Spinoffs Versus Buyouts:
Profitability of Alternate Routes for Commercializing Innovations

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ABSTRACT
This research compares innovation-related spinoffs and buyouts. Innovation-related divestitures are companies created with the intent of better developing and marketing new products in new or existing markets. We investigate how and why spinoffs’ and buyouts’ strategic emphasis, radicalness of products, and profits diverge over time. Using longitudinal data on 126 spinoffs and 102 buyouts over 5 years, this study provides three critical findings. First, spinoffs and buyouts have similar profits in the first two years after divestiture; afterwards buyouts have much higher profits than spinoffs. Second, divestiture type influences performance through two routes: a one-step mediated effect via strategic emphasis; and a two-step mediated effect via strategic emphasis and radicalness. The two routes have opposite effects on performance. Third, strategic emphasis is the central, causal mechanism that generates heterogeneity in the evolution of spinoffs’ and buyouts’ performance.

Keywords: Spinoffs, management buyouts, agency theory, radicalness, innovation, R&D and marketing investments.
INTRODUCTION

In the 1970s, Xerox PARC had working prototypes of a number of products of the computer age. However, the firm did not commercialize them for fear of cannibalizing its existing copying business. Similarly, in the 1990s, despite huge investments in R&D, Polaroid did not introduce a digital camera for fear of cannibalizing its instant-film business (Tripsas and Gavetti, 2000). Generally, large corporations develop numerous innovations but do not commercialize many of them due to a fear of cannibalizing existing products (Chandy and Tellis, 1998) or excessive focus on current customers (Christensen and Bower, 1996).

Rather than abandoning these opportunities, parent firms can divest the unit that developed the innovation. By so doing the parent can set the unit free to explore promising opportunities that the parent does not want to pursue from within (Zahra, 1995). In this way, the parent can limit the risk of commercializing a new product, while keeping the option to capitalize on success should it occur (Moschieri and Mair, 2008). We define these divestitures that are created with the intent of better developing and commercializing new technologies or products in new or existing markets as “innovation-related divestitures”. This form of inside-out open innovation has become very popular in the last few years (Chesbrough and Garman, 2009).

This paper investigates two of the most common types of divestitures: spinoffs and buyouts. Over the years firms have been swinging between the two types in an effort to find the optimal form that maximizes innovation and performance. Buyouts were very popular in the ‘80s, but their number felt sharply in the ‘90s (Wright, Wilson, Robbie, and Ennew, 1996). The last ten years witnessed a proliferation of spinoffs (Chesbrough and Garman, 2009). For example, in the last quarter of 2010, the value of global spinoff deals was $142 billion (The Spinoff Report), three times higher than the value of global buyout deals at $56.7 billion (Merge Market 2011).
Despite their popularity, little is known about the long-term implications of spinoffs and buyouts. Several scholars have wondered why spinoffs are often greeted with positive investor responses initially even though the long-term performance is frequently not realized (Semadeni and Cannella, 2011). Similarly, many scholars have described buyouts as a short-term therapy whose long-term effects are unclear (e.g., Long and Ravenscraft, 1993). This research void has urged scholars to call for a systematic investigation of divested units’ innovation strategy and long-term performance (Moschieri, 2011; Semadeni and Cannella, 2011; Zahra, 1995).

Even though firms may decide on spinoffs and buyouts for different reasons, we focus on their performance after the divestiture, while also controlling for the differences prior to divestiture, via the Heckman two stage model. Also, even though spinoffs and buyouts are of different types (that we will describe later), we focus on one specific type of divestiture, namely innovation-related ones. By these definitions, innovation-related spinoffs and buyouts share the same purpose: To develop innovations that would not be possible while inside the parent company. Specifically, this study seeks to answer the following research questions: First, how do innovation-related spinoffs and buyouts differ in terms of strategic emphasis, radicalness, and performance? Second, how do differences along these variables evolve over time? Third, what factors explain the performance over time of innovation-related spinoffs and buyouts? For the sake of simplicity, now on we call innovation-related divestitures simply spinoffs or buyouts.

We use agency theory to develop our theoretical framework. In fact, innovation contexts are characterized by particularly severe agency conflicts (He and Wang, 2010). The ways these conflicts are managed influence firm’s performance. Spinoffs and management buyouts maximally differ in terms of ownership and capital structures, two elements that according to agency theory determine the way agency conflicts are managed (Jensen 1986; Jensen and Meckling, 1976). Hence, agency theory
provides a theoretical foundation to understand why these two types of divestitures differ in terms of performance. Further, agency theory is “the most prominent explanation” of post-divestiture outcomes (Moschieri and Mair 2008, p. 401).

Drawing from the agency theory, we test and posit that strategic emphasis (i.e., the relative amount of resources that a divestiture invests in R&D over marketing) is a causal mechanism that explains why spinoffs and buyouts’ performance differ in the long-run. We focus on investments in R&D and marketing because the prior literature has indicated that these are the two most important investments for innovation (Danneels, 2002; Dutta, Narasimhan, and Rajiv, 1999). Also, the prior literature has indicated that the pattern of resources allocation between R&D and marketing determines the radicalness of the products that divestitures commercialize (Christensen & Bower, 1996) and in turn their performance (Sorescu, Chandy, and Prabhu, 2003).

We test our hypotheses using longitudinal data on 126 spinoffs and 102 buyouts that occurred in the US between 1996 and 2004. This research makes three contributions to the literature. First, it shows how spinoffs’ and buyouts’ performance diverge over time. We find that spinoffs and buyouts have similar profits in the first two years after divestiture, but afterwards buyouts have much higher profits than spinoffs. Second, it shows why spinoffs’ and buyouts’ performance diverge over time. We identify two routes through which divestiture type influences performance: a one-step mediated effect via strategic emphasis; and a two-step mediated effect via strategic emphasis and radicalness. The two routes have opposite effects on performance. Third, it identifies in strategic emphasis the central, causal mechanism that generates heterogeneity in the evolution of spinoffs’ and buyouts’ performance. We find that strategic emphasis fully mediates the effect of divestiture type on performance.
THEORY AND HYPOTHESES

This section develops the theoretical framework and derives our hypotheses.

Theoretical framework

This section covers four issues: the distinction between spinoffs and management buyouts; agency problems in innovation-related divestitures; strategic emphasis; and the effect of ownership and capital structures on strategic emphasis. Figure 1 summarizes the key constructs and their relationships.

Spinoffs versus Management Buyouts

A spinoff occurs when a corporation distributes pro rate the shares of a subsidiary to the parent firm shareholders, thus creating a publicly-traded company to continue the operations of the division or subsidiary (Semadeni and Cannella, 2011). A management buyout occurs when a corporation sells a subsidiary to an investor group that includes the managers of that organization, thus creating a private company set up to continue the operations of the division or subsidiary (Pe’er and Gottschalg, 2011). For brevity, we refer to them henceforth as buyouts.

Spinoff and buyouts maximally differ in terms of ownership and capital structures. As for ownership structure, spinoffs are characterized by a separation between owners and managers, who act as agents of the owners; buyouts do not present such separation in that managers own a consistent stake of the new venture. As for capital structure, buyouts are characterized by initially high equity/debt ratios in that they do not raise public capital but incur debt; spinoffs tend to have a lower equity/debt ratio because they mainly raise capital in the stock market and do not have resort to debt.

Ownership structure “represents a source of power that can be used to either support or oppose management depending on how it is concentrated and used” (Salancik and Pfeffer, 1980: 655). It influences a firm’s strategic choices, such as the deployment of innovation assets (He & Wang,
2009), R&D strategy (Baysinger, Kosnik, & Turk, 1991), and diversification (Parthiban, O’Brien, Yoshikawa, & Delios, 2010). The convergence of interest hypothesis suggests that management ownership, namely the share of a firm that managers own, induces managers to reduce opportunism by aligning managers’ interests with those of owners (Jensen and Meckling, 1976). The expectation that managers’ financial outcomes are strongly tied with the firm’s financial outcomes should lead managers to behave in the best interest of the company and its shareholders. Research has shown that management ownership can align managers’ and owners’ interests with respect to merger decisions (Lewellen, Loderer, & Rosenfeld, 1985), risk taking (Wright, Ferris, Sarin & Awasthi, 1996), and support for corporate entrepreneurship (Zahra, Neubaum, & Huse, 2000).

As for capital structure (i.e., the mix of debt and equity maintained by a firm), the control hypothesis (Jensen, 1986) suggests that high debt constrains managers to return excess cash flow to the owners rather than overindulge in projects that would increase managers’ utility at the owners’ expense. Increasing the debt to equity ratio (i.e., leverage) helps firms ensure that managers are managing the firm in the agents’ best interest because excess funds must be used to repay the debt rather than on perks and pet projects. High debt/equity ratios induce managers to act according to the owners’ interests through the threat of bankruptcy, which causes personal losses to managers through loss of salaries, reputation, perquisites, job, etc. (Grossman and Hart 1982). Research has shown that higher debt/equity ratios can mitigate conflicts between owners and managers concerning the amount of risk to undertake (Jensen & Meckling, 1976), investments choice (Myers, 1977), and dividend policy (Stulz, 1990).

*Agency Problems in Innovation-Related Spinoffs and Buyouts.*

Agency theory maintains that managers and owners have conflicting interests and different risk tolerances (Eisenhardt, 1989): owners are more tolerant of risk than managers. The reason is that
owners can diversify risk over their portfolio of investments; managers cannot easily leave their jobs if risky projects turn sour. Agency problems arise when information asymmetry between the two parties allows managers to exercise discretion in the allocation of resources (He & Wang, 2009); managers tend to behave opportunistically by allocating resources in ways that maximize their utility rather than the owners’ wealth (Eisenhardt, 1989).

Agency problems are likely to be particularly grave in innovation-related spinoffs and buyouts. First, divestitures’ products are still at the embryonic stage and managers have to choose among multiple avenues to grow new products. Even if managers choose with the company’s best interest at heart, the emergence of new technologies or changes in consumer tastes might still negatively influence the innovation performance in the marketplace. The fact that innovation activities vary greatly in their outcomes makes it difficult for owners to distinguish between managers’ opportunistic behavior and unfortunate circumstances (Wiseman & Gomez-Mejia, 1998). Second, managers might be reluctant to disclose valuable information about innovation to owners for fear of such precious information leaking to competitors (Bhattacharya & Ritter, 1983; Lee & O’Neill 2003). The impossibility to discern between opportunistic behavior and bad luck, coupled with the necessity to maintain information asymmetry create great ambiguity in the means-ends relationship and ignite agency problems.

From an agency-theoretic perspective, such greater ambiguity provides managers with more freedom to pursue self-interested agendas (Jensen & Meckling, 1976). Traditional “surveillance mechanisms”, such as accounting measures of performance, used to evaluate managers’ behaviors, are likely to be rather noisy for divestitures’ innovation activities (Balkin, Markman, and Gomez-Mejia, 2000; He and Wang, 2009). In these contexts, ownership and capital structures gain relevance as the two main means through which agency conflicts are managed in innovation contexts (He and
Wang, 2009; Long and Ravenscraft, 1993). Because resource allocation is at the core of agency conflicts (He and Wang, 2009; Jensen, 1986), we focus on strategic emphasis, namely how managers allocate resource between two critical innovation investments: R&D and marketing.

**Divestitures’ Strategic Emphasis on R&D versus Marketing Investments.**

Firms involved in innovation must allocate resources to two complementary yet strategic investments: R&D and marketing (Danneels, 2002; Dutta et al., 1999). R&D investments are fundamental to develop the internal technological knowledge necessary to innovate as well as to acquire, assimilate and use external technological knowledge (Cohen and Levinthal 1990). Because part of the valuable assets of a unit is lost during a divestiture (Moschieri, 2011), the capability to develop new knowledge is vital to replete the know-how lost during the divestiture.

Marketing investments help firms build strong relationships with customers and develop market knowledge about their needs (Kor and Mahoney, 2005). The emphasis on methods that put customers and users at the center of the innovation process (Von Hippel, 1986) shows that marketing investments further enhance innovation activities (Moorman and Slotegraaf, 1999). The embryonic stage of technologies and markets, in which innovation-related divestitures typically operate, creates uncertainty about which final product configuration consumers will like the most. Marketing investments are fundamental to enable the divestiture to predict consumer preferences and set the right direction for the innovation processes (Song, Droge, Hanvanich and Calantone, 2005).

We define strategic emphasis as the relative amount of resources that a divestiture invests on R&D over marketing (Mizik and Jacobson, 2003). R&D and marketing investments differ along two critical aspects: payoffs uncertainty and investment horizons. R&D investments have highly uncertain payoffs, ranging from no payoffs to payoffs only after many years (Lee and O’Neill, 2003). Marketing investments produce more certain, immediate payoffs than do R&D investments.
(Steenkamp and Fang, 2011). Further, R&D investments lead to value creation through the development of new products. Marketing investments also contribute to value creation by helping firms to develop products that meet consumer needs. However, they mainly lead to value appropriation by creating isolating mechanisms (e.g., brand equity) that protects divestiture’s performance from competitors (Kor and Mahoney, 2005; Mizik and Jacobson, 2003).

While ideally firms should invest in both R&D and marketing, the limited amount of resources available to firms forces companies to choose between the two. Thus, strategic emphasis involves an inter-temporal trade-off between the appropriation of a secure performance in the short-term (marketing investments) and the chance of creating value in the long-run (R&D investments). Divestitures with high strategic emphasis tend to sacrifice short-term gains for long-term performance. Because ownership and capital structures influence the riskiness and investment horizon of a divestiture’s investments, we argue that different ownership and capital structures should cause spinoffs and buyouts to have different strategic emphases. We now examine how ownership and capital structures influence strategic emphasis in spinoffs and buyouts.

The effect of ownership structure on strategic emphasis
When managers and owners are two separate actors (i.e., in spinoffs), three forces work against investments in R&D and in favor of marketing investments. First, the uncertainty of R&D investments makes it difficult for owners to know their value (Lee and O’Neill, 2003). On the other hand, managers may be reluctant to disclose details about R&D investments to owners for fear of information leakage to competitors (Bhattacharya and Ritter, 1983). Thus, owners may perceive that they have little control over R&D investments, which will yield payoffs only in the long-term. Marketing investments, instead, are more controllable because they produce more immediate results. The fact that investments with more visible outcomes cause fewer agency problems would lead
owners to prefer investments in marketing over R&D. Second, information asymmetry between owners and managers provides the latter with an incentive to cut long-term investments in order to increase the divestiture’s current performance and its current returns (e.g., higher pay, bonuses, etc.) at the cost of future performance (Stein, 1989). Because R&D investments take a longer time to pay off than marketing investments (Steenkamp and Fang, 2011), managers would prefer to invest in marketing more than in R&D.

Third, when ownership and control are separate, managers have to report to a board of directors and to stockholders. The board monitors that managers’ actions are consistent with the owners’ interests. Monitoring, however, is particularly challenging in innovation contexts due to the ambiguous nature of strategy formulation in these contexts (He and Wang 2009). The board of directors would hence look for clear signals that can reliably assess managers’ effort and performance (Baysinger and Hoskisson, 1990). For this reason, the board would favor marketing investments that are more easily controllable and provide a more immediate chance of evaluating managers’ performance than R&D investments. The fact that public companies have to report to the board of directors and stock markets have long been indicated as a cause of chronic R&D under-investments (Bushee 1998; Drucker 1986; Jacobs 1991; Porter 1992). Summarizing, the compound of owners’ need for control, managers’ inter-allocation of earning, and board of directors’ monitoring would lead divestitures to invest more in marketing than R&D when management and ownership are separate (i.e., in spinoffs).

When managers own part of the company (i.e., in buyouts) the tendency to favor marketing over R&D is less evident. Owners-managers are more prone than owners to invest in R&D as they are better able to detect the real value of R&D projects. Also, the other owners who do not manage the company are more confident that managers act in the best interest of the company when managers
own part of it. Thus, divestitures with owner-managers are more prone to accept R&D investments.

Further, owners-managers are motivated to trade-off immediate appropriation of performance for the creation of value (Zahra, Neubaum and Huse, 2000). In fact, their long-term relationship with the divestiture guarantees that owners-managers will be around to reap the benefits of the value they created when it finally turns into performance gains. To the extent that R&D investments have a higher potential to create value for the firm than marketing investments (Steenkamp and Fang, 2011), R&D investments are likely to be more attractive for owners-managers. Finally, when managers own part of the company the board of directors exercises a less stringent control. The board does not need to look for clear signals of managers’ commitment to serve the owners’ interests, since the two actors are the same. Thus, the board’s preference for marketing investments becomes less evident when managers own part of the firm. For these reasons, we conclude that when managers are also owners (i.e., in buyouts), divestitures strategically emphasize R&D versus marketing investments.

The effect of capital structure on strategic emphasis

As the debt/equity ratio increases, the power of a third category of actors – debt-holders – rises. In divestitures with high debt/equity ratio two forces work against investments in R&D and in favor of marketing investments. First, debt-holders overestimate the risk of failure and undervalue payoffs because they do not have all the information necessary to understand the real value of investments (Long and Ravenscraft, 1993). Since they bear the downside risk and not the upside gains, debt-holders are hesitant to fund risky investments. They would prefer investments in marketing over R&D because the former have more secure outcomes than R&D investments.

Second, debt-holders prefer investments in activities that generate rapid cash flows that can be used to repay the debt (Jensen, 1986). As marketing investments generate more immediate payoffs than R&D investments, debt-holders would prefer marketing investments versus R&D investments.
Debt-holders have the power of imposing this will on managers through a credible threat of forcing liquidation or bankruptcy if cash flows are not satisfactory (Grossman and Hart, 1982). The compound of debt-holders’ risk aversion and the necessity to repay the debt would lead that divestitures with high debt/equity ratios to strategically emphasize marketing over R&D.

**Hypotheses**

In the agency perspective, ownership and capital structures influence the extent to which managers pursue their own interests to the detriment of owners. The implicit assumption is that if these structures can motivate managers to allocate resources in ways that benefit owners, then these mechanisms will generate positive consequences for owners. Thus, managers’ allocation of resources is the route whereby structural characteristics influence firm performance. Even though this assumption is at the core of the agency theory, agency research too frequently went directly to outcomes, skipping the link between structural characteristics and managerial behavior.

To highlight this central assumption, we suggest that divestitures that differ in terms of ownership and capital structures (i.e., spinoffs vs. buyouts) would have different performance via strategic emphasis. We identify two routes through which strategic emphasis conveys the effect of the divestiture type on performance. First, strategic emphasis directly influences the performance that the firm can attain (Mizik and Jacobson, 2003). Thus, “divestiture type – strategic emphasis – performance” is the first chain of effects through which the type of divestiture (spinoff or buyout) influences performance (path a1– b1 in Figure 1). Second, patterns of investments in R&D versus marketing directly influence the level of radicalness of the products that a divestiture can offer (Christensen and Bower, 1996), which in turn influences performance (Sorescu, Chandy, and Prabhu, 2003). Thus, “divestiture type – strategic emphasis – radicalness – performance” is the second chain
of effects through which the fact that a unit is divested as a buyout or a spinoff influences performance (path a1 – c1–c2 in Figure 1).

Consistent with this framework and with the dynamic view of this study, we now hypothesize about the dynamic effects of buyouts vs. spinoffs on a) strategic emphasis (path a1); b) performance via strategic emphasis (paths a1-b1); c) radicalness via strategic emphasis (paths a1-c1); and d) performance via strategic emphasis and radicalness (paths a1-c1-c2).

The dynamic effect of spinoffs vs. buyouts on strategic emphasis.
Spinoffs are characterized by the separation between managers and owners and relatively low debt/equity ratio. Our previous discussion indicates that such ownership and capital structures influence strategic emphasis in opposite directions: ownership structure pushes toward marketing investments while capital structure pulls toward R&D investments. However, it is important to note that spinoffs’ capital and ownership structures tend to remain stable throughout their lives (we find support for this assumption in our database). Thus, we expect the spinoffs’ strategic emphasis to remain stable over time.

Buyouts are characterized by no separation between managers and owners. This ownership structure would lead buyouts to favor R&D versus marketing investments throughout their life. On the other hand, the capital structure changes over time: initially high debt/equity ratios tend to decrease as buyouts repay the debt. Thus, in the early stage of their lives, buyouts’ capital structure and ownership structure would have opposite effects: high debt/equity ratio would push buyouts toward marketing investments; the ownership structure would pull them toward R&D investments. However, the push toward marketing investments fades away over time as the debt/equity ratio decreases. Thus, we expect that over time buyouts’ investments lean toward R&D over marketing (i.e., strategic emphasis increases).
In the light of this discussion, as time passes buyouts’ strategic emphasis increases more than spinoffs’ strategic emphasis. In fact, once the debt is paid down, capital structure remains the main difference between spinoffs and buyouts. We discussed above that spinoffs’ capital structure diminishes strategic emphasis (i.e., it moves toward marketing investments), whereas buyouts’ capital structure increases strategic emphasis (i.e., it moves toward R&D investments). Thus:

H1: Over time buyouts’ strategic emphasis increases more than spinoffs’ strategic emphasis.

The dynamic effect spinoffs of vs. buyouts on performance via strategic emphasis.
The amount of resources that a firm invests in R&D over marketing directly influences the value that a divestiture can appropriate in the marketplace (Mizik and Jacobson, 2003). Marketing investments lead to value creation and hence positive performance by creating an isolating mechanism in the form of brand equity that protects divestiture’s performance from competitors (Kor and Mahoney, 2005). On the other hand, R&D investments influence performance only indirectly through the introduction of new products (Katila and Ahuja, 2002). Thus, the literature indicates that strategic emphasis has a direct, negative effect on performance because firms reduce their investments in marketing (which give immediate payoffs) to increase their investments in R&D (which instead payoff only in the long-run when new products are launched into the market) (i.e., path b1 in Figure 1 is negative). Since we expect that over time buyouts will strategically emphasize R&D investments over marketing investments more than spinoffs (H1), we also expect the direct effect of strategic emphasis on performance to be, over time, more negative for buyouts than for spinoffs. Thus, we hypothesize that:

H2: Over time the mediated effect of divestiture type on performance via strategic emphasis (i.e., path a1-b1 in Figure 1) is more positive for spinoffs than for buyouts.

The dynamic effect of spinoffs vs. buyouts on radicalness via strategic emphasis

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A radical new product incorporates a substantially different core technology and provides substantially higher customer benefits relative to previous products (Chandy and Tellis, 1998). While both R&D and marketing investments are relevant for developing new products, the literature has shown that they have differential effects on radicalness. High R&D investments help a divestiture accumulate technological knowledge and increase its ability to develop and use new technologies (Cohen and Levinthal, 1990). As a result, the divestiture can quickly identify new technologies, experiment with emerging designs, and commercialize innovations beyond its technological boundaries (Zhou and Wu, 2010). Thus, R&D investments positively contribute to radicalness.

Marketing investments help establish strong relationships with customers, who are a valuable source of knowledge to identify new trends in the market (Im and Workman, 2004). However, these same relationships create resource dependence for the firm (Christensen and Bower, 1996; Danneels, 2002). Customers initially refuse to switch to the new technology and force the firm to invest in improvements in the conventional technology. Prior research has shown that new ventures are heavily dependent on their dominant customers (Yli-Renko and Janakiraman, 2008). Thus, while marketing investments provide valuable insights into market needs, these insights would lead divestitures towards incremental innovations.

Taken together, we contend that radicalness increases as a divestiture’s strategic emphasis focuses on R&D more than marketing. Since we expect that over time buyouts will strategically emphasize R&D investments over marketing investments more than spinoffs (H1), we also expect that over time buyouts will commercialize more radical products than spinoffs. Formally,

H3: Over time the mediated effect of divestiture type on radicalness via strategic emphasis (i.e., path a1-c1 in Figure 1) is more positive for buyouts than for spinoffs
The dynamic effect of spinoffs vs. buyouts on performance via strategic emphasis and radicalness. We now turn to discuss how radicalness influences performance, in order to understand the chain of effect “divestiture type – strategic emphasis – radicalness – performance”. This is the second route through which the divestiture type (spinoffs vs. buyouts) influences performance over time. There is large consensus in the literature that radicalness leads to enhanced consumer preferences, accelerated consumer adoption rates, and superior performance (Kleinschmidt and Cooper 1991; Sorescu et al. 2003). We already discussed that over time buyouts increase their strategic emphasis more than spinoffs (H1) and that, because of this, over time buyouts develop more radical products than spinoffs (H3). The compound of previous discussion and the acknowledgment that radicalness positively influences performance leads us to hypothesize that over time buyouts have higher performance than spinoffs because their higher strategic emphasis turns into more radical products, and thus better performance. Formally,

H4: Over time the two-step mediated effect of divestiture type on performance via strategic emphasis and radicalness (i.e., path a1-c1-c2 in Figure 1) is more positive for buyouts than for spinoffs

Please note that H2 and H4 lead to opposite predictions: H2 contends that spinoffs have higher performance than buyouts; H4 predicts the opposite. Such rival predictions are due to the fact that the paths through which divestiture type influences performance are different in the two hypotheses. H2 maintains a direct path from strategic emphasis to performance, in which divestitures that emphasize marketing over R&D (i.e., spinoffs) are at an advantage because marketing directly boosts performance more than R&D. H4 maintains an indirect path of strategic emphasis on performance via radicalness, in which divestitures that emphasize R&D over marketing (i.e., buyouts) are at an advantage because they develop more radical products that in turn boost performance. The total effect of the divestiture type on performance is determined by the sum of these two paths. We let the
empirical analysis determine which path is stronger to indicate what divestiture type has the strongest effect on performance.

**METHOD**

This section describes the sample, measures, and analysis employed in this study.

**Sample**

We collect data on innovation-related buyouts and spinoffs that occurred in the US between 1996 and 2004 from SDC Platinum. Beyond identifying a list of spinoffs and buyouts, this database provides a description of the reasons why the deal was undertaken (e.g., restructuring, merger, entry in new market), a synopsis of the deal history, information about the buyers and the other investors, and the typology of divestiture. We use this information to be sure that the divestures identified in the SDC Platinum database is consistent with our definition of spinoffs and buyouts. Next, we identify those divestitures undertaken for innovation-related reasons. To do that, we look for divestiture announcements in Factiva and PR Newswire. Where available, we also check companies’ websites to cross validate this information. One of the authors read divestiture announcements for 50 companies to gain a sense of the language used to explain reasons for the divestiture. Then, we created a dictionary with the terms used to indicate innovation-related reasons (refer to Appendix 1). We used this dictionary to determine the inclusion or exclusion of the divestiture in the sample. One of the authors and one research assistant read 400 announcements each and distinguished between innovation-related and non-innovation-related divestitures. They shared the same set of 150 announcements. Inter-rater agreement was 95%. Remaining discrepancies were resolved through discussion before reaching consensus. We clarify that in some cases there is more than one reason behind the divestiture. We exclude those buyouts and spinoffs in which the announcement does not report any reference to any innovation opportunity for the divested unit. As such units divested for the
sole reason of obtaining tax reasons are not included in the sample. Also, we have to exclude those
divestitures for which data on our key variables are not available. The difficulty of collecting
secondary data on post-event performance for divested units is known in the literature (Fox and
Marcus, 1992; Phan and Hill, 1995). Our final sample consists of 126 spinoffs and 102 buyouts, for
which we collect data on the first five years of divestitures, for a total of 1,023 observations.

Measures

We collect data for all measures for the first through fifth year after the divestiture.

Performance

We use profits to measure performance. We measure profits as return on asset (ROA)\(^1\). We collect
data on profits from the Wharton Research Data Service. When not available, we supplement this
source with the Edgar SEC database, which provides copies of the firm’s Annual Reports. In a few
cases, we retrieve data directly from the Annual Reports available on the companies’ websites.

Radicalness

We construct our measure in two steps. First, we identify the products that each divested unit
introduced each year, until five years after the divestiture, through the divestiture’s announcements of
new product introductions. We collect announcements through Capital IQ, Mintel Oxygen,
ProductScan, and the company’s press release available on the corporate websites. Then, an MBA
research assistant and one author independently coded the announcements. Given the high number of
announcements, they shared 30% of the announcements. Their inter-rater agreement is 86%. The
coding used the two scales presented in Appendix 2 to rate on 1 to 10 point scale the radicalness of
each new product. We use two scales because our definition of radicalness involves two dimensions:
whether a new product (1) incorporates a substantially different core technology and (2) provides
substantially higher customer benefits relative to the previous product generation in the category

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\(^1\) We also use return on equity (ROE) as a measure of profits. The results, available from authors, remained invariant.
(Banbury and Mitchell, 1995; Chandy and Tellis, 2000). We adapt the definition of radical technological innovations in Sood and Tellis (2005) to measure the first dimension. We develop a scale based on Chandy and Tellis (2000) for the second dimension. We multiply the score of the two scales to get a measure of radicalness. The multiplicative approach allows us to attribute equal weight to each dimension. The radicalness of a divestiture at time \( t \) is calculated as the mean of the radicalness of all the products that it introduced during the time period.

**Strategic emphasis**

Strategic emphasis has been measured as the difference between R&D and marketing expenditures divided by the firm’s assets (Mizik and Jacobson, 2003). However, the industry in which a firm competes may drive the amount of money that a firm invests in R&D and marketing. In order to capture the extent to which a firm is over (under)-investing in R&D or marketing with regard to the average level of investments in its industry, we subtract the average expenditures in R&D (marketing) in the industry in which a firm competes from the firm’s R&D (marketing) expenditures. In this way, we can. Our measure of divestiture’s strategic emphasis is as follows:

\[
\text{Strategic emphasis}_{fti} = \frac{(\text{R} \& \text{D expenditures}_f - \text{R} \& \text{D expenditures}_i) - (\text{Marketing expenditures}_f - \text{Marketing expenditures}_i)}{(\text{Assets}_f - \text{Assets}_i)}
\]

Where the subscripts \( f, t, \) and \( i \) refer to firm, time and industry respectively. We Data on R&D expenditures, marketing expenditures and assets are collected from the same sources used for strategic emphasis. We use TNS Media to supplement data on marketing expenditures.

**Control variables**

We adopt several control variables. \textit{Size} is measured as the logarithm of the number of employees. \textit{High tech industry} is a dummy variable that takes on value 1 if the divestiture operates in a high-tech industry and 0 otherwise (National Science Foundation 2000). We control for \textit{geographic proximity} measured with a reverse scale as the distance in kilometers between the headquarters of the parent
company and the headquarters of the new company (see Barker and Loughran, 2007). Finally, we control for the effects of vertical relatedness and horizontal relatedness on radicalness. Indeed, previous literature shows that these variables might influence the divested unit’s performance (e.g., Semadeni and Cannella, 2011). We use the input-output (IO) data provided by the Bureau of Economic Analysis in the “Use table”, which contains the commodity flows between each pair of almost 500 private-sector intermediate industries. For each pair of industries – i and j – the Table reports the dollar value of i’s output necessary to produce industry j’s total output. We measure vertical relatedness as the dollar amount of input transfer between industries (Fan and Lang, 2000) and horizontal relatedness as the degree to which industries i and j share their input and output (Fan and Lang, 2000).

**Individual growth curve analysis**

Longitudinal data are implicitly multilevel and nested. Treating them as such enables researchers to examine the existence, nature, and causes of within-divestiture performance changes over time (Deadrick, Bennett, and Russell, 1997). We employ individual growth curve analyses using a SAS Proc Mixed procedure to determine changes over time in a) strategic emphasis; b) radicalness; and c) profits, and to estimate the effects of the divestiture type. Specifically, following Singer and Willett’s (2003) recommendations, we fit two unconditional, multilevel models: an unconditional means model and an unconditional growth model. Then, we used the results to build the foundation for subsequent analyses. To test and understand the nature of our hypothesized effects, we account for an implicit variable in the growth model—namely, time. We suggest that the strategic emphasis (or radicalness or profits) –time relationship, modeled in Level 1 of our analysis, is further affected by the divestiture-level variables (i.e., divestiture type) in Level 2.
Unconditional means model

The first step of a multilevel analysis is to fit an unconditional means model or a model without any predictors (Singer and Willett, 2003). Specifically, the dependent variable is expressed as a linear combination of a grand mean, a series of deviations from the grand mean, and random error. The unconditional means model provides a baseline with which more complex models can be compared (Singer, 1998). It takes the following form:

(1) Level 1: \( Y_{ij} = \beta_{0j} + r_{ij} \),

(1a) Level 2: \( \beta_{0j} = \gamma_{00} + \nu_{0j} \).

In this model, \( Y_{ij} \), the strategic emphasis (or radicalness or profits) of the jth divestiture, is a linear function of a grand mean (\( \gamma_{00} \)), a deviation of the jth divestiture from the grand mean (\( \nu_{0j} \)), and a random error term associated with the performance of the ith year of the jth divestiture (\( r_{ij} \)). The model decomposes the variation of the strategic emphasis (or radicalness or profits) into the variation between divestiture means (\( \tau_{00} \)) and the variation among years from the divestiture (\( \sigma^2 \)) (Singer 1998). We use a maximum likelihood estimation approach.

The covariance parameter estimates for strategic emphasis show that the estimated value of \( \tau_{00} \) is 0.08 (Z = 8.08, \( p < .001 \)) and \( \sigma^2 \) is 0.19 (Z = 38.46, \( p < .001 \)). The estimated intra-class correlation \( \rho \) is calculated as: \( \hat{\rho} = \frac{\tau_{00}}{\tau_{00} + \sigma^2} = \frac{0.08}{0.08 + 0.19} = .30 \). This outcome supports our assertion that there is substantial variance of strategic emphasis at the divestiture level. We find similar results for radicalness, in which the estimated value of \( \tau_{00} \) is 4.94 (Z = 3.17, \( p < .01 \)) and \( \sigma^2 \) is 18.82 (Z = 38.35, \( p < .001 \)). Thus, the estimated intra-class correlation is .21. Given these findings, the ordinary least squares assumption that all observations are statistically independent from one another is likely
violated. Such violation may lead to biased estimates and justifies the use of an individual growth curve model.

*Unconditional linear growth model*

We introduce the time variable (i.e., years) and fit an unconditional linear growth model (Models 1 in Table 2 and 3). Take the example of strategic emphasis. The Level 1 equation estimates the individual divestiture’s trajectory of strategic emphasis growth ($\beta_{1j}$) in addition to the mean ($\beta_{0j}$). The Level 2 equation simultaneously partitions the two estimates into sample averages and error components. The models are as follows:

(2)  
Level 1: $Y_{ij} = \beta_{0j} + \beta_{1j} \text{Year}_{ij} + r_{ij},$

(2a) Level 2: $\beta_{0j} = \gamma_{00} + \nu_{0j},$

(2b) Level 2: $\beta_{1j} = \gamma_{10} + \nu_{1j}.$

The year variable ranges from 1 to 5 and represents the number of years since the divestiture. The intercept of the model reflects the initial status of the dependent variable. The coefficient of Year represents the rate of change in the dependent variable across years.

We account for the fact that growth of the dependent variables may follow a non-linear pattern by adding a quadratic term (Models 2). We find no significant quadratic effect on any of our dependent variables. The examination of the $\Delta \chi^2$ also reveals that adding the quadratic term does not improve the fit of our models. Thus, we use a linear growth model as our base model for subsequent analyses. We also compare different structures for the error variance–covariance matrix. Following Singer (1998), we compare three possible structures: compound symmetry, autoregressive with a lag of 1, and unstructured. We use $-2 \log$-likelihood, Akaike’s, and Bayesian information criterions as the basis for the comparison. The results indicate that the unstructured model has the best fit.
Therefore, we employ an unstructured error matrix for all analyses. (Using either of the other two error structures does not change our findings, confirming their stability and robustness.)

**Conditional linear growth model**

We add the divestiture-level predictors to investigate whether growth in our dependent variables is dependent on whether the divestiture is a buyout or a spinoff (Models 3). The model for strategic emphasis is as follows:

\[
\begin{align*}
(3) \quad \text{Level 1: } Y_{ij} &= \beta_{0j} + \beta_{1j} \text{ Year}_{ij} + r_{ij}, \\
(3a) \quad \text{Level 2: } \beta_{0j} &= \gamma_{00} + \gamma_{01} \text{ Buyout}_{ij} + \nu_{0j}, \\
(3b) \quad \text{Level 2: } \beta_{1j} &= \gamma_{10} + \gamma_{11} \text{ Buyout}_{ij} + \nu_{1j},
\end{align*}
\]

In the Level 2 equations, we include a dummy at the divestiture-level that takes on value 1 if the divestiture is a buyout and value 0 if it is a spinoff. In this model, \(\gamma_{00}\) represents the average intercept in the individual growth model; \(\gamma_{10}\) represents the average slopes of the linear term. The sign and significance of \(\gamma_{11}\) reflect the impact of the divestiture type on the growth trajectory of strategic emphasis. A similar logic applies for radicalness and profits.

**RESULTS**

This section reports some descriptive statistics, the results of the main analysis, counterfactual analysis, and some robustness check.

**Descriptive statistics**

Table 1 provides the descriptive statistics and correlations for our variables. Our theoretical framework relies on the following critical assumptions: 1) buyouts have higher management ownership than spinoffs; 2) buyouts have initially higher debt/equity ratios than spinoffs; 3) the debt/equity ratio of buyouts decreases over time. Data in our sample corroborates these assumptions in that we find that the
average management ownership (measured as the combined percentage of stocks owned by the CEO, vice presidents, and executives in higher offices (Zahra, 1996) for spinoff is .11, while the average management ownership for buyouts is .45. This percentage remains stable in the five years. Also, in the first year, the average debt/equity ratio for buyouts is 2.31, while the average debt/equity ratio for spinoffs is .45. However, by the fifth year, the average debt/equity ratio for buyouts drops down to .56.

The dynamic effects of spinoffs vs. buyouts on strategic emphasis

The results for strategic emphasis are in Table 2. Model 1 reports the unconditional linear growth model. We find that the average divestiture begins with a strategic emphasis of -0.09 and strategic emphasis increases by 0.02 each year. Model 2 is the conditional linear growth model. We find a negative relationship between buyouts and initial strategic emphasis ($\gamma = -0.05; p<.05$), which indicates that in the year of the divestiture buyouts’ ratio of R&D investments to marketing investments is lower than spinoffs’ ratio. The positive interaction effect between buyouts and year ($\gamma = 0.02, p<.05$) indicates that the buyouts’ strategic emphasis increases more than spinoffs' strategic emphasis, in support of H1.

Figure 2 plots the evolution of strategic emphasis for spinoffs and buyouts. While spinoffs’ strategic emphasis tends to remain stable over time (it goes from 0.01 to 0.05), as we expected, buyouts’ investments on R&D over marketing constantly increase over time (it goes from -0.02 to 0.1). Also, spinoffs invest in R&D (as compared to marketing) more than buyouts for the first two years after the divestiture; but the opposite holds true from the third year on. These findings support the contention that buyouts are initially under the debt holders’ pressure to favor R&D over marketing investments, but as buyouts repay their debt, this pressure fades away, leaving owner-managers free to emphasize R&D over marketing.
The dynamic effect of spinoffs vs. buyouts on performance via strategic emphasis

We report the results for profits in Table 3. The unconditional linear growth model (Model 1) indicates that the average divestiture starts with negative profits of 0.07 and every year profits increase by 0.06. In Model 2a, we test for the direct effect of divestiture type on profits. The analysis reveals that buyouts have lower profits than spinoffs at the moment of the divestiture ($\gamma = -0.37$, $p < .05$); but over time buyouts’ profits grow more than spinoff’s profits ($\gamma = 0.12$, $p < .05$).

In Model 2b, we add the effect of strategic emphasis on profits, while controlling for the effect of divestiture type on profits. This step is necessary to establish whether strategic emphasis mediates the divestiture type - profits relationship (Baron and Kenny, 1986). Following Singer (1998), we mean-center strategic emphasis. We find that strategic emphasis has a negative effect on divestitures’ initial profits ($\gamma = -0.62$, $p < .001$), but a positive effect on profits growth rates ($\gamma = 0.32$, $p < .001$). We already showed the existence of a positive link between divestiture type and strategic emphasis. Since the effect of divestiture type on profits is no longer significant, strategic emphasis fully mediates the divestiture type – profits relationship (Baron and Kenny, 1986). We check for the significance of this mediated effect at different levels of Year through a bootstrap analysis (Preacher, Rucker and Hayes, 2007). The analysis reveals that the mediated effect is significant at any value of Year. We plot how this mediated effect evolves over time for buyouts and spinoffs in Figure 4A. The Figure shows that the mediate effect of divestiture type on profits via strategic emphasis becomes more and more negative for buyouts, while it tends to remain stable for spinoffs, in support of H2.

The dynamic effects of spinoffs vs. buyouts on radicalness via strategic emphasis

We report the results for radicalness in Table 2. Model 1 indicates that the average divestiture begins with a radicalness of 16.32, but radicalness does not change over time for the average divestiture ($\gamma = -0.47$, $p > .05$). In Model 2a, we test for the direct effect of buyouts vs. spinoffs on the initial status
and growth rates of radicalness. We find that buyouts’ products initially have lower radicalness than
spinoffs’ products ($\gamma = -4.87$, $p<.05$). However, buyouts yield higher levels of radicalness growth
than spinoffs ($\gamma = 2.15$, $p<.05$). In Model 2b, we investigate the possibility that strategic emphasis
mediates the divestiture type-radicalness relationship. We find that strategic emphasis is correlated
with the initial status of radicalness ($\gamma = 17.57$, $p<.001$), indicating that firms with higher strategic
emphasis initially have higher radicalness. Strategic emphasis also increases the growth rate of
radicalness ($\gamma = 4.80$, $p<.05$). The effect of buyouts vs. spinoffs on radicalness growth rates remains
significant ($\gamma =1.68$, $p<.05$).

We calculate the mediated effect of divestiture type on radicalness via strategic emphasis across
years as $[16.72 + (-0.05 \times \text{Buyout} + 0.02 \times \text{Buyout} \times \text{Year} + 0.01 \times \text{Year}) (17.57 + 4.80 \times \text{Year})]$. A
bootstrap analysis reveals that the mediated effect is significant at any value of Year. Figure 3 plots
how this mediated effect evolves over time for buyouts and spinoffs. Spinoffs have higher radicalness
than buyouts in the first year after the divestiture; after that the opposite holds true. Also, spinoffs’
radicalness remains the same over time, while buyouts’ radicalness increases, in support of H3.

The dynamic effect of spinoffs vs. buyouts on performance via strategic emphasis and radicalness
Model 2c in Table 3 adds the effect of radicalness on profits, after controlling for strategic emphasis
and divestiture type. We find that radicalness has a negative effect on profits’ initial status ($\gamma = -0.01,$
$p<.001$) but has a positive effect on growth rates ($\gamma =0.003$, $p<.001$). We plot how the two-step
mediated effect of divestiture type on profits via strategic emphasis and radicalness evolves over time
for buyouts and spinoffs in Figure 4B. The Figure shows that over time this effect increases more for
buyouts than for spinoffs, supporting H4.
The dynamic total effect spinoffs of vs. buyouts on performance

We calculate the total effect of spinoffs vs. buyouts on profits as the sum of the one-step mediated effect via strategic emphasis (i.e., path \(a_1 \times b_1\) in Figure 1) and the two-step mediated effect via strategic emphasis and radicalness (i.e., path \(a_1 \times c_1 \times c_2\)). For completeness’s sake, we also include the mediated effect via radicalness (path \(d_2 \times c_2\)) and the residual direct effect of divestiture type on profits (path \(d_1\)) (Hayes, Preacher and Myers 2010). These two last effects are not significant. We plot the total effect in Figure 5. Spinoffs have higher profits than buyouts in the first two years after divestiture. We attribute the fact that profits are low in the first two years after divestiture to the fact that it takes time before strategic investments and radical products turn into profits. From the third year on buyouts have much higher profits than spinoffs.

A decomposition of the total effect of divestiture type on profits reveals that the one-step mediated effect “divestiture type- strategic emphasis- profits” explains 46.5% of the total effect of divestiture type on profits in the first year after divestiture. Over time the relevance of this mediated effect decreases; five years after divestiture, it explains just 3.8% of the total effect. Paralleling, the relevance of two-step mediated effect increases over time. This finding is consistent with the notion that strategic emphasis does not immediately turn into radicalness and profits but a certain time lag is necessary before this effect starts being in place. Differently, marketing investments have more immediate payoffs and this explains why the first route is more relevant in the early stages of the divestiture life.

Robustness checks

This section presents the results of several robustness analyses.
Self-selection bias

Selection bias might cause endogeneity in the selection of divesting a unit as a buyout or as a spinoff. Specifically, divested units with some characteristics may potentially display a predilection for choosing spinoffs rather than buyouts and these same characteristics may influence the performance of the divested unit. In other words, some a priori variables that determine the decision to create a spinoff rather than a buyout may drive our results, rather than the type of divestiture by itself. In order to rule out this possibility we perform the Heckman (1979) two-step procedure. Following prior research, we investigate seven possible antecedents of the choice to create a buyout rather than a spinoff: the size of the divested unit (Chemmanur and Fulghieri, 1999); the growth of the divested unit while still inside the parent company (Moschieri and Mair, 2008); the level of the divested unit’s cash flow (Singh 1990); the threat of a hostile takeover (Halpern Kieschnick, and Rotenberg, 1999); the extent to which the divested unit is undervalued (Singh, 1990); the level of vertical and horizontal relatedness between the parent company and the divested unit (Sapienza, Parhankangas, and Autio, 2004). The selection equation takes the form:

\[
Buyout_i = \text{Probit} (\gamma_0 W_{0i} + u_i)
\]

(4)

Where \(Buyout_i = 1\) if the divested unit is a buyout; 0 if the divested unit is a spinoff; \(W_0\) is a set of independent variables as described above, including an intercept; \(\gamma_0\) is a vector of associated coefficients; \(u\) is the error term, initially assumed to independently and identically follow a normal distribution; and the subscript \(i\) represents every instance of a firm choosing between a spinoff or buyout. We use the estimates from the probit to compute the Mills lambda, defined as

\[
\lambda = \frac{\varphi(\cdot)}{\phi(\cdot)}
\]

where \(\varphi(\cdot)\) is the probability density function and \(\phi(\cdot)\) is the cumulative density function and accounts for the selection bias. We enter this selection parameter into our previous Equations to control for selection bias. The selection parameter turned to be insignificant, thus suggesting that
there is no selection bias in our sample. Hence, even though some variables might lead to the parent company’s decision to divest through spinoffs rather than buyouts (or vice versa), these variables do not influence our results.

**Survival bias**

In the original analysis, for the years a divestiture was no longer in operation (either because it went bankrupt or because it was acquired), we treat strategic emphasis, radicalness, and profits as missing values. In order to check for possible survival bias, we perform two robustness analyses. First, we exclude the companies that died before five years from the sample and re-run the analysis only with those companies that remained in business for all the five years. The results do not change if we exclude these companies from the sample. Second, we code strategic emphasis, radicalness, and profits as 0 for the years a company is no longer in the market. The results do not change in this case too. Also, we note that the fact that a company does not survive up to five years does not necessarily mean that it was under-performing: divestitures may have died either because they failed (i.e., they are poor performers) or because they were acquired (i.e., they were good performers). Hence, there is no reason to assume a priori that the survival rate biases our results in a positive or negative way.

**Different performance measure**

Since accounting measures could be manipulated by managers, we re-run the analysis Tobin’s q as our final dependent variable. We were able to find this data for 79 spinoffs (since buyouts are private companies it is not possible to have market-based measures for them). The results, which we do not report here for the sake of brevity, but are available from the authors, remained the same.

**Group centering strategic emphasis by firm**
Since grand mean centering only uses between information (rather than within and between information), we re-run the analysis by group-centering strategic emphasis by firm. The results, which we do not report here for the sake of brevity, but are available from the authors, did not change.

**Counterfactual analysis**

We run a counterfactual analysis to evaluate the effect of divesting through a buyout instead of through a spinoff. Assume that:

- 0 is a subscript for spinoff (non-treatment group)
- 1 is a subscript for buyout (treatment group)
- \( Y_{0it} \) the profits of the divested unit \( i \) if it is a spinoff at time \( t \);
- \( Y_{1it} \) the profits of the divested unit \( i \) if it is a buyout at time \( t \);
- \( D_i \in \{0,1\} \) the indicator of the actual divestiture strategy adopted by firm \( i \);

Divestitures have profits in the state in which they are observed and potential profits in the state in which they are not observed. Hence, there are four potential profits outcomes:

- \( E(Y_u|D = 1) \) – the average profits of buyouts that divested as buyouts (we observe this);
- \( E(Y_o|D = 0) \) – the average profits of spinoffs that divested as spinoffs (we observe this);
- \( E(Y_u|D = 1) \) – the average profits buyouts would have obtained had they been divested through spinoffs (we cannot observe this);
- \( E(Y_o|D = 0) \) – the average profits spinoffs would have obtained had they been divested through buyouts (we cannot observe this);

We want to know the profits differential that a divested unit would have obtained if it had been divested as a buyout rather than as a spinoff. This profits differential can be defined as:

\[
E(Y_u - Y_o|D = 1) = E(Y_u|D = 1) - E(Y_o|D = 1)
\]
For which we need to construct the counterfactual profits of a buyout if it were divested as a spinoff \( E(Y_{0t} | D = 1) \). We could use \( E(Y_{0t} | D = 0) \) the observed profits of spinoffs – to estimate this counterfactual; the problem then becomes whether it is possible to use the observed \( E(Y_{0t} | D = 0) \) to represent the unobserved \( E(Y_{0t} | D = 1) \). Now assume that all the relevant differences between spinoffs and buyouts are captured by the observables \( X \), such that \( Y_o \xrightarrow{D} X \). Then we can select from the pool of spinoffs a control group in which the distribution of these observed variables is as similar as possible to the distribution in the buyouts group. In order to reduce possible bias in the performance comparison due to the existence of confounding factors, we use propensity score matching to match buyouts and spinoffs that are as similar as possible. Since matching subjects on an \( n \)-dimensional vector of characteristics is typically unfeasible for large \( n \), the propensity score summarizes pre-divestiture characteristics of each subject into a single-index variable that makes the matching feasible (Becker and Ichino, 2002). The propensity score is defined as the conditional probability of being a buyout given pre-divestiture characteristics (Rosenbaum and Robin, 1983):

\[
p(X) = \Pr(D = 1 | X) = E(D | X)
\]

After matching buyouts with spinoffs, it is possible to calculate \( E(Y_{1t} - Y_{0t} | D = 1) \) – the counterfactual profits differential that a buyout obtained, on average, for having been divested as a buyout rather than as a spinoff.

We run a probit regression as the one in Equation (4) and used the predicted probability of being a buyout as the propensity score to create a counterfactual group. We used the stratification method to match buyouts and spinoffs on the propensity score. For each year, we then calculated \( E(Y_{1t} - Y_{0t} | D = 1) \) up to five years after divestiture. We present the results in Table 4a.
The results indicate that there is no significant difference in profits of buyouts’ and spinoffs’ profits in the first two years. However, from the third year on, buyouts have higher profits than what they would have had if they had been divested as spinoffs. The counterfactual analysis reveals that cumulatively over five years, units that are divested as buyouts rather than spinoffs generate higher profits for 139% for the fact that they had been divested as a buyout rather than as a spinoff.

We run the same analysis taking the point of view of spinoffs. This second counterfactual analysis answers the question: What would be the performance gain (loss) of spinoffs if they had been divested as buyouts? We find that cumulatively over a five-year period, spinoffs generate 170% lower profits than what they would have done if they had been divested as buyouts (Table 4b).

**DISCUSSION**

In tough economic times, firms strive to maintain their focus on core competencies, with the risk of missing promising innovation opportunities that might arise out of their principal business. Alternatively, they might be reluctant to pursue the risk embedded in any innovation project. Divesting units might represent a viable alternative that has become very popular in the last few years (Chesbrough and Garman, 2009). However, despite its popularity, only anecdotal evidence is available about the relative merits of different divestiture types. The present study delves into the reasons behind the performance evolution of two of the most popular types of divestitures: spinoffs and buyouts. The analysis yields the following main results. First, spinoffs and buyouts have similar profits in the first two years after divestiture; afterwards buyouts have much higher profits than spinoffs. Second, divestiture type influences performance through two routes: a one-step mediated effect via strategic emphasis; and a two-step mediated effect via strategic emphasis and radicalness. The two routes have opposite effects on performance. Third, strategic emphasis is the central, causal mechanism that generates heterogeneity in the evolution of spinoffs’ and buyouts’ performance.
This study makes three relevant contributions to the theory and practice.

**How spinoffs and buyouts performance evolve over time**

This study identifies the preferable divestiture type between buyouts and spinoffs. In so doing, we answer a central question in the divestiture literature, which pertains to what divestiture type maximizes performance (Moschieri and Mair, 2008). The analysis indicates that profits do not differ between spinoffs and buyouts in the first two years after divestiture. However, from the third year on, buyouts seem to outperform spinoffs in terms of profits. This finding has clear implications for two subjects: managers of the divesting unit and parent companies.

Managers of the divesting unit face the dilemma of whether they should buy the unit or whether they should let the parent sell it. Our study shows that managers are better off when they buy at least part of the unit. Specifically, the counterfactual analysis reveals that a unit divested as a buyout and not as a spinoff, generates 139% higher profits in a five-year period. This implication is important because several prior studies showed that many managers of the divested unit perceive a buyout as too risky and prefer to move to another company (Wright et al. 1996).

Parent companies usually maintain a stake in the divested unit: on average 9.8% in spinoffs and 3.1% in buyouts in our sample. This study suggests that parent companies should consider increasing their stake in buyouts as these divestitures are better able to generate performance in the long-run than spinoffs. Also, buyouts are better able than spinoffs to generate radical innovations. Thus, firms who divest units involved in innovative projects, but still want to benefit from knowledge spillovers through external venturing (Wadhwa and Kotha, 2006), should prefer buyouts over spinoffs.
Why spinoffs and buyouts performance diverge over time

This study sheds light on the causal mechanism behind performance divergence over time between spinoffs and buyouts. In doing so, we contribute to the divestiture literature that has questioned why spinoffs cannot live up to the expectations of enthusiastic, initial investor responses (Semadeni and Cannella, 2011) or whether buyouts can provide long-term advantages (e.g., Long and Ravenscraft, 1993). Specifically, we find that spinoffs and buyouts differ dramatically in terms of strategic emphasis between R&D and marketing. Under debt-holders’ pressure to maximize immediate returns, buyouts start their life with a strict emphasis on marketing investments at the expense of R&D investments. On the contrary, in the absence of such pressure, spinoffs initially emphasize R&D over marketing more than buyouts. The critical difference between the two divestiture types emerges from the third year on. While spinoffs’ strategic emphasis remains stable, as they repay the debt buyouts gradually emphasize R&D over marketing increasingly over the years.

Further, we identify two main routes through which strategic emphasis influences divestitures’ performance. On the one hand, strategic emphasis has a direct, negative effect on profits that accumulates over time. Reduced investments in marketing reduce the divestiture’s capability to build isolating mechanisms that protect its market space from competitors (Kor and Mahoney, 2005). Thus, divestitures that invest more in R&D than in marketing are at disadvantage through this route (Figure 4A). This disadvantage grows greater as years pass. On the other hand, strategic emphasis positively contributes to radicalness and this effect accumulates over time. In other words, R&D investments accumulate over time to create the know-how necessary to develop breakthrough innovations (Dierickx and Cool, 1989). This know-how provides divestitures that emphasize R&D over marketing with an advantage that increases over time as firms with more radical products obtain better profits in the marketplace. The finding that this second route becomes predominant as time passes explains why buyouts enjoy much higher profits than spinoffs from the third year on.
The mediating role of strategic emphasis
Strategic emphasis emerges as a central variable to understand the effect of the choice to divest as a spinoff rather than as a buyout on the divestiture’s performance. This finding contributes to the agency theory in that it clarifies the way through which ownership and capital structures shape performance. While scholars have largely accepted agency theory for decades, recent empirical evidence has failed to provide support for it (e.g., Dalton et al., 2003). This research shows that agency mechanisms do not automatically lead to improved performance. In fact, we find that choices about the divestiture type have no direct effect on performance, but their influence is fully mediated by strategic emphasis. This finding corroborates the view that agency mechanisms influence managers’ resource allocation; it is this decision that in turn influences radicalness and performance. The full mediation effect that we detect clarifies the reasons for the poor support of the agency mechanisms - performance relationship reported in the previous literature. In fact, performance is a distal variable from the choice to divest as a spinoff or as a buyout. Competing causes or random factors may impede the detection of the direct effect of a variable on a distal dependent variable (Shrout and Bolger, 2002). The fact that scholars have analyzed a too distal relationship may explain why they have found weak or no effect of ownership or capital structures on performance.

Limitations and directions for future research
Despite the care taken in analyzing the effect of divestiture types, this work suffers from some limitations that may represent interesting avenues for future research. First, we investigate a very specific divestiture types, namely innovation-related divestitures. However, parent companies can divest units for other reasons, such as tax benefits, preparation for mergers, or reducing waste of resources. Thus, the conclusions of this study must be limited to the case of innovation-related divestitures. Second, we identify a set of key actions that influence the variance in a divestiture’s performance. However, we recognize that other factors in the nature of buyouts or spinoffs itself
might well influence the performance results that we observed. These factors warrant future investigation. For instance, Wright et al. (2000) argue that the cognitive orientation (management versus entrepreneurial) might explain the performance of buyouts. It might be interesting to assess whether buyouts enjoy an advantage over spinoffs because buyouts’ managers are more entrepreneurial orientated than spinoffs’ managers. Third, we were unable to ascertain the effects on stock prices. It would be interesting to see if markets are efficient and discount the value of spinoffs because of their poorer long term performance.
REFERENCES


FIGURE 1. Theoretical Model

Strategic emphasis (R&D vs. marketing investments)

Divestiture type (spinoffs vs. buyouts)

Profits

Radicalness

Paths not hypothesized but tested in the empirical model
FIGURE 2

Strategic Emphasis (R&D over Marketing Investments) for Buyouts vs. Spinoffs

Negative values indicate that the divestiture invests more in marketing than in R&D.

---

2 Negative values indicate that the divestiture invests more in marketing than in R&D.
FIGURE 3. Mediated Effect of Buyouts vs. Spinoffs on Radicalness via Strategic Emphasis
FIGURE 4. Mediated Effects of Divestiture Type on Profits

(A) Mediated effect via strategic emphasis

(B) Two-step mediated effect via strategic emphasis and radicalness
FIGURE 5. Total Effect of Divestiture Type on Profits
### TABLE 1. Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>St. dev.</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
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</thead>
<tbody>
<tr>
<td>1. Profits</td>
<td>0.27</td>
<td>1.12</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Radicalness</td>
<td>14.93</td>
<td>19.77</td>
<td>.13*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Strategic emphasis</td>
<td>0.10</td>
<td>0.20</td>
<td>.04</td>
<td>-.07*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Buyouts</td>
<td>.41</td>
<td>.49</td>
<td>.01</td>
<td>.02</td>
<td>-.04</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Size (log employees)</td>
<td>6.58</td>
<td>1.84</td>
<td>.02</td>
<td>-.01*</td>
<td>.04</td>
<td>-.10*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. High-tech industry</td>
<td>.61</td>
<td>.50</td>
<td>-.03</td>
<td>.01</td>
<td>.08*</td>
<td>-.17*</td>
<td>-.04</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Vertical relatedness</td>
<td>.01</td>
<td>.03</td>
<td>-.02</td>
<td>-.01</td>
<td>.03</td>
<td>.06*</td>
<td>.07</td>
<td>.03</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8. Horizontal relatedness</td>
<td>.53</td>
<td>.45</td>
<td>-.02</td>
<td>.05</td>
<td>-.02</td>
<td>-.04</td>
<td>.11*</td>
<td>-.12*</td>
<td>-.08*</td>
<td>1</td>
</tr>
<tr>
<td>9. Geographic proximity</td>
<td>321.79</td>
<td>728.27</td>
<td>.01</td>
<td>-.01</td>
<td>.03</td>
<td>-.09*</td>
<td>.01</td>
<td>-.05</td>
<td>-.03</td>
<td>.03</td>
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</table>

* p<.05
TABLE 2. Results of the Individual Growth Models Analysis for Strategic Emphasis and Radicalness

<table>
<thead>
<tr>
<th></th>
<th>DV: Strategic Emphasis</th>
<th></th>
<th>DV: Radicalness</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 1</td>
<td>Model 2a</td>
<td>Model 2b</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.09 (0.03)***</td>
<td>-0.05 (0.03)</td>
<td>16.32 (1.62)***</td>
<td>18.25 (2.06)***</td>
<td>16.72 (1.97)***</td>
</tr>
<tr>
<td>Initial status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>.02 (.004)***</td>
<td>0.01 (0.006)*</td>
<td>-0.47 (0.28)</td>
<td>-1.34 (0.56)</td>
<td>-1.23 (.55)*</td>
</tr>
<tr>
<td>Buyouts</td>
<td></td>
<td>-0.05 (0.02)*</td>
<td></td>
<td>-4.87 (2.83)*</td>
<td>-3.49 (2.74)</td>
</tr>
<tr>
<td>Strategic Emphasis</td>
<td></td>
<td></td>
<td></td>
<td>17.55 (5.68)***</td>
<td></td>
</tr>
<tr>
<td>Growth rates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buyout X Year</td>
<td>0.02 (0.01)*</td>
<td></td>
<td>2.15 (0.87)*</td>
<td>1.69 (0.86)*</td>
<td></td>
</tr>
<tr>
<td>Strategic Emphasis X Year</td>
<td></td>
<td></td>
<td>4.81 (1.92)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.003 (0.004)</td>
<td>0.003 (0.004)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-tech</td>
<td>0.03 (0.2)†</td>
<td>0.03 (0.02)†</td>
<td>0.16 (1.47)</td>
<td>0.31 (1.49)</td>
<td>1.39 (1.37)</td>
</tr>
<tr>
<td>-2 log-likelihood</td>
<td>171.13</td>
<td>166.32</td>
<td>4394.32</td>
<td>4388.92</td>
<td>4299.40</td>
</tr>
<tr>
<td>Incremental $\chi^2$ ($\Delta$df)</td>
<td>4.81 (2)†</td>
<td></td>
<td>5.40 (2)†</td>
<td></td>
<td>89.52 (2)***</td>
</tr>
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</table>

*p<.1; **p<.05; ***p<.01; ****p<.001. Unstandardized coefficients are reported.
TABLE 3. Results of the Individual Growth Models Analysis for Profits

<table>
<thead>
<tr>
<th></th>
<th>Profits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.07 (.12)</td>
</tr>
<tr>
<td>Initial status</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>.07 (.03)**</td>
</tr>
<tr>
<td>Buyouts</td>
<td>-0.33 (.18)*</td>
</tr>
<tr>
<td>Strategic Emphasis</td>
<td></td>
</tr>
<tr>
<td>Radicalness</td>
<td></td>
</tr>
<tr>
<td>Growth rates</td>
<td></td>
</tr>
<tr>
<td>Buyout X Year</td>
<td>.12 (0.06)*</td>
</tr>
<tr>
<td>Strategic Emphasis X Year</td>
<td>.</td>
</tr>
<tr>
<td>Radicalness X Year</td>
<td>.</td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
</tr>
<tr>
<td>High-tech</td>
<td>-0.06 (.09)</td>
</tr>
<tr>
<td>Vertical relatedness</td>
<td>-0.29 (1.56)</td>
</tr>
<tr>
<td>Horizontal relatedness</td>
<td>-0.086 (0.10)</td>
</tr>
<tr>
<td>Geographic proximity</td>
<td>-0.001 (0.001)</td>
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<tr>
<td>-2 log-likelihood</td>
<td>1253.39</td>
</tr>
<tr>
<td>Incremental $\chi^2$ ($\Delta$df)</td>
<td>4.91 (2)†</td>
</tr>
</tbody>
</table>

*p<.1; **p<.05, ***p<.01; †p<.001. Unstandardized coefficients are reported.
TABLE 4a. Counterfactual profits differential that a buyout obtains for having been divested as a buyout rather than as a spinoff

<table>
<thead>
<tr>
<th>Profits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>-2.03%</td>
</tr>
<tr>
<td>Year 2</td>
<td>16.97%</td>
</tr>
<tr>
<td>Year 3</td>
<td>25.39% *</td>
</tr>
<tr>
<td>Year 4</td>
<td>38.92% **</td>
</tr>
<tr>
<td>Year 5</td>
<td>56.88% **</td>
</tr>
<tr>
<td>Cumulative</td>
<td>139.17%</td>
</tr>
</tbody>
</table>

TABLE 4b. Counterfactual profits differential that a spinoff obtains for having been divested as a spinoff rather than as a buyout

<table>
<thead>
<tr>
<th>Profits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>14.40% *</td>
</tr>
<tr>
<td>Year 2</td>
<td>-53.27% *</td>
</tr>
<tr>
<td>Year 3</td>
<td>-67.46% *</td>
</tr>
<tr>
<td>Year 4</td>
<td>-25.41%</td>
</tr>
<tr>
<td>Year 5</td>
<td>-38.11% *</td>
</tr>
<tr>
<td>Cumulative</td>
<td>-169.86%</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01
APPENDIX 1- Dictionary of terms used to indicate innovation-related reasons

- Conduct research and development of potential new… products
- Accelerate the unit’s R&D efforts
- Support critical research to develop new products
- Obtain funds necessary for future products/ product development
- Increase research in ... products/ markets/ areas
- Catch opportunities in the … market by introducing new products/ product innovation
- Increase new product introductions in the … business/market
- Pursue new product opportunities in the … market/area
- Enter the … market/area/ business through new products
- Seize new product opportunities in the … market/area
- Pursue growth through new products in the … market
- Enter the … market/area/ business through product innovation
- Develop new products in the area of …
- Explore new product opportunities in the … business
- Tap independently new product opportunities in the … business/ market
- Explore emerging new product trends in the… business/ market
Appendix 2: Scales Used to Measure the Two Dimensions of Radicalness

A. MINOR OR MAJOR CHANGE IN THE CORE TECHNOLOGY
Scale - The innovation is graded on a scale from 1-10 and anchored by 1 for minor change and 10 for major change.

Minor change
*Definition:* Innovation that offers minor improvements relative to existing technologies.

Major change
*Definition:* Innovation that uses a new technology based on scientific principles that are distinctly different from those of existing technologies (Sood and Tellis, 2005)

*Example:*  
1 - Floppy disks decreased from 14 to 8 inches in 1978, to 5.25 inches in 1980, to 3.5 inches in 1985, and to 2.5 inches in 1989, though each was based on magnetic recording  
5 - Magnetic tape, floppy disk, and zip disk differ by use of components or materials, though all are based on the platform of magnetic recording  
10 - The compact disk (CD) used a new technology, laser optics, to write and read data when the prior technology used magnetism

B. MINOR OR MAJOR BENEFITS TO CUSTOMERS
Scale - The innovation is graded on a scale from 1-10 and anchored by 1 for minor benefit to customers and 10 for major benefit to customers.

Minor benefit
*Definition:* Innovation that offers minor improvements in benefits to consumers relative to existing products, services, or processes.

Major benefit
*Definition:* Innovation that offers substantially higher customer or user benefits relative to existing products, services, or processes.

*Example:*  
1 - Toyota offering a different color for one of its car models  
5 - Toyota redesigning one of its car models for extra storage space in the trunk  
10 - Toyota offering hybrid cars