97 sample spin-offs we are able to gather segmental data for 82 parent-firms; 63 (65%) are undertaken by parents with 2 or more business segments as reported in Worldscope database, and single-segment parents are 19, or 20% of the whole sample. Panel C shows that multi-segment parents have on average more than 3 business segments in the year before the spin-off is completed. By contrast, similar firms have on average 2 business segments and both the mean and median differences are statistically significant at the 5% level. As expected, parents have a statistically significant decline in the number of segments in the spin-off completion year, while the reduction in the number of segments is not observed for control firms. To analyze the degree of diversification we also compute the sales-based Herfindahl index. Parent-firms exhibit a significant increase in both the mean and median Herfindahl index from the year before the spin-off to the year the spin-off is completed. By contrast, no change in the Herfindahl index is observed for matched control firms in the same time period. Based on evidence on number of segments and Herfindahl index we find that parents undertaking spin-offs are more diversified than control firms. This result is, however, consistent with past

studies of US spin-offs. Next, we look at Tobin's *Q* for parent- and control-firms to ascertain differential performances. We compute Tobin's *Q* as the ratio of market value of equity plus book value of total assets less book value of equity and over book value of total assets. Parents' Tobin's *Q* declines after the spin-off is completed, but the change is not statistically significant. Perhaps more interesting, matched-firms show a similar Tobin's *Q* in the same time period, and no significant change across the two years. Finally, Panel C presents the diversification value for the year preceding the spin-off and the completion year. To compute the diversification value we follow closely Berger and Ofek's (1995) methodology. Their algorithm computes the difference between the market value of the diversified firm and the sum of the imputed value of all the firm's segments, based on the sales multiplier valuation method of the stand-alone firms. Further, we require that the sum of segment sales as reported by Worldscope must be within 1% of total sales from annual profit and loss accounts. This requirement results in a drop of 13 parent-firms for which total sales exceed those reported in consolidated statements. Thus, the final sample is of 50 parent-firms.[9] Consistent with the diversification and the spin-off literature, we find that multi-segment parent-firms in the year prior to the spin-off trade at substantial discount (mean -40% and median -22%) relative to comparable single-segment firms. Both mean and median are significantly different from zero at the 1% level. Matched-firms, by contrast, exhibit relative value similar to comparable single-segment firms. They show slightly negative (-0.4%) diversification discount, on average, while median is slightly positive (0.2%), and both are not significantly different from zero. Furthermore, the mean and median differences in diversification discount between parents and controls are statistically significant at 1% level in both years.

[9] We believe that most of the validity of the value loss from diversification of parent-firms presented in Table 1, Panel C, depends on management disclosure policies and are therefore subject to the well known self-reported bias (e.g., Villalonga (2004)). In fact, contrary to US regulation (FASB 14 and SEC S-K) which require US firms to report segment information since fiscal years ending December 1977, European firms started to release voluntarily segmental data gradually from the end of 1980s. European Union (EU) regulation on corporate financial statements is under the Seventh European Directive (86/635/EEC), which was adopted by the EU Council of Ministers on June 13, 1983, and implemented by Member States from January 1st, 1988. The directive, art. 34, para. 8, requires segmental reporting of consolidated net turnover by activity and geographical markets. The directive, art. 45, para. 2, allows omission of segmental reporting if its nature would be prejudicial to any undertakings affected by that disclosure. Omission must be disclosed in the statement notes. France, Germany, and Greece implemented the Directive before January 1st, 1988. Luxembourg, the Netherlands, and the United Kingdom enacted legislation to be effective during the financial year 1990. Belgium, Denmark, and Portugal adopted the Directive by the financial year 1991. Ireland and Spain follow in the financial year 1992, and Italy adopted it by financial year 1994. Starting from the 2005 financial year, European listed companies must have consolidated group account statements according to IAS (International Accounting Standards). IAS 14 concerns segmental reporting.

The level of diversification discount of European parent-firms undertaking spin-offs seems high if compared to studies such as Lang and Stulz (1994) and Berger and Ofek (1995), who find that discount averages 10% across large samples of US multi-segment firms, and Lins and Servaes (1999), who find no diversification discount for German conglomerates and 15% discount in the UK. However, more recently Ahn and Denis (2004) find that the mean (median) diversification discount for a sample of US parent-firms undertaking spin-offs is 31% (18%), which are much closer to our figures for European parents[10]. In the spin-off completion year parent-firms mean discount is lower (-28%), but the median is higher (-30%). However, while mean and median are still significant different from zero at the 5% level, we find no significant change between values in the two years. These results show that: 1) multi-segment parents continue to be traded at discount relative to stand-alone firms even after the spin-off transaction is completed, and 2) multi-segment parents have significantly larger discount than similar multi-segment firms that do not undertake a spin-off.

IV. EMPIRICAL RESULTS

IV.A. MOTIVES FOR CORPORATE SPIN-OFFS DECISIONS

We first turn our attention to analysis of spin-off announcement statements made by parent-firm managers and financial analysts reported in the financial press to assess the spin-off motives. We believe it is interesting to investigate the consistency between the reported motives for spin-offs and the theoretical predictions outlined in section II. The reasons most commonly reported at spin-off announcement time are: strengthening of corporate focus strategy (57%), restructuring operations and underperforming assets (42%), a part of a merger/acquisition plan (22%), improvement of information flows and gaining a better access to capital markets (20%)[11]. This preliminary evidence supports the predictions of refocusing, asymmetric information, and corporate control hypotheses on the factors affecting spin-off decision.

IV.B. CORPORATE CONTROL EVENTS BEFORE SPIN-OFF DECISION

[10] Ahn and Denis (2004) compute the excess value following the methodology proposed by Rajan et al. (2000). However, our diversification discount calculation is very much similar. Our findings are also consistent with empirical results presented in Berger and Ofek (1999) and Dittmar and Shivdasani (2003). These papers show that refocusing firms experience a mean value destruction of about 30% at time of divestiture-related announcements, which include asset sales and spin-offs.

[11] The total percentage of motivations is greater than 100% because several announcements reported more than one reason for undertaking the spin-off.

In this section we investigate whether market discipline affects spin-off decision in Europe. Past research on restructuring of US firms (see, e.g. Denis et al. (1997), Berger and Ofek (1999), and Dittmar and Shivdasani (2003)), have found that corporate control changes are common before these events. Moreover, some studies on US spin-offs highlight the role of corporate governance in increasing the probability of undertaking a spin-off (see, e.g. Wruck and Wruck (2002) and Ahn and Walker (2006)).

Table 2 reports the frequency of several corporate control and capital structure events observed during the time period from 12 months before to 1 month after the spin-off announcement both for parents and their control-firms. A CEO change occurred in 32 parent-firms (33%) prior to the spin-off, whereas it is observed in only 10 control-firms (10%) in the same time period, with difference being statistically significant at 1% level. We also find that parents received a merger proposal or were a target of a takeover attempt before the spin-off in 18% of cases, while only 3% of control-firms experienced such pressure. The two rates are significantly different at 1% level. Other types of events where we detect a statistically significant difference between parents and their controls is observed for outside investors (defined as pension funds, hedge funds and individual block-holders) activism and the establishment of new compensation plans for top managers. Events related to financial distress decisions and capital structure changes are also observed during spin-off announcement time period, but their frequency is not statistically different from that of matched-firms. Overall, 81 parent-firms (84%) undertaking a spin-off experience at least one corporate control event in the 13 months surrounding the spin-off decision. However, what is remarkable is that spin-off announcement statements almost never mention external pressures, takeover threats and other facts we uncover in our search. Taken all together, these results confirm the intuitions of both the managerial incentives and corporate control hypotheses on the economic factors affecting spin-off decisions.

[Insert Table 2 about here **]**

IV.C. THE DETERMINANTS OF CORPORATE SPIN-OFF DECISION

The results of univariate analysis of previous section show that CEO turnover and discipline imposed by the market for corporate control are important events around the time the spin-off decision is publicly announced. In this section we tackle directly the

issue of the determinants of spin-off decision by estimating several logit regression models to determine whether univariate results hold after controlling for other variables associated with spin-off decision. The dependent variable of logit models is an indicator equal to 1 for parent-firms and 0 for control firms matched on industry, size, country, and book-to-market ratio and that did not undertake spin-offs during all period of study.

We employ specific variables to test predictions of the theoretical literature on spin-offs. The CEO CHANGE and COMPENSATION PLANS are dummy variables which take the value of 1 when a CEO change and a new top management compensation plan have been announced and/or realized in the year before spin-off announcement date. Both variables are predicted by the managerial incentives hypothesis to exert a positive influence on the likelihood of a spin-off. The TAKEOVER THREAT variable is linked directly to the predictions of Chemmanur and Yan's (2004) corporate control theory. The variable is constructed as a dummy that takes the value of 1 whether either a merger or a controlling acquisition were announced/attempted in the twelve months before the spin-off announcement date. Also linked to the corporate control theory are the variables DIVESTITURES and ACQUISITIONS. They measure, respectively, the number of asset sales and acquisitions completed by the firm in the twelve months before spin-off announcement date. The two variables are also proxies for the intensity of the market for corporate control and it is predicted that they will be positively associated with the spin-off decision. The variable ANALYSTS FORECAST is the forecast error of mean analyst estimate of firm earnings per share (source: I/B/E/S) in the year preceding the spin-off announcement date. The variable is directly linked to the predictions of asymmetric information theory of spin-offs (e.g. Habib *et al.* (1997)) and has been used in prior empirical research (e.g. Krishnaswami and Subramaniam (1999)). It predicts that higher analyst forecast error will be associated with higher information asymmetries and it will positively affect the spin-off decision. DIVERSIFICATION VALUE is computed as in Berger and Ofek (1995) by estimating the difference between the market value of the firm and the sum of the imputed value of all the firm's segments, based on the sales-multiplier valuation method of the stand-alone firms. Table 1, panel C, has shown that multi-segment parent-firms typically suffer from a large and significant value loss from diversification in the year before spin-off announcement date. The diversification value variable is also related to the asymmetric information theory, as undervalued firms wish

to undertake a spin-off to be correctly valued by capital markets and reduce adverse selection costs (Nanda and Narayanan (1999)). We predict an inverse relationship between the firm's diversification value and the likelihood of spin-off decision, since the lower is the diversification value (the discount), the higher will be the probability a firm will undertake the spin-off.

The logit regression models include a fixed set of three independent variables to control for firm's performance, degree of diversification, and growth rate, all measured before the spin-off public announcement date. Similar variables have been used in prior empirical research (e.g. Krishnaswami and Subramaniam (1999)). Further, as the sample of parents and matched firms included in the logit regressions are of same industry, similar size and book to market ratio, we need not to control for these specific factors which could be correlated with spin-off decision.[12]

The logit regression (1) in Table 3 shows that the CEO CHANGE variable is significantly positively related to the spin-off decision, consistent with the managerial incentives hypothesis. Next logit regression (2) indicates that the variable COMPENSATION PLAN is positively associated with the spin-off decision, but it is not significant at conventional level. Comparing the first two regressions Pseudo-R^2 we observe the much higher effect of CEO CHANGE on the spin-off decision. Logit model (3) shows that TAKEOVER THREAT is a highly significant determinant of spin-off decision: the estimated coefficient is significant at the 1% level and the regression is highly significant. This result is consistent with disciplining effects of market for corporate control, as predicted by the corporate control theory of spin-offs. Logit model (4) test directly one implication of the asymmetric information hypothesis. Model (4) uses the financial analyst mean forecast error on earnings per share, and the estimated coefficient is positive as predicted by theory, but it is not significant at conventional level. Logit regression (5) uses the diversification discount as an alternative proxy of the asymmetric information hypothesis. Although the sample size is reduced due to missing segmental data, the estimated coefficient is of predicted sign and significant at 10% level. Regressions (6) and (7) use the DIVESTITURES and ACQUISITIONS variables as

[12] Our control variables are: 1) operating performance ratio (ROA); 2) Sales based Herfindahl index (HERFINDAHL); 3) average sales growth of past three years (SALES GROWTH). We also run logit regressions using alternative control measures. We use previous year parent's stock return to replace ROA; the number of segments at the 3-digit SIC code level (SEGMENTS) to replace HERFINDAHL, and 3) the average R&D expenses of past three years (R&D RATIO) to replace SALES GROWTH. When we use a different set of control variables we obtain similar results.

alternative proxies to test the corporate control hypothesis. In all the cases estimated coefficients are positive as expected, yet not significant at conventional levels.

[Insert Table 3 about here]

Overall, logit regression results confirm predictions of both the managerial incentives and corporate control hypotheses. We find only weak support for the asymmetric information theory, based on variables related to financial analysts' forecast error and parent-firm relative valuation. The empirical results on the determinants of European spin-offs are novel, and to a certain extent surprising given the prevailing ownership structure, corporate governance and market mechanisms.

IV.D. PARENT FIRMS ANNOUNCEMENT RETURNS

In this section we report evidence of spin-off announcement returns for European parents. We estimate a market model event-study methodology as described in Brown and Warner (1985)[13]. We focus on the three days announcement window (-1,0,+1), where day 0 is the announcement day retrieved either from Thomson ONE Banker database or an earlier announcement date found in Lexis/Nexis or national press databases. The cumulative abnormal returns (*CARs)* to parent-firms in sample are summarized in Table 4. Consistent with existing literature, we find an average *CAR* of 4.8% (median 2.7%) for the whole sample of European spin-offs. Both mean and median are significant at 1% level, and about 65% of the sample exhibit positive announcement returns[14]. Moreover, the increase in parent-firm shareholders' wealth averages € 26 million (median €8 million) and it translates into about 10% of the end-of-ex-month market value of the spun-off unit.

[Insert Table 4 about here]

We then turn our attention to differences in abnormal returns between spin-off subgroups. First, we document the difference between focus and non-focus spin-offs. Earlier studies of US spin-offs found that announcement effects of focusing increasing

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[13] We assume that a domestic one-factor model represents the returns generating process: $R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$, where R_{it} is the return of security *i* on day *t*, R_{mt} is the return of the DataStream General market index of the parent-firm country on day *t*, and ε_{it} is a random error term. For each security, the market model is computed over days -220 and -21 relative to the announcement date of the spin-off (day 0). To take into consideration possible problems of non-synchronous trading, each regression was run using the Scholes-Williams (1977) procedure, and OLS coefficients were adjusted accordingly. Finally, to test for significance of abnormal returns we follow Dodd and Warner (1983) method of aggregating standardised abnormal returns.

[14] Results computed over windows of (-1,0), (-2,+2) and (-5,+5) are similar to those for the (-1,+1) event window.

spin-offs are larger than non-focusing spin-offs[15], which is consistent with predictions of the focus theory. In this study we define a focus increasing spin-off when the parent-firm and subsidiary-firm operate in different two-digit Standard Industry Classification (SIC) codes.[16] Our results show that the average *CARs* of focus increasing spin-offs is 5.7%, significantly greater (at 10% level) than the 3.3% we detect for non-focusing spin-offs. However, there is no significant difference in the two groups' median *CAR*s. Second, when we split the sample between internally developed and previously acquired subsidiaries we find that previously acquired spin-offs exhibit much larger announcement effects. The difference of average *CARs* between the internally developed and previously acquired sub-groups is significant at the 5% level, but median *CARs* are not statistically different from each others. This result is consistent with the "correction-of-a-mistake" hypothesis of Allen *et al.* (1995). Third, we divide the sub-sample of internally developed spin-offs between focus and non-focus, and compute their respective *CARs*. Our findings show that there is no significant difference between mean and median announcement effects of focus and non-focus spin-offs when we condition on spin-off's origin. This result may also imply that the generally observed higher announcement effect of unconditional focusing spin-offs is probably affected by the higher announcement effect of previously acquired subsidiaries. In order to shed light on our conjecture, we split the sample of previously acquired spin-offs between focus and non-focus. Focus increasing spin-offs of previously acquired subsidiaries show a much higher announcement effect (+10,7%) than non focusing spin-offs of prior acquired units (-0,5%). The mean *CAR*s difference is statistically significant and confirms that the higher announcement effect of focusing spin-offs is mostly driven by the "correction-of-a-mistake" hypothesis. Fourth, we directly examine one implication of the corporate control theory which posits that announcement effects are increasing in the extent of takeover activity and that stock markets are able to anticipate that some spin-offs are undertaken to pursue a merger and acquisition strategy. In order to do that, we split our sample by parents that were or were not successively

[15] See for example, Daley, Mehrotra and Sivakumar (1997) and Desai and Jain (1999). However, more recently, Gertner, Powers and Scharfstein (2002) find insignificant differences in the announcement effects of a US sample of focusing- versus non-focusing spin-offs.

[16] To verify consistency of the focus-non focus spin-off classification we also use the Herfindahl index. Using Worldscope segment data on sales revenue on individual segments, we compute the index as the sum of squares of each segment's sales revenue as a proportion of total sales revenue. Focus increasing spin-offs are those with an increase in the Herfindahl index of the parent firm from the year before the announcement to the spin-off completion year. With both approaches we obtain the same classification between focus-increasing and non-focus increasing spin-offs.

merged or acquired in the three years following the spin-off completion year. Next, we also classify spin-offs that were or were not successively merged in the 3 years following the spin-off completion year.[17] Table 4 shows that although all these sub-groups exhibit statistically significant announcement mean and median *CARs*, all estimated differences are insignificant. Finally, we investigate whether there are differences across countries in sample on market reaction to spin-off announcements (results not reported). Although estimated *CARs* for each country in sample differ, we do not find any statistically significant difference.

The evidence on parent-firms announcement returns shows that the focus/non-focus distinction does not explain the market reaction on European spin-offs. Instead, our results indicate that a significant component of the focus-increasing explanation of announcement effects is driven by the much higher announcement gain generated by the spin-off of a previously acquired subsidiary, as predicted by the correction-of-a-mistake hypothesis. We also find some evidence of the impact of proxies for information asymmetries on stock prices changes. Taken together, we believe our results are consistent with the views proposed by the correction-of-a-mistake hypothesis and asymmetric information theory. There is no evidence that spin-offs announcement returns are somehow related to predictions of managerial incentives and corporate control theories.[18]

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[17] Table 4 shows that 13 parents (14% of whole sample) and 15 subsidiaries (15% of whole sample) were merged or taken over in the three years following the spin-off. These figures could be compared to Cusatis et al. (1993) who report that 14% of both parents and their subsidiaries were taken over or merged in the same time period following the spin-off. Similar figures are also reported by Desai and Jain (1999) for 15% of parents, and McConnell et al. (2001) for 13% of parents and 16% of subsidiaries. However, a control sample of European firms not involved in a spin-off in the five years surrounding (-2,..0,..+2) the spin-off announcement year (year 0) show in the same time period that 33% of parent control firms and 10% of subsidiary control firms are merged or taken over. It follows that parents in sample are less likely, and subsidiaries in sample are more likely to merge after the spin-off when compared to similar firms. Further, it is worth noting that our sample period is characterized by an increase of both domestic and cross-border mergers across European markets.

[18] A different approach to testing the focus-increasing hypothesis is to document the stock price effects for other firms in the same industry. The information conveyed by spin-off announcements may be relevant for rivals in at least two ways. First, the information may reflect economic conditions facing the industry as a whole. Second, the information may reflect change in the competitive balance within the industry. Thus, in principle, spin-offs announcements can have positive, negative or insignificant price effects on rivals. We implement this test by constructing a sample of parent rivals based on four-digit (or three-digit if four-digit is not available) SIC codes searching through the whole European databases of Datastream International, Global Vantage and Amadeus. We then run the event study and compute abnormal returns following the same methodology applied to parents in sample. We obtain the following results: a) rival firms show no significant price reaction when spin-offs are classified as either focus-increasing or non-focus-increasing; b) rival share prices are negatively and significantly affected when the announcement is related to internally developed subsidiaries; c) a positive – although statistically insignificant - price impact is observed for rival firms at the announcement of the spin-off of a previously acquired subsidiary. Furthermore, tests of mean and median differences between the sub-groups are all statistically significant at the 5% level. These results contradict the predictions of focus-increasing hypothesis and show some evidence that internally developed spin-offs are expected to generate efficiency

IV.E MULTIVARIATE ANALYSIS OF SPIN-OFF ANNOUNCEMENT RETURNS

In this section, we use multivariate regression models to test various theories explaining price effects associated with spin-off announcements. We select explanatory variables by following previous studies and inserting new control variables that are not yet tested in the spin-off literature.

The spin-off size is measured as the ratio of subsidiary market value at the end of spin-off completion month to the total firm value before the announcement (*RELSIZE*). Previous studies have shown that this variable is a significant factor in explaining parents announcement effects, and it is often associated with evidence of efficiency improvements from spin-offs. The focus (*FOCUS*) indicator is a dummy that is set to 1 if the parent and subsidiary have different two-digit SIC codes and is used to test the main prediction of focus increasing theory. Univariate evidence of shareholders' wealth creation in Table 4 have shown that share price changes associated with focus-increasing spin-offs are mostly influenced by the spin-off announcement of previously acquired subsidiaries operating in unrelated business. We control for this factor by adding an interaction dummy (*FOCUS PASTACQ*) which takes the value of 1 if the parent and subsidiary have different two-digit SIC codes and the subsidiary originated from a prior acquisition. In addition we insert further control variables: a dummy that takes the value of 1 if the subsidiary was created from parent's past acquisition (*PREVIOUSLY ACQUIRED SPIN-OFF*), the median industry (defined at two-digit SIC code level) Tobin's Q of both the parent-firm (*Q-PARENT INDUSTRY*) and subsidiary-firm (*Q-SPINOFF INDUSTRY*) at the end-of-month prior to spin-off announcement date. Further, we use a sales-based Herfindahl index (*HERFINDAHL*) to control for the claim that that parent-firm's announcement share price changes are related to the degree of firm diversification. We expect to find a negative relation between parent-firm announcement excess returns and the Herfindahl index, since the lower is the index the higher is the firm extent of diversification. Parents announcing a spin-off are typically refocusing and decreasing the degree of diversification, which should capture some further efficiency improvement expected at time of spin-off announcement.

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improvements, maybe at the expense of competitors. The rival firms weakly positive reaction to previously acquired spin-offs suggests that competitors may gain from the listing of these units, perhaps because of the future availability of potential target firms; a result that would be consistent with predictions of corporate control hypothesis. Rival firms announcement returns are not tabulated, however they are available from authors upon request.

The asymmetric information hypothesis predicts that value creation at spin-off announcement date should be larger when information asymmetries are larger before the break-up and the firm is more undervalued. We use the residual standard deviation of market-model-adjusted daily stock returns (*RESIDUAL STD*) in the event study estimation period (-220, -21) as the first proxy for the level of asymmetric information prior to spin-off announcement. Following Krishnaswami and Subramaniam (1999), in addition we use another measure of information asymmetry, namely the standard deviation of financial analysts' earnings forecasts made in the month preceding the spin-off announcement date (ANALYST STD FORECAST), as reported on the Institutional Brokers Estimate System (IBES) database.

The corporate control hypothesis predicts that announcement effects are related to the extent of takeover activity in the parent-firm and subsidiary-firm industries. We construct two types of variables to test the predicted positive relation between takeover activity and spin-off announcement effects. The first type is a dummy that takes 1 for either parents (PARENT MERGER DUMMY) or spin-offs (SPINOFF MERGER DUMMY) that were involved in a merger or were taken over in the three- year period following the spin-off completion month. The second variable is the ratio of corporate control transactions (€ million) in the twelve month prior to the spin-off announcement for European firms of same industry (2-digit SIC codes) to the grand total of all European corporate control transactions over the same time as reported in the Thomson One Banker Mergers and Acquisitions database. Our definition of corporate control transactions includes mergers, acquisitions and buyouts.

Two independent variables related to corporate governance effects are also inserted in the abnormal return regression models. The first variable is the La Porta *et al.* (1998) shareholder rights protection, which is a proxy for good governance (ANTIDIRECTOR RIGHTS). It predicts that the higher the country index the higher should be the market reaction to the spin-off announcement. The second variable is a dummy that takes the value of 1 if the parent-firm experienced top management turnover, board changes, outside shareholder pressures, and changes in management compensation plans in the 12-month period prior to spin-off announcement date (GOVERNANCE CHANGES). We expect a positive relation between recent governance changes and spin-off shareholder wealth effects. Finally, to control for possible country effects in our

geographically dispersed sample we insert country dummies for parents incorporated in Nordic countries (Denmark, Finland, Norway or Sweden) (COUNTRY DUMMY-Nordic) and UK and Ireland (COUNTRY DUMMY-UK & Ireland).

Table 5 reports the results of the multivariate analysis of determinants of spin-off announcement excess stock returns.

[Insert Table 5 about here **]**

The results show a positive relation between the cumulative abnormal returns and the spin-off relative size and alternative proxies of the asymmetric information hypothesis. In the latter case either the standard deviation of financial analysts' forecasts or the residual market model volatility enter the regression model with the expected sign and significant at conventional levels. On the contrary we find no significant relation between announcement effect and the refocusing dummy. Moreover, when we condition the refocusing dummy on previously acquired subsidiary, the variable becomes statistically significant at 5% level, confirming the univariate results of Table 4 that most of shareholder wealth effects of refocusing strategy is driven by larger share price changes following the announcement of previously acquired spin-offs. These results support predictions of the efficiency gain, the asymmetric information and the correction-of-a-mistake hypotheses. In contrast no support is found for the corporate control hypothesis.

IV.F. SPIN-OFF FIRMS LONG TERM STOCK RETURNS

Our main measure of spin-off efficiency improvements is based on abnormal stock returns observed up to three years after the transaction is completed. Further, we examine ex-post operating performance for the separated units, in order to provide a different perspective on spin-off efficiency improvements. In this section we focus on long term abnormal stock returns following the monthly calendar-time portfolio approach proposed by Fama (1998), and used by Mitchell-Stafford (2000) and McConnell *et al.* (2001). In the next section we present robustness tests that look at an alternative approach to measure long-run abnormal stock returns.

We create equally-weighted (EW) and value-weighted (VW) portfolios of parent-firms and subsidiary-firms each month from January 1993 to October 2006 that were involved in the spin-off transaction within the previous three years, and sample firms are

included in each portfolio starting from the spin-off completion-month (ex-month)[19]. We follow the Fama and French (1993) approach to construct the three risk factor regression model, as in equation (1):

$$R_{p,t} - r_{f,t} = a_p + b_p(R_{M,t} - r_{f,t}) + s_p\,SMB + h_p\,HML + \varepsilon_{p,t} \quad (1)$$

The market excess-return $(R_{M,t} - r_{f,t})$ is constructed as the difference between the value-weighted Morgan Stanley International Europe index and the one-month Euro interest rate (the corresponding German one-month interest rate is used as risk-free rate proxy from January 1993 to December 1998). The small minus big zero-investment portfolio (SMB) is computed as the difference between the value-weighted Morgan Stanley International Europe Small Cap index and the value-weighted Morgan Stanley International Europe index. The high BE/ME stocks minus the low BE/ME stocks zero-investment portfolio (HML) is computed as the difference between the value-weighted Morgan Stanley International Europe Value Stocks index and the value-weighted Morgan Stanley International Europe Growth Stocks index. Monthly returns are converted to Euro using DataStream exchange rate series.[20] Within the Fama and French (1993) framework the intercept, a_p, measures the portfolio average monthly abnormal return, and it is zero under the null hypothesis of no abnormal performance.

Table 6 reports the regression coefficient estimates for parent-firms. The results for the whole sample are presented in panel A, and show that the intercept is a monthly 0.5%, statistically significant for both EW and VW portfolios. This implies that investing in a portfolio of parent-firms undertaking a spin-off would have earned an average risk-adjusted return of over 19% over the 3-year holding period from the spin-off completion month. Panel B1 of Table 6 reports the results for the focus-increasing parents. Although intercept estimates are positive for both EW and VW portfolios, their *t*-statistics are not significant at 5% level. In the panel B2 we report the estimates for the non-focus-increasing parents. The results show a statistically significant 0.8% for the EW and an

[19] We exclude parent- and subsidiary-firm stock returns from 1989 to 1992 from our calendar-time portfolio tests because of small number of observations in those first four years.

[20] It is interesting to note that the European version of the Fama-French (1993) three factor model is statistically similar to the US version available in the Kenneth French's website. In the calendar-time portfolio regression sample period the risk factors' Spearman correlation coefficients are 0.78, 0.21 and 0.22 respectively for market excess return, SMB and HML. All correlation coefficients are significant at the 1% level. Moreover, mean and median monthly returns of European risk factors are not significantly different from the US Fama-French risk factors.

insignificant 0.6% for the VW portfolio. Panel C1 of Table 6 shows the estimates for the internally developed spin-offs. In this sample too we uncover a statistically significant intercept in the case of the EW portfolio, but a positive although insignificant estimate for the VW portfolio. Panel C2 of Table 6 shows the estimates for the previously acquired spin-offs, and none of the intercepts are significant at conventional levels. Panel D of table 6 reports results when conditioning on parents involved/not involved in merger and acquisition activity after the spin-off completion. There are very few cases of parents being acquired or merged subsequently to the spin-off, and we are not able to provide meaningful regression results for that sub-sample of parent-firms. However, panel D reports that parent-firms not involved in merger and acquisition transactions in the years following a spin-off generate positive long term excess returns. The estimates are statistically significant for the EW portfolio, and also positive although of lower significance level (10%) for the VW portfolio. Table 6 results of parent-firm long term stock returns are novel in the spin-off literature, but can be compared to earlier studies of spin-off long term returns using different empirical methods. Our findings do not confirm neither that parents involved in takeover activity are creating value in the long term (e.g. Cusatis *et al.* (1993)), nor that parents that increased their focus exhibit a positive and significant stock market performance following spin-offs (e.g. Desai-Jain (1999)). The results suggest instead that the parents that engage in a spin-off of either an internally developed subsidiary, or a close business segment (non-focusing), and avoid being involved in a merger exhibit higher and more significant long-term stock market performance in the three years following spin-offs.

[Insert Table 6 about here **]**

Table 7 reports the calendar-time regression coefficient estimates for subsidiary-firms. The results for spun-off units mostly mirror the findings for parent-firms, but are statistically more robust. Results for the whole sample presented in panel A show that the intercept is a highly significant monthly 0.7% for the EW portfolio and a 1.2% for the VW portfolio. Results for the VW portfolio imply that investing in a portfolio of spun-off firms would have earned an average risk-adjusted return of over 53% over the 3-year holding period from the spin-off completion month. Results reported in panel B2 for non focusing spin-offs, in panel C1 for internally developed subsidiaries and in panel D2 for spin-offs

not involved in merger and acquisition activity all show which spin-offs are creating value through long term stock returns. Our findings for spin-offs do not confirm past results that long term value creation is created through either takeover activity (e.g. Cusatis *et al.* (1993), or by undertaking focus increasing spin-offs (e.g. Desai-Jain (1999)).

[Insert Table 7 about here **]**

IV.G. ALTERNATIVE MEASURE OF LONG TERM ABNORMAL STOCK RETURNS

In this sub-section we examine long-term abnormal returns computed as buy-and-hold returns (BHARs) to check for robustness of the evidence provided by calendar-time regression tests and make our results comparable to previous research[21].

Fama (1998) and Mitchell-Stafford (2000) argue that the BHARs methodology could be severely flawed because it assumes independence of multi-year abnormal returns for event firms, producing test statistics that are typically too large. The source of test statistics bias is the cross-correlation of event firms, since many corporate actions are not random events, but typically cluster by industry and by time. Mitchell-Stafford (2000) examine three large samples of US mergers, equity offers and share repurchases and show that BHARs exhibit average positive correlation in all three samples. The average positive correlation is then affecting the statistical inference of BHARs, which assumes their independence. They propose to correct standard *t*-statistics by accounting for dependence in individual BHARs, and present evidence that abnormal returns show no statistical significance for the three event samples.

We are not aware of any attempt to examine the degree of BHARs cross-correlations using an international sample of corporate events. We follow the methodology proposed by Mitchell and Stafford (2000, Appendix, pp.326-328) to account for cross-correlation of individual BHARs in our sample of European spin-offs, and adjust

[21] BHARs are obtained from two different approaches. In the first, we apply a matching firm methodology by selecting a control-firm for each parent or subsidiary from the sample of firms that did not undertake a spin-off in the five years centered on the spin-off completion year (-2,..0,..+2), that is headquartered in the same geographic area (1) UK and Ireland; 2) Nordic Countries (Denmark, Finland, Norway and Sweden); and 3) Continental Europe (Belgium, Germany, Italy, Netherlands, Spain and Switzerland)), has the same two-digit SIC code and is closest in market value of equity (+/- 30%) and book-to-market ratio. If we do not find a matching firm in the same geographic area, we rely on the whole European data set to identify the closest firm by industry, market value of equity and book-to-market ratio. If the matching firm stock return data is missing (e.g. because of merger, going private, etc.), we replace it with the second closest matching firm, and so on, if subsequent missing data occurs. In the same way if a parent or a subsidiary firm in sample disappears from database, we replace it with returns time-series of the matched-firm. In the second approach we use as benchmark the firm's country market index. With this approach, missing stock return data for firms in sample are replaced with country market index returns from that point on.

accordingly the *t*-statistics. Our findings, however, differ from Mitchell and Stafford (2000). First, we uncover an average negative cross-correlation between individual BHARs of parent-firms (-0.007), and a slightly positive cross-correlation between individual BHARs of spin-off firms (0.005). Second, by applying the proposed correction method, *t*-statistics become almost two times higher in the case of parents BHARs, and about 19% lower for subsidiaries[22]. Our findings show that similar corporate events in international markets are less likely to be clustered by industry and by time, and the assumption of event independence is reasonable and would not significantly affect standard statistical inference.

Empirical results on long term abnormal returns for European parent-firms and subsidiary-firms following the spin-off highlight three relevant findings: 1) positive long-term stock returns are attributable to spun-off units; parents of spin-offs typically underperform benchmarks unless they are merged or taken over; 2) internally developed subsidiaries and units related to parent's business activity are the spin-offs which generate higher and highly significant abnormal returns in the long term; 3) at the pro-forma combined firm-level the transactions which earn higher (and some statistically significant) abnormal returns are those that separate an internally developed subsidiary. Our evidence differs from past US studies which find that either focus-increasing spin-offs (e.g. Daley *et al.* (1997) and Desai-Jain (1999)) or takeovers of either the parent or the subsidiary (Cusatis *et al.* (1993)) are the spin-off transactions which generate higher long-term stock returns. The interesting empirical result which emerges from long-term abnormal returns tests is the clear consistency of BHARs evidence and the findings using the calendar-time portfolio regression approach.

IV.H. SPIN-OFF FIRMS LONG TERM OPERATING PERFORMANCE

Previous section shows that internally developed subsidiaries and units operating in the parent industry are the spin-offs which outperform in the long run risk-adjusted benchmarks. This section explores two issues: 1) whether post-spinoff efficiency improvements are also evident at operating level; 2) whether measures of long-term operating performance are consistent with results of long-term stock returns. We compute two measures of operating performance, and our methodology follow early studies of post spin-off operating performance (e.g., Daley *et al.* (1997) and Desai and Jain (1999),

[22] Specifically, only three *t*-statistics of spin-off individual BHARs reduce their level of significance from 1% to 5%.

and incorporates the suggestions of methodological papers such as Barber and Lyon (1996) and Lie (2001).[23]

Our main findings are summarized as follows: [24] a) parent-firms do not show any improvement in operating performance after the spin-off is completed. This result holds using either benchmark and adopting different statistical methods; b) subsidiary-firms show statistically significant improvements in operating performance, starting in the spin-off completion year. The subsidiary operating efficient improvements are statistically higher than control firms' and median industry levels. Of various groups of spin-off firms, non-focusing and internally developed subsidiaries are those that show the higher and mostly significant levels of abnormal operating performance. For these two subgroups of corporate spin-offs, it's interesting to notice the clear link between long term excess stock returns and concurrent fundamental (accounting) performance. These results are in contrast with findings of early US studies of corporate spin-offs where the only subgroup of transactions which showed significantly improved operating performance after a spin-off is the focus-increasing one (e.g. Daley *et al.* (1997) and Desai-Jain (1999)). Furthermore, our results show that significant operating performance improvements are generated only at the subsidiary level and not within parent-firms.

V. CONCLUSIONS

This study helps to increase our understanding of the decision to spin-off a subsidiary and the economic consequences of spin-offs. We document that spin-off decisions in Europe are often triggered by firm's governance earth-quakes, such as an appointment of a new CEO or a takeover threat. These findings indicate that even in less active markets for mergers and corporate restructuring, break-up decisions are enforced by the monitoring activity of outside investors and capital markets. Our empirical study has shown that a significant component of stock price appreciation observed around spin-off announcement date is driven by the reverse of previous diversifying mergers. An

[23] The two measures of operating performance are the ratio of operating cash flow to the average of beginning- and ending-period book value of total assets (ROA) and the ratio of operating cash flow to total sales (ROS). To control for macroeconomic and industry effects we adjust both ROA and ROS using two different benchmarks: a) matched control-firm, and b) median industry operating performance. Matched control-firm is identified in the same way as described in section III.B. The median industry operating performance is obtained by selecting all European firms with the same 2-digit SIC code and computing the median operating performance within the subset of firms with the closest market value of equity (+/- 30%).

[24] To save space we do not present tables reporting BHARs results, but they are available from the authors upon request.

implication of our research is that care should be used in spin-off studies by identifying the subsidiary's origin; a characteristic that appears to be more relevant than classifying spun-off units into focus-increasing and non-focus-increasing. Finally, we show that long-run efficiency improvement of spin-offs is generated mostly by internally developed subsidiaries and parent-related units (non-focusing). These findings contrast the US evidence where focus-increasing spin-offs and spin-offs involved in subsequent mergers are those showing significant value creation and efficiency improvements.

In summary, our study shows that corporate spin-offs could be successful transactions when the parent-firm is divesting an internally developed unit, and we suggest that our results are consistent with the growing view that firm's corporate culture and individual managers' style can play an important role in corporate behaviour and economic performance.

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Table 1
Descriptive Statistics of Sample

This table is a description of the sample of 97 spin-offs announced and completed from January 1989 to June 2005 in twelve European countries. Spin-offs were first identified from Thomson ONE Banker Mergers and Acquisition Database and confirmed by searching Lexis-Nexis and national newspapers databases. The sample excludes spin-offs undertaken by parent-firms in regulated and financial industries. Market value and accounting data is obtained from DataStream. Panel A reports spinoff-parent firm's country of incorporation and selected statistics. Median Rel. Size is the median of the ratio of spin-off and parent-firm market values at the end of the month following completion date. Days to completion is the median number of days elapsing from spin-off announcement to ex-date. Non-Focus / Focus classification shows the number of spin-offs with the same / different 2-digit primary SIC code of the parent-firm. Internal Growth / Prev. Acquired split shows the number of spin-off subsidiaries that originated from the parent itself / were acquired by the parent-firm before the spin-off announcement.. Median MV refers to parent firm market value and is taken at the end of the month preceding the spin-off announcement date. Panel B presents descriptive statistics of selected financial variables for parent-firms and spin-offs and their control firms matched by geographic area, industry (2-digit SIC Code), size (within 70%-130% of parent's firm market value), and book-to-market that didn't undertake a spin-off in the five year period centered on the spin-off completion year. We define three geographic areas across Europe: 1) UK and Ireland; 2) Nordic Countries (Denmark, Finland, Norway and Sweden); and 3) Continental Europe (Belgium, Germany, Italy, Spain, Switzerland, and The Netherlands).. Market value is taken at the end of the month preceding the spin-off announcement date. B/M is the book-to-market ratio and is computed as the ratio of net tangible assets over market value. Operating income is total sales minus cost of goods sold and other expenses, before depreciation and amortization, and is measured as a ratio relative to the total assets. Investment ratio equals to the ratio of firm capital investment to total sales. Leverage is measured as the ratio of all debt to total assets. Residual standard deviation is the dispersion of the market-adjusted daily stock returns in the spin-off pre-announcement period (days -220,..,-21, where day 0 is the announcement day). Panel C reports summary statistics of the number of segments, Herfindahl index, Tobin's *Q* and the value of diversification discount for a sample of multi-segment parent-firms and matched control firms. Year t-1 is the year before the spinoff announcement, whereas year t0 refers to the spinoff completion year. Diversification discount/premium is computed as in Berger and Ofek (1995) by estimating the difference between the market value of the diversified firm and the sum of the imputed value of all the firm's segments, based on the sales-multiplier valuation method of the stand-alone firms. Significance of differences across groups is measured using a *t*-statistic for means and Wilcoxon signed-ranks test for medians (*p*-values reported in brackets).All value figures are million of 2005 Euros, using the EU-15 CPI index from DataStream.

Panel A: Distribution of the Sample by Country

	Belgium	Denmark	Finland	Germany	Ireland	Italy	Netherlands	Norway	Spain	Sweden	Switzerland	UK	Total
Total Number	5	2	1	3	4	5	2	3	1	15	4	52	97
Median Rel. Size (%)	17	27	82	6	58	64	52	27	5	19	29	33	31
Days to Completion	112	291	253	339	117	132	225	129	46	111	167	110	125
Non-Focus / Focus	3 / 2	2 / 0	0 / 1	2 / 1	1 / 3	2 / 3	0 / 2	3 / 0	0 / 1	3 / 12	2 / 2	18 / 34	36 / 61
Internal Growth/ Prev. Acquired	5 / 0	2 / 0	0 / 1	2 / 1	4 / 0	5 / 0	2 / 0	3 / 0	1 / 0	11 / 4	4 / 0	34 / 18	73 / 24

Table 1 (cont.)

Panel B. Summary Statistics of Parents, Spin-offs and Control Firms

	Parent firms			Control firms		
	Mean	Median	N	Mean	Median	N
Market Value of Equity (€M)	7260.7	1078.1	97	6930.4	793.3	97
Total Assets (€M)	6414.2	1256.7	95	7490.1	1175.5	95
Total Sales (€M)	4732.0	1649.7	95	5639.1	1191.2	95
B/M ratio	0.72	0.42	90	0.60	0.49	89
Operating Income ratio	0.06	0.07	95	0.07	0.08	94
Investment ratio	0.26	0.05	94	0.21	0.03	86
R&D to Sales ratio, %	1.61	0.00	95	1.43	0.00	95
Leverage	0.25	0.24	94	0.22	0.22	94
Residual Standard Deviation	0.02	0.02	97	0.02	0.02	97
	Spinoff firms			Control firms		
	Mean	Median	N	Mean	Median	N
Market Value of Equity (€M)	1251.2	235.9	89	1047.9	214.7	89
Total Assets (€M)	2060.6	344.0	80	2116.2	369.3	78
Total Sales (€M)	1334.0	386.4	79	1837.2	247.7	76
B/M ratio	0.78	0.52	76	0.69	0.54	75
Operating Income ratio	0.06	0.07	78	0.04	0.07	77
Investment ratio	0.22	0.05	75	0.21	0.05	71
R&D to Sales ratio, %	0.69	0.00	78	1.18	0.00	72
Leverage	0.25	0.22	80	0.21	0.20	76

Table 1 (cont.)

Panel C. Multi-Segment Parent-Firms and Control-Firms' Statistics

	Year	Statistics	Parent-Firms		Control Firms	
			Obs.	Value	Obs.	Value
Number of segments	t-1	mean	63	3.19	55	2.42
		median	63	3.00	55	2.00
	t0	mean	58	2.57	49	2.24
		median	58	2.00	49	2.00
		Diff. in means [medians], p-		0.006 [0.001]		0.456 [0.423]
Herfindahl index	t-1	mean	63	0.30	55	0.52
		median	63	0.20	55	0.51
	t0	mean	58	0.50	49	0.57
		median	58	0.43	49	0.54
		Diff. in means [medians], p-		0.001 [0.002]		0.479 [0.553]
Tobin's Q	t-1	mean	63	1.69	63	1.70
		median	63	1.34	63	1.31
	t0	mean	58	1.50	58	1.75
		median	58	1.23	58	1.38
		Diff. in means [medians], p-		0.281 [0.211]		0.800 [0.749]
Diversification Discount (-) Premium (+) (%)	t-1	mean	50	-40.2	38	-4.1
		median	50	-22.1	38	0.2
	t0	mean	48	-28.5	31	-0.1
		median	48	-30.0	31	2.3
		Diff. in means [medians], p-		0.522 [0.779]		0.366 [0.645]

Table 2
Corporate Control and Capital Structure events of Parent Firms

This table shows the total number and frequency of corporate control and capital structure events reported by the parent-firms announcing and completing spin-offs from January 1989 to June 2005 in twelve European countries and by matched control-firms. The period extends from the 12 months before the spin-off announcement month until 1 month after that announcement and the news search uses data from Lexis-Nexis and national newspapers databases. Control firms are matched by geographic area, industry, size, and book-to-market within firms that either didn't undertake a spin-off or originated from a spin-off in the five-year period centered at the spin-off completion year. We define three geographic areas across Europe: 1) UK and Ireland; 2) Nordic Countries (Denmark, Finland, Norway and Sweden); 3) Continental Europe (Belgium, Germany, Italy, Spain, Switzerland, and The Netherlands). Significance of mean-differences across groups is measured using a *t*-statistic.

	Parent firms		Control firms		Mean-diff.
	Obs.	in %	Obs.	in %	p-value
Management/Board turnover					
Turnover of CEO	32	33.33	10	10.42	0.01
Turnover of Board Chairman & President	19	19.79	19	19.79	1.00
Outside Shareholder Pressure					
Merger and/or controlling acquisition attempt	18	18.75	3	3.13	0.00
Activism by outside investors	13	13.54	6	6.25	0.09
New block-holder	12	12.50	10	10.42	0.65
Management Compensation					
New compensation plan	5	5.21	1	1.04	0.09
Financial Distress					
Dividend cut	17	17.71	10	10.42	0.15
Debt restructuring and/or refinancing	6	6.25	2	2.08	0.15
Liquidation	1	1.04	0	0.00	0.32
Restructuring and/or divestment activity					
Restructuring or divesting a division	57	59.38	23	23.96	0.00
Capital Structure Changes					
New debt issue	12	12.50	16	16.67	0.42
New equity issue	11	11.46	14	14.58	0.52
Summary					
At least on external control event	81	84.38	58	60.42	0.00

Table 3
Logit Regressions for the Determinants of the Spinoff Decision

This table provides the results of Logit regressions with the spinoff indicator (taking value of one for parent firms and zero for the control firms) as the dependent variable. The sample consists of 97 parent-firms and 97 control-firms. Parent-firms announced and completed a spin-off from January 1989 to June 2005 in twelve European countries. Spin-offs were first identified from Thomson ONE Banker Mergers and Acquisition Database and confirmed by searching Lexis-Nexis and national newspapers databases. The sample excludes spin-offs undertaken by parent-firms in regulated and financial industries. Control-firms are identified by matching firms by geographic area, industry, market value, and book-to-market ratio ROA (Return on Assets) is measured as the ratio of operating income (total sales minus cost of goods sold and other expenses, before depreciation and amortization) over total assets in the year before spin-off announcement date. HERFINDAHL index in the year before the announcement of the spin-off is computed as the sum of squares of each segment's sales revenue as a proportion of total sales revenue. SALES GROWTH is the average of three-year period before spin-off announcement date of the annual change in total sales. R&D is the average of three-year period before spin-off announcement date of the ratio of R&D expenses over total sales. CEO CHANGE is a dummy that takes the value 1 if the firm experienced a CEO Turnover in the year before the spin-off announcement date and zero otherwise. COMPENSATION PLAN is a dummy that takes the value 1 if the firm experienced a change in Management and Board compensation plans in the year before the spin-off announcement date and zero otherwise. TAKEOVER THREAT is a dummy that takes the value 1 if the firm experienced a merger and/or controlling acquisition attempt in the year before the spin-off announcement date and zero otherwise. ANALYSTS FORECAST is the forecast error of mean analyst estimate of firm earnings per share (source: I/B/E/S/) in the year preceding the spin-off announcement date. DIVERSIFICATION VALUE is computed as in Berger and Ofek (1995) by estimating the difference between the market value of the firm and the sum of the imputed value of all the firm's segments, based on the sales multiplier valuation method of the stand-alone firms. DIVESTITURES is the number of asset sales completed in the year preceding the spin-off announcement date. ACQUISITIONS is the number of acquisitions completed in the year preceding the spin-off announcement date. The χ^2 statistics (log-likelihood ratio) tests the null hypothesis that all the coefficients of the independent variables (except the constant) are equal to zero. Heteroskedasticity-consistent (White, 1980) standard errors are in parentheses under the parameter estimates. *, **, *** denote significance level, respectively, at the 10%, 5%, and 1%.

Table 3 (Cont.)

Dependent Variable: Spin-off indicator							
Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
CONSTANT	0.319 (0.345)	0.619** (0.325)	0.553* (0.331)	0.211 (0.449)	0.060 (0.600)	0.530 (0.346)	0.586 (0.328)
ROA	-2.045 (1.290)	-2.162* (1.245)	-2.180* (1.304)	-0.469 (2.143)	-0.382 (2.776)	-2.031* (1.228)	-2.031* (1.228)
HERFINDAHL	-0.718* (0.442)	-0.802* (0.445)	-0.941** (0.456)	-0.623 (0.496)	0.251 (0.919)	-0.714 (0.448)	-0.746* (0.443)
SALES GROWTH	0.909 (1.245)	0.997 (1.234)	0.784 (1.250)	1.503 (1.487)	2.298 (2.319)	1.053 (1.246)	0.802 (1.225)
CEO CHANGE	1.416*** (0.449)						
COMPENSATION PLAN		1.504 (1.217)					
TAKEOVER THREAT			2.250*** (0.769)				
ANALYSTS FORECAST				2.712 (1.978)			
DIVERSIFICATION VALUE					-0.486* (0.281)		
DIVESTITURES						0.119 (0.130)	
ACQUISITIONS							0.227 (0.226)
Number of observations	154	154	154	135	85	154	154
Pseudo-R^2	0.077	0.034	0.082	0.029	0.035	0.029	0.029
LR-Test (χ^2) *p*-value	0.002	0.124	0.001	0.241	0.398	0.191	0.180

Table 4
Spin-off Announcement-period Cumulative Abnormal Stock Returns

This table shows cumulative abnormal stock returns over a 3-day interval (-1,0,+1) around the day of spin-off announcement for a sample of 97 spin-offs announced and completed from January 1989 to June 2005 in twelve European countries. Spin-off announcement date was first identified from Thomson ONE Banker Mergers and Acquisition Database and confirmed by searching Lexis-Nexis and national newspapers databases. The sample excludes spin-offs undertaken by parent-firms in regulated and financial industries. Abnormal stock returns are computed based on one-factor market model residuals as in Brown and Warner (1985) estimated from day -220 to -21. Market model estimated parameters are adjusted using the Scholes-Williams (1977) procedure to take into account non-synchronous trading. Focus/Non-Focus classification shows the number of spin-offs with the different/same 2-digit primary SIC code of the parent-firm. Internally developed/Previously acquired classification shows the number of spin-offs which originated from parent-firm's internal growth/from parent-firm's past acquisition. Parent (or Subsidiary) M&A/no M&A within 3-year classification shows the number of parent-firms (or subsidiary-firms) which were either merged or involved in a full control acquisition/neither merged nor were acquired within the 3-year period following the spin-off completion month. Tests of significance (*Z*-statistic) of abnormal returns are done using the Dodd and Warner (1983) method of aggregating standardized abnormal returns. The significance of the difference in means and medians is assessed using the *t-test* adjusted for difference in sample variances and a nonparametric median test respectively. *, **, *** denote significance level at the 10%, 5%, and 1% respectively. Percentage of positive values is tested for significance using a binomial test. Announcement value-added creation is estimated by multiplying total market value of equity of the parent-firm at the end of month before the announcement date times the respective 3-day cumulative abnormal stock returns. The results are similar over (-1,0), (-2,+2) and (-5,+5) windows.

Spin-off classification	N	Mean	Median	Diff. in means	Diff. in medians	% positive
Whole sample	97	0.048***	0.027***			64.9***
Focus	61	0.057***	0.022***	0.024*	0.022	62.3**
Non-focus	36	0.033*	0.044***			69.4**
Internally developed	73	0.037***	0.022***	-0.042**	-0.024	64.4***
Previously acquired	24	0.079***	0.046***			66.7**
Internally developed only:						
-Focus	43	0.036***	0.013**	-0.005	-0.031	58.1
-Non-focus	30	0.041***	0.044***			73.3***
Previously acquired only:						
-Focus	18	0.107***	0.050***	0.112**	0.027	72.0***
-Non-focus	6	-0.005	0.023			50.0
Parent M&A within 3-year	13	0.036	0.023	-0.014	-0.005	61.5
No parent M&A	84	0.050***	0.028***			65.5***
Subsidiary M&A within 3-year	15	0.060**	0.041**	0.014	0.016	66.7
No subsidiary M&A	82	0.046***	0.025***			64.6***
Announcement Value-added creation (2005 €M)	97	26.8	8.3			

Table 5
Mulitivariate Tests of Spin-off Announcement-period Excess Returns

This table presents OLS regressions to explain parent-firms excess returns around the announcement date of a spin-off for a sample of 97 parent-firms that completed a spin-off from January 1989 to June 2005 in twelve European countries. Spin-offs and their announcement dates were first identified from Thomson ONE Banker Mergers and Acquisition Database and confirmed by searching Lexis-Nexis and national newspapers databases. The sample excludes spin-offs undertaken by parent-firms in regulated and financial industries. The dependent variable is the cumulative abnormal stock returns over a three-day interval (-1,0,+1) around the day of spin-off announcement. Abnormal stock returns are computed based on one-factor market model residuals as in Brown and Warner (1985) estimated from day -220 to -21. Market model estimated parameters are adjusted using the Scholes-Williams (1977) procedure to take into account non-synchronous trading. The independent variables are as follows: RELSIZE is the ratio of the subsidiary-firm market value to parent-firm market value; FOCUS is a dummy that takes the value 1 if the spun-off subsidiary 2-digit primary SIC code is different from the parent-firm's main SIC code and zero otherwise; FOCUS PASTACQU is a dummy that takes the value 1 if the spun-off subsidiary has a different 2-digit primary SIC code of the parent-firm and it originated from parent-firm's past acquisition and zero otherwise; PREVIOUSLY ACQUIRED is a dummy that takes the value 1 if the spun-off subsidiary originated from parent-firm's past acquisition and zero otherwise; *Q*-PARENT INDUSTRY is median Tobin's *Q* of all Western Europe firms with equal two-digit SIC codes to parent-firms and the end-of-month- before announcement date, and it is defined as the ratio of market value of equity plus book value of total assets less book value of equity and over book value of total assets; *Q*-SPINOFF INDUSTRY is median Tobin's *Q* of all Western Europe firms with equal two-digit SIC codes to subsidiary-firms and the end-of-month-before announcement date, and it is defined as the ratio of market value of equity plus book value of total assets less book value of equity and over book value of total assets; HERFINDAHL is the Herfindahl index before the announcement date and it is computed as the sum of squares of each segment's sales revenue as a proportion of total sales revenue; RESIDUAL STD is the residual standard deviation of the market-model adjusted daily stock returns in the spin-off estimation period (-220 to -21); ANALYST STD FORECAST is the standard deviation of all parent-firms earnings forecasts (from IBES) in the month preceding the spin-off announcement date; PARENT MERGER DUMMY is a dummy that takes the value 1 if the parent-firm merged or has been involved in a full control acquisition within the 3-year period following the spin-off completion month and zero otherwise; SPINOFF MERGER DUMMY is a dummy that takes the value 1 if the subsidiary-firm merged or has been involved in a full control acquisition within the 3-year period following the spin-off completion month and zero otherwise; PARENT MERGRESTR is the ratio of corporate control transactions (mergers, acquisitions and buyouts) reported in the Thomson One Banker Mergers and Acquisitions database for all Western Europe firms with same two-digit SIC codes of parent-firms over the grand total of European corporate control transaction in the twelve months before spin-off announcement date; SPINOFF MERGRESTR is the ratio of corporate control transactions (mergers, acquisitions and buyouts) reported in the Thomson One Banker Mergers and Acquisitions database for all Western Europe firms with same two-digit SIC codes of subsidiary-firms over the grand total of European corporate control transaction in the twelve months before spin-off announcement date; ANTIDIRECTOR RIGHTS is an index aggregating shareholders rights in the parent-firm country and it is computed following La Porta et al. (1998); GOVERNANCE CHANGES is a dummy that takes the value 1 if the parent-firm experienced either a Management/Board Turnover, or an Outside shareholder pressure or a change in management compensation plans as reported in Panel G of Table 1 in the 13-month period around spin-off announcement date and zero otherwise; COUNTRY DUMMY-Nordic is a dummy that takes the value 1 if the parent-firm country of incorporation is either Denmark, Finland, Norway or Sweden and zero otherwise; COUNTRY DUMMY-UK & Ireland is a dummy that takes the value 1 if the parent-firm country of incorporation is either United Kingdom or Ireland and zero otherwise. The *t*-statistics for the regression coefficients are reported in brackets and use the heteroskedasticity consistent standard errors of White's (1980). *, **, *** denote significance level, respectively, at the 10%, 5%, and 1%.

Table 5 (Cont.)

	Predicted sign	(1)	(2)	(3)	(4)	(5)
INTERCEPT		-0.006 [-0.41]	0.049 [0.82]	-0.053 [-1.57]	-0.054** [-1.93]	-0.028 [-0.52]
RELSIZE	+	0.072** [1.97]		0.103** [2.48]	0.097*** [2.40]	0.094*** [2.59]
FOCUS	+	0.015 [0.78]	-0.000 [-0.15]	0.023 [1.27]		
FOCUS PASTACQU	+				0.063* [1.73]	0.066** [2.21]
PREVIOUSLY ACQUIRED	+	0.009 [0.37]	0.001 [0.53]			
Q-PARENT INDUSTRY	+		-0.041 [-1.18]			-0.022 [-0.76]
Q-SPINOFF INDUSTRY	+		0.022 [0.92]			-0.012 [-0.57]
HERFINDAHL	-				-0.018 [-0.70]	
RESIDUAL STD	+			1.083 [0.83]	2.457** [2.02]	3.189*** [2.77]
ANALYSTS STD FORECAST	+	0.001*** [4.45]	-0.001 [-0.22]			
PARENT MERGER DUMMY	+	-0.032 [1.61]		-0.008 [-0.33]		
SPINOFF MERGER DUMMY	+	0.028* [1.76]		0.006 [0.30]		
PARENT MERGRESTR	+		-0.003* [-1.85]			
SPINOFF MERGRESTR	+		0.002 [0.81]			
ANTIDIRECTOR RIGHTS	+		0.002 [0.49]	0.008 [1.58]	0.005 [1.06]	0.005 [0.97]
GOVERNANCE CHANGES	+	-0.008 [-0.49]				-0.008 [-0.44]
COUNTRY DUMMY-NORDIC		-0.005 [-0.30]				
COUNTRY DUMMY-UK		-0.002 [-0.11]				
Number of observations		73	67	97	82	88
Adjusted R^2 (%)		7.1	-2.6	7.9	17.6	20.9
F-test *p*-value		0.13	0.61	0.04	0.001	<0.001

Table 6

Calendar-time Portfolio Regressions for Parent-firms

$$R_{p,t} - r_{f,t} = a_p + b_p(R_{M,t} - r_{f,t}) + s_p\, SMB + h_p\, HML + \varepsilon_{p,t}$$

This table presents calendar-time portfolio regressions using Fama-French (1993) three-factor model over the period after spin-off completion month for a sample of parent-firms that completed spinoffs from January 1989 to June 2005 in twelve European countries. Sample firms are included in a particular monthly portfolio from the month following (t+1) the spin-off completion month (t= ex-month), and the time series of calendar-time portfolio returns is from January 1993 to October 2006. R_M is the return on the value-weighted index of Europe in month t computed by Morgan Stanley International. $r_{f,t}$ is the 1-month Germany-EU Deutsche mark interest rate, observed at the beginning of the month and is obtained from DataStream (Series ECWGM1M). SMB is the return on small firms index minus the return on large firms index in month t and it is computed as the difference between the Morgan Stanley International Europe Small Cap and the Morgan Stanley International Europe. HML is the return on value stocks index minus the return on growth stocks index in month t and it is computed as the difference between the Morgan Stanley International Europe Value and the Morgan Stanley International Europe Growth. Where required, index and stock returns have been converted in Euro using Datastream exchange rate series. In regression model (1), the dependent variable is the excess return of the equally weighted portfolio of sample firms, $R_{p(EW)} - r_f$. In regression model (2), the dependent variable is the excess return of the value weighted portfolio of sample firms, $R_{p(VW)} - r_f$, using total market value at the beginning of the month. The *t*-statistics for the regression coefficients are reported in brackets and use the heteroskedasticity consistent standard errors of White's (1980). All significant intercepts at 5% or better are marked in **bold.**

	OBS	Average number of firms in portfolio	Regression Model	Constant $\hat{a}_i$	Europe Market Excess Return $\hat{b}_i$	Europe Small-Minus-Big Return $\hat{s}_i$	Europe High-Minus-Low Return $\hat{h}_i$	Adjusted $\overline{R}^2$ (%)
Panel A: All Parent-firms	166	34.4	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.005** [2.473]	0.936 [18.064]	0.534 [7.034]	-0.220 [-2.535]	71.7
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	**0.005** [2.028]	0.836 [12.003]	0.205 [2.132]	-0.029 [-0.280]	58.9
Panel B1: Focus-increasing Parent-firms	166	23.2	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	0.004 [1.768]	0.938 [15.300]	0.536 [6.180]	-0.251 [-2.457]	68.4
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.005 [1.849]	1.007 [13.539]	0.264 [2.732]	-0.265 [-2.249]	61.4

Table 6 (cont.)

	OBS	Average number of firms in portfolio	Regression Model	Constant $\hat{a}_i$	Europe Market Excess Return $\hat{b}_i$	Europe Small-Minus-Big Return $\hat{s}_i$	Europe High-Minus-Low Return $\hat{h}_i$	Adjusted $\overline{R}^2$ (%)
Panel B2: Non-Focus-increasing	166	11.2	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.008** [2.144]	0.882 [13.265]	0.374 [2.784]	0.049 [0.394]	42.5
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.006 [1.723]	0.669 [6.919]	0.112 [0.804]	0.345 [2.357]	40.7
Panel C1: Internally developed subsidiary	166	22.8	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.005** [2.341]	1.013 [22.271]	0.526 [6.724]	-0.274 [-3.157]	71.8
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.005 [1.724]	0.980 [8.489]	0.253 [2.020]	-0.226 [-1.416]	54.7
Panel C2: Previously acquired subsidiary	166	11.6	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	0.004 [1.493]	0.754 [8.276]	0.385 [3.347]	0.033 [0.254]	45.6
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.006 [1.784]	0.585 [6.468]	0.055 [0.451]	0.265 [1.846]	34.5
Panel D: No M&A within 3-year	166	32.3	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.005** [2.176]	0.922 [18.304]	0.476 [6.457]	-0.175 [-1.956]	71.2
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.004 [1.544]	0.774 [13.544]	0.061 [0.745]	0.039 [0.396]	56.9

Table 7
Calendar-time Portfolio Regressions for Subsidiary-firms

$$R_{p,t} - r_{f,t} = a_p + b_p(R_{M,t} - r_{f,t}) + s_p\, SMB + h_p\, HML + \varepsilon_{p,t}$$

This table presents calendar-time portfolio regressions using Fama-French (1993) three-factor model over the period after spin-off completion month for a sample of spin-offs completed from January 1989 to June 2005 in twelve European countries. Sample firms are included in a particular monthly portfolio from the month following (t+1) the spin-off completion month (t= ex-month), and the time series of calendar-time portfolio returns is from January 1993 to October 2006. R_M is the return on the value-weighted index of Europe in month t computed by Morgan Stanley International. $r_{f,t}$ is the 1-month Germany-EU Deutsche mark interest rate, observed at the beginning of the month and is obtained from DataStream (Series ECWGM1M). SMB is the return on small firms index minus the return on large firms index in month t and it is computed as the difference between the Morgan Stanley International Europe Small Cap and the Morgan Stanley International Europe. HML is the return on value stocks index minus the return on growth stocks index in month t and it is computed as the difference between the Morgan Stanley International Europe Value and the Morgan Stanley International Europe Growth. Where required, index and stock returns have been converted in Euro using Datastream exchange rate series. In regression model (1), the dependent variable is the excess return of the equally weighted portfolio of sample firms, $R_{p(EW)} - r_f$. In regression model (2), the dependent variable is the excess return of the value weighted portfolio of sample firms, $R_{p(VW)} - r_f$, using total market value at the beginning of the month. The *t*-statistics for the regression coefficients are reported in brackets and use the heteroskedasticity consistent standard errors of White's (1980). All significant intercepts at 5% or better are marked in **bold.**

	OBS	Average number of firms in portfolio	Regression Model	Constant $\hat{a}_i$	Europe Market Excess Return $\hat{b}_i$	Europe Small-Minus-Big Return $\hat{s}_i$	Europe High-Minus-Low Return $\hat{h}_i$	Adjusted $\overline{R}^2$ (%)
Panel A: Spin-off Whole Sample	166	34.4	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.007** [3.125]	0.833 [16.749]	0.678 [6.846]	-0.233 [-2.509]	67.6
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	**0.012** [5.674]	0.777 [16.525]	0.100 [1.365]	-0.106 [-1.007]	61.8
Panel B1: Focus-increasing	166	23.7	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	0.004 [1.621]	0.840 [14.107]	0.618 [5.188]	-0.214 [-1.914]	58.9
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.003 [0.845]	0.666 [8.665]	0.272 [1.848]	-0.137 [-0.908]	32.7

Table 7 (cont.)

	OBS	Average number of firms in portfolio	Regression Model	Constant $\hat{a}_i$	Europe Market Excess Return $\hat{b}_i$	Europe Small-Minus-Big Return $\hat{s}_i$	Europe High-Minus-Low Return $\hat{h}_i$	Adjusted $\overline{R}^2$ (%)
Panel B2: Non-Focus-increasing	166	10.8	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.013** [4.699]	0.821 [12.354]	0.786 [6.357]	-0.279 [-1.782]	57.5
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	**0.016** [5.250]	0.883 [10.908]	0.108 [1.057]	-0.182 [-1.227]	48.2
Panel C1: Internally developed subsidiary	166	24.0	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.011** [4.087]	0.822 [14.439]	0.718 [6.242]	-0.237 [-2.385]	58.1
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	**0.013** [5.234]	0.827 [14.715]	0.049 [0.562]	-0.157 [-1.252]	52.5
Panel C2: Previously acquired subsidiary	166	10.4	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	-0.002 [-0.497]	0.843 [11.455]	0.560 [4.439]	-0.179 [-1.226]	48.2
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	0.006 [1.548]	0.598 [6.426]	0.216 [1.303]	0.212 [1.194]	29.2
Panel D: No M&A within 3-year	166	32.3	*Model 1- Equally weighted portfolio* $R_{p(EW)} - r_f$	**0.007** [2.972]	0.860 [16.648]	0.652 [6.126]	-0.215 [-2.255]	67.5
			Model 2- Value weighted portfolio $R_{p(VW)} - r_f$	**0.011** [5.512]	0.824 [16.396]	0.107 [1.332]	-0.113 [-1.021]	62.6

Appendix I. Variables definitions.

VARIABLE	DEFINITION	DATA SOURCE
ACQUISITIONS	Total number of acquisitions completed by the firm in the year preceding the spin-off announcement date.	Thomson One Banker
ANALYSTS FORECAST	Forecast error of mean analyst estimates of firm's earnings per share in the year preceding the spin-off announcement date.	I/B/E/S
ANALYST STD FORECAST	Standard deviation of firms' earnings forecasts in the month preceding the spin-off announcement date.	I/B/E/S
ANTIDIRECTOR RIGHTS	Index of aggregated shareholders rights protection for the firm's country of incorporation.	La Porta *et al.* (1998)
CEO CHANGE	Dummy that takes value of 1 if the firm experienced a CEO turnover in the year before the spin-off announcement date and zero otherwise.	LexisNexis
COMPENSATION PLAN	Dummy that takes value of 1 if the firm experienced a change in management and board compensation plans in the year before the spin-off announcement date and zero otherwise.	LexisNexis
COUNTRY DUMMY-NORDIC	Dummy that takes value of 1 if the firm's country of incorporation is either Denmark, Finland, Norway or Sweden and zero otherwise.	Own computations
COUNTRY DUMMY -BRITISH	Dummy that takes value of 1 if the firm's country of incorporation is either United Kingdom or Ireland and zero otherwise.	Own computations
DIVERSIFICATION VALUE	The value of diversification discount computed as in Berger and Ofek (1995) by estimating the difference between the market value of the firm and the sum of the imputed value of all the firm's segments, based on the sales multiplier valuation method of the stand-alone firms.	WorldScope, own computations
DIVESTITURES	Total number of asset sales completed by the firm in the year preceding the spin-off announcement date.	Thomson One Banker
FOCUS	Dummy that takes value of 1 if the spin-off subsidiary's 2-digit primary SIC code is different from the parent-firm's main SIC code and zero otherwise.	Thomson One Banker, WorldScope, Amadeus
FOCUS PASTACQU	Dummy that takes value of 1 if the spin-off subsidiary has a different 2-digit primary SIC code from the parent-firm and is originated from parent-firm's past acquisition and zero otherwise.	Own computations
GOVERNANCE CHANGES	Dummy that takes value of 1 if the parent-firm experienced either a Management/Board turnover, or an outside shareholder pressure or a change in management compensation plans as reported in Panel G of Table 1 in the 13-month period around spin-off announcement date and zero otherwise.	LexisNexis
GROWTH	Average annual growth rate of net sales of the company during the three years before the spin-off announcement.	DataStream, own computations
HERFINDAHL	HERFINDAHL index in the year before the announcement of the spin-off computed as the sum of squares of each segment's sales revenue as a proportion of total sales revenue.	WorldScope, own computations
PARENT MERGER DUMMY	Dummy that takes value of 1 if the parent-firm merged or has been involved in a full-control acquisition within the 3-year period following the spin-off completion month and zero otherwise.	LexisNexis
PARENT MERGRESTR	Ratio of total number of corporate control transactions (mergers, acquisitions and buyouts) for all Western Europe firms with same two-digit SIC codes of parent-firms over total number of European corporate control transaction in the twelve months before spin-off announcement date.	Thomson One Banker
PREVIOUSLY ACQUIRED	Dummy that takes value of 1 if the spin-off subsidiary originated from parent-firm's past acquisition and zero otherwise.	LexisNexis
Q-PARENT INDUSTRY	Median Tobin's *Q* of all Western Europe firms with same two-digit SIC code of the parent-firm at the end of month before	DataStream, own computations

	announcement date. Tobin's Q is estimated as the ratio of market value of equity plus book value of total assets less book value of equity and over book value of total assets.	
Q-SPINOFF INDUSTRY	Median Tobin's *Q* of all Western Europe firms with same two-digit SIC code of the spin-off subsidiary at the end of month before announcement date. Tobin's Q is estimated as the ratio of market value of equity plus book value of total assets less book value of equity and over book value of total assets.	DataStream, own computations
R&D	Average ratio of R&D expenses over total sales for the three years before spin-off announcement date.	DataStream, own computations
RELSIZE	Ratio of the subsidiary-firm market value to parent-firm market value.	DataStream, own computations
$RELSIZE^2$	RELSIZE variable squared.	Own computations
RESIDUAL STD	Residual standard deviation of the market-model adjusted daily stock returns in the spin-off estimation period (-220 to -21).	DataStream, own computations
SEGMENTS	Number of segments of the company at 3-digit SIC Code level in the year before the announcement of the spin-off.	WorldScope
SPINOFF MERGER DUMMY	Dummy that takes value of 1 if the subsidiary-firm merged or has been involved in a full control acquisition within the 3-year period following the spin-off completion month and zero otherwise.	LexisNexis
SPINOFF MERGRESTR	Ratio of total number of corporate control transactions (mergers, acquisitions and buyouts) for all Western Europe firms with same two-digit SIC codes of spin-off subsidiary over total number of European corporate control transaction in the twelve months before spin-off announcement date.	Thomson One Banker
STOCK RETURN	Total stock return (including cash dividends) net of country market index return in the year before spin-off announcement date.	DataStream, own computations.
TAKEOVER THREAT	Dummy that takes value of 1 if the firm experienced a merger and/or controlling acquisition attempt in the year before the spin-off announcement date and zero otherwise.	LexisNexis