

CEO Assessment and the Structure of Newly Formed Boards*

DAVID J. DENIS
University of Pittsburgh
Joseph M. Katz Graduate School of Business

DIANE K. DENIS**
University of Pittsburgh
Joseph M. Katz Graduate School of Business

MARK D. WALKER
North Carolina State University
Poole College of Management

September, 2015

* We thank an anonymous referee, Fred Bereskin, Naveen Daniel, Nishant Dass, Eli Fich, Kwang Lee, Ron Masulis, David Reeb, Shawn Thomas, Melissa Toffanin, Mike Weisbach, and seminar participants at Bentley University, Carnegie Mellon University, Duquesne University, Georgia Tech, North Carolina State University, Penn State University, the Securities Exchange Commission, the University of Pittsburgh, and Virginia Tech for helpful comments on earlier versions. The paper has also benefited from comments from participants at the 'New Ideas' session at Drexel University's 2012 Corporate Governance Conference, the 2012 Northern Finance Association meeting, the John L. Weinberg Center 2012 Corporate Governance Symposium, the 2013 China International Conference in Finance, and the 2014 Columbia University Corporate Governance Conference.

** Corresponding author. Mervis Hall, Katz Graduate School of Business, University of Pittsburgh, Pittsburgh, PA 15260; diane@katz.pitt.edu; 412-251-0659.

CEO Assessment and the Structure of Newly Formed Boards

Abstract

Following corporate spinoffs, unit boards are formed from scratch. We find that these ‘de novo’ boards are smaller, more independent, include more outside directors with relevant industry expertise, and derive more industry expertise from outsiders than do industry and size-matched peers. These differences are observed only when the unit CEO was not the CEO or a director of the pre-spinoff parent firm – i.e., when there is a greater need to assess the CEO’s ability and match with the firm. We conclude that the need for CEO assessment is an important element of the structure of newly formed boards.

JEL Classification: G34

Keywords: Board of directors, Spinoffs, Governance

The structure of the board of directors has been the topic of considerable debate and academic research over the past two decades.¹ As noted in Schwartz-Ziv and Weisbach (2013), existing theories of board structure generally emphasize either the board's advisory (managerial) role or its monitoring (supervisory) role. Empirical tests of these theories typically analyze the extent to which observed board structures are related to asset and operating characteristics in ways that are consistent with firms' relative needs for advising versus monitoring. Although much of this literature focuses on aggregate measures of board composition, such as board size or the fraction of independent outside directors, recent studies have begun to explore specific director attributes.²

More recently, Hermalin and Weisbach (2014) propose that, in addition to carrying out its advising and monitoring responsibilities, the board of directors must also continually assess the intrinsic ability, competency, and overall match of the CEO to the firm. Though complementary to the monitoring role, CEO assessment is a distinct role for the board. Essentially, assessment is concerned with learning whether the CEO is inherently able to maximize shareholder wealth, whereas monitoring involves ensuring that the CEO actually does so in the face of conflicts of interest with the shareholders. To the extent that firms systematically differ in their needs for CEO assessment, differences in board structure should reflect these differences.

¹ See Adams, Hermalin, and Weisbach (2010) for a recent survey of this literature.

² See, for example, Lehn, Patro, and Zhao (2009), Boone, Field, Karpoff, and Raheja (2007), Coles, Daniel, and Naveen (2008), and Linck, Netter, and Yang (2008) for evidence on board size and the fraction of independent outside directors; Agrawal and Knoeber (2001) and Goldman, Rocholl, and So (2009) for evidence on political directors; Field, Lowry, and Mkrtchyan (2013) for evidence on venture capital directors; Fahlenbrach, Low, and Stulz (2010) for evidence on CEO directors; and Daniel, McConnell, and Naveen (2011) and Masulis, Wang, and Xie (2012) for evidence on multinational directors.

We use the experimental setting of corporate spinoffs to shed further light on the determinants of board structure. In a corporate spinoff, the original parent is separated into two (or more) independent corporations, each with its own traded shares of common stock. The stock of the spun off unit is distributed on a pro rata basis to the shareholders of the original parent, with no cash generated for either the parent or the subsidiary. Importantly, as part of this process, a board of directors must be put in place for the unit.

This process makes an analysis of corporate spinoff transactions particularly well-suited to provide unique insights into the formation of corporate boards. First, because the spun off units are new, publicly-traded, stand-alone firms, they must form their boards of directors from scratch. This ‘de novo’ feature provides an opportunity to observe boards that are less likely to be affected by factors that contribute to the ‘stickiness’ of ongoing boards. This makes spinoffs a useful arena in which to examine the empirical importance of hypothesized determinants of board structure.

Second, spinoffs allow us to consider the impact on board structure of the board’s need to learn about CEO ability. Hermalin and Weisbach (2014) propose that CEO assessment is more important the less is known about the CEO and about the firm’s prospects. It follows, therefore, that: i) CEO assessment is more important for newly independent unit firms than for publicly-traded matched firms or post-spinoff parent firms; and ii) CEO assessment is more important when a new CEO is newly promoted or hired from outside, and when that new CEO was not previously a member of the pre-spinoff board. Because our sample spinoffs exhibit wide variation in the origin of the unit’s CEO, they represent a fruitful area for empirically exploring how the need for CEO assessment affects board structure. Based on the models of Hermalin and Weisbach (1998) and Hermalin (2005), as well as empirical evidence in Faleye, Hoitash, and

Hoitash (2012), Masulis, Ruzzier, Xiao, and Zhao (2012), and Yermack (1996), we hypothesize that the boards of firms that require more CEO assessment will have smaller and more independent boards, with higher proportions of outside directors who have relevant industry expertise.

Third, in addition to creating a new unit firm, the spinoff transaction represents a discrete and significant change in the asset and operating structure of the remaining parent, increasing the likelihood that the benefits of board changes exceed the transactions costs associated with undertaking them. This provides an additional opportunity to re-examine traditional determinants of board structure. In addition, the continuity of the post-spinoff parent firms, together with variation in the source of their CEOs, provide further opportunities to explore the extent to which the need for CEO learning/assessment affects board structure.

Our sample consists of 143 non-taxable spinoffs announced between 1994 and 2010. We find that boards formed from scratch differ significantly from a set of industry and size-matched publicly-traded peers. Specifically, newly formed unit boards are smaller, have relatively more outside directors, have more directors with same-industry experience, and derive more of their same-industry expertise from outside directors than do the matched firm boards. Furthermore, these differences in unit-match board structure are confined to those unit firms whose CEO was not the CEO or a board member of the pre-spinoff parent firm – i.e., those for which we hypothesize a greater need for CEO assessment. Together, these results support the hypothesis that boards of newly independent unit firms with untested CEOs have more to learn about the inherent suitability of their CEOs and that such learning is best accomplished by independent outsiders who have industry knowledge and incentives to avoid free-riding.

By contrast, we find little evidence that our proxies for the need for CEO assessment are significant determinants of the post-spinoff parent board structure. These findings fit with the view that CEO assessment is less important for these continuing firms. Further consistent with this view, we find that among post-spinoff parent firms, characteristics of the firm's asset and operating structure are somewhat more important determinants of board structure than in unit firms.

Overall, our findings indicate that the board's need to assess the inherent suitability of the CEO is an important element of board structure early in the life of a firm and early in the tenure of a CEO. Although such assessment is likely an ongoing process throughout the life of a firm or the tenure of a CEO, our results for parent firms suggest that it becomes relatively less important over time.

Our results complement those of Wruck and Wruck (2002), who use spinoffs to study the link between asset restructuring and restructuring of the top management team. Consistent with our evidence for unit CEOs, Wruck and Wruck find considerable variability in the source of the top two executives in spinoff firms. Their results suggest that governance expertise and prior top management experience are important determinants of who makes up the top management team. We, in turn, find that the nature of that prior experience has important implications for the composition of the newly formed board of directors. Our findings add to an understanding of how governance is structured in firms by documenting the importance of the need to assess the inherent ability, competency, and overall match of the CEO in structuring boards of directors.

1. Background

The functions of the board have traditionally been divided into two broad, overlapping categories: advising management on strategies and actions that maximize shareholder wealth, and monitoring management to ensure that they act in shareholders' interests. A large literature seeks to shed light on how boards are structured to most effectively fulfill these roles by studying the relationship between board structure and firm characteristics.

More recently, Hermalin and Weisbach (2014) propose an additional role for the board of directors that is distinct from either its advising or monitoring roles. They focus on learning models of managerial competence, in which managers' intrinsic ability, competency, and match to their employers must be continually assessed, and suggest that these learning models have important implications for corporate governance, including the board of directors.

We provide an overview of these literatures in section 1.1. In section 1.2 we elaborate on the spinoff process and the ways in which spinoffs provide a unique opportunity to expand our understanding of how board structure is determined.

1.1. Determinants of board structure

1.1.1 Advising and monitoring

The traditional view in the corporate governance literature has been that board monitoring is accomplished most effectively by outside directors dominating a board that is small enough to avoid coordination and free-riding problems.³ More recently, however, Raheja (2005) and Harris and Raviv (2008) develop more nuanced models of board monitoring in which

³ See, for example, Weisbach (1988), Borokhovich, Parrino, and Trapani (1996), Brickley, Coles, and Terry (1994), Byrd and Hickman (1992), and Cotter, Shivdasani, and Zenner (1997) for evidence related to board independence. Yermack (1996) and Eisenberg, Sundgren, and Wells (1998), among others, provide evidence related to board size.

the effective size and composition of boards depends on specific firm and director characteristics. The basic trade-off in these models is between the benefits of the firm-specific information that insiders possess and the reduced monitoring that comes from having fewer outside directors. If the cost of information needed for monitoring is high relative to the extent of agency problems, firms will tend to have more inside directors.

Recognition of the advisory role of boards dates back at least to Fama and Jensen (1983), who argue that inside directors possess firm-specific knowledge that can be helpful in setting operating strategies in uncertain environments. Similarly, Coles Daniel and Naveen (2008) argue that firms with a greater need for firm-specific knowledge (e.g. those with higher R&D) should have a higher proportion of insiders on the board. In addition, Boone, Field, Karpoff, and Raheja (2007) and Coles, Daniel, and Naveen (2008) hypothesize that a firm's advising needs increase with the scope and complexity of its operations. Because more complex firms require more advice and a greater variety of expertise, they are more likely to have larger boards and more outsiders.

Fama and Jensen (1983) point also to the role of the board of directors in controlling the agency problems associated with common stock. Boone, Field, Karpoff, and Raheja (2007) hypothesize that the need for monitoring of managers by the board will have the greatest impact on board structure when the private benefits of control are high or the costs of monitoring are low.

This literature thus predicts that value-maximizing board structures will systematically differ across firms according to the nature of their firm-specific assets and operations. Empirical tests of these predictions typically involve an analysis of the cross-sectional relationship between either the number of directors (board size) or the proportion of outside directors (board

composition) and firm-specific characteristics that serve as proxies for the hypothesized determinants.⁴ Individual findings and the precise conclusions drawn from them with respect to advising vs. monitoring vary somewhat across studies. In general, however, these studies provide evidence that board size and board independence are positively associated with firm size and negatively associated with growth opportunities and research and development expenditures. By and large, these findings are consistent with predictions from models that focus on the costs/benefits of monitoring and the demand for advising.

The above studies tend to focus on fundamental measures of board structure – i.e., board size and the proportion of independent outsiders on the board. However, there are potentially important differences among directors in their experience and expertise. Brickley and Zimmerman (2010) suggest that directors' backgrounds are arguably more important than either the absolute or relative number of outsiders on the board. Recognizing this possibility, several other studies go beyond these traditional measures of board structure in an attempt to shed light on the unique attributes or skills that individual board members bring to the firm. Examples include political directors (Agrawal and Knoeber (2001), Goldman, Rocholl, and So (2009)), venture capital directors (Field, Lowry, and Mkrtchyan (2013)), CEO directors (Fahlenbrach, Low, and Stulz (2010)), supply chain directors (Dass, Kini, Nanda, Onal, and Wang (2013)), multinational directors (Daniel, McConnell, and Naveen (2011) and Masulis, Wang, and Xie (2012)), and directors with relevant industry expertise (Faleye, Hoitash, and Hoitash (2012) and Drobetz, Meyerinck, Oesch, and Schmid (2014)).

⁴ See, for example, Boone, Field, Karpoff, and Raheja (2007), Coles, Daniel and Naveen (2008), Lehn, Patro, and Zhao (2009), and Linck, Netter, and Yang (2008).

1.1.2 *CEO assessment*

In addition to advising and monitoring top management, boards of directors must assess executives' inherent suitability to run their firms. Hermalin and Weisbach (1998) develop a model of CEO assessment in which the board of directors learns about a particular CEO's abilities over time, updating their beliefs along the way. Depending on the nature of the information gained, the board decides to retain or replace the CEO. In their model, an independent board is more likely to seek out and obtain such information about the CEO and, therefore, to remove a CEO when warranted. Over time, a high quality CEO acquires greater bargaining power and can bargain for a less independent board. Hermalin (2005) proposes that the option value of information about a CEO's ability is greater when it must assess a relatively unknown CEO. Such value can only be realized, however, if the board of directors is diligent enough to seek out information. Both models imply that board independence is more important the less is known about a CEO. Consistent with this, Boone, Field, Karpoff, and Raheja (2007) find that the proportion of outsiders on the board is negatively related to CEO tenure.

Hermalin and Weisbach (2014) propose that the ways in which managers' intrinsic ability, competency, and match to their employers are assessed is an important, but understudied, aspect of corporate governance. They suggest that assessment is more important the less is known about a particular manager and about the firm; thus, the importance of CEO assessment diminishes over the CEO's tenure with the firm. Empirical evidence in the literature supports this conjecture.⁵ Pan, Wang, and Weisbach (2015) provide evidence of a positive relationship between uncertainty about CEO quality and stock return volatility; they find that volatility

⁵ See Gibbons and Murphy (1992), Chung, Sensoy, Stern, and Weisbach (2012), Lim, Sensoy, and Weisbach (2013), and Taylor (2013) for evidence based on changes in compensation.

decreases over a CEO's tenure. Their evidence indicates that learning about CEO ability happens particularly quickly when there is a high degree of uncertainty about the CEO and his/her match to the firm.

1.2. Spinoffs and board structure

In a typical spinoff, a publicly-traded parent firm spins off a portion of its operations to become a separate publicly-traded firm, leaving behind a parent firm whose asset and operating structures have been substantially altered. The spinoff is accomplished by distributing shares in the spun off unit – i.e. the new publicly-traded firm – to the existing shareholders of the parent firm. As noted earlier, this process yields several avenues for providing fresh insights into the determinants of board structure.⁶

First, the division of assets and accompanying post-spinoff (re)formation of boards help to mitigate transaction cost impediments to board formation. Because the assets, operations, and management of most individual firms evolve over the life cycle of the company, the value-maximizing board structure should evolve correspondingly. However, Coles, Daniel, and Naveen (2008) argue that numerous transaction and contracting costs impede value-increasing changes in board size or independence. These transactions costs can include the structure of board election processes, the personal costs and firm reputation effects associated with firing directors who have not performed poorly, institutional pressure to conform to one-size-fits-all board recommendations, and the time and expenditure required to identify potential directors. If

⁶ Prior studies provide some evidence on traditional measures of board structure around spinoffs. Ahn and Walker (2007) find that focus-increasing spinoffs are more likely to be undertaken by firms that have smaller boards and whose members have greater equity ownership in the firm. They conclude that the spinoff decision is associated with stronger internal governance. Seward and Walsh (1996) find that the average spun off firm has a majority of outsiders on its board of directors and on the compensation committee. They conclude that spun off firms put in place strong internal control systems.

these transaction costs are large enough, board structure will be somewhat ‘sticky.’ Consistent with this prediction, Denis and Sarin (1999) find no evidence that changes in board structure are related to changes in firm-specific characteristics, while Boone, Field, Karpoff, and Raheja (2007) find that firm and CEO characteristics at the time of an IPO help explain board composition several years after the IPO. One implication of this stickiness is that observing board structures and their determinants at any given point in time can provide an incomplete picture of how and why such structures developed.

Because the spun off units are new, publicly-traded, stand-alone firms, they must form their boards of directors from scratch. This ‘de novo’ feature provides a unique opportunity to observe boards that are less likely to be affected by the factors that contribute to the ‘stickiness’ of ongoing boards. Even newly public firms, such as those studied in Baker and Gompers (2003) and Boone et al. (2007), have pre-existing boards. Similarly, the spinoff produces a discrete and significant change in the nature and size of operations for the remaining parent firm. Arguably, such large operational changes reduce the relative importance of the type of transaction cost impediments to board structure adjustments described in Coles, Daniel, and Naveen (2008).

Second, spinoffs provide us a unique setting in which to examine the extent to which the need to learn about/assess the CEO’s inherent ability, competency, and match to the firm affects board structure. Hermalin and Weisbach (2014) propose that learning and assessment are more valuable the less is known about the individual CEO and the firm’s prospects. We hypothesize that, because they are newly independent firms with newly appointed CEOs, spun off unit firms are in greater need of assessment than are otherwise similar firms or the remaining parent firms. Furthermore, the unit firm CEOs come from several different sources. This creates important variation in how much is likely to be known about their CEOs, which provides further

opportunity to explore the effect of learning and assessment on board structure. We hypothesize that there will be a greater need for CEO assessment in those cases in which the CEO was not previously the parent company CEO or was not previously on the parent board.

The models of Hermalin and Weisbach (1998) and Hermalin (2005) imply that outside directors are more diligent assessors of the CEO's inherent ability, competency, and match to the firm. Faleye, Hoitash, and Hoitash (2012) and Masulis, Ruzzier, Xiao and Zhao (2012) provide evidence that the proportion of outside directors with relevant industry expertise is associated with greater sensitivity of turnover to performance, consistent with higher skill and/or greater diligence in assessing their CEOs and acting on their assessments. Similarly, Yermack (1996) provides evidence that smaller boards are associated with higher likelihoods of CEO turnover. Based on these findings, we hypothesize that the boards of firms that require more CEO assessment will have smaller and more independent boards, with higher proportions of outside directors who have relevant industry expertise.

Third, in addition to creating a new unit firm, the spinoff transaction represents a discrete and significant change in the asset and operating structure of the remaining parent, increasing the likelihood that the benefits of board changes exceed the transactions costs associated with undertaking them. Thus, an analysis of post-spinoff parent boards provides further evidence on the learning/assessment hypothesis. As noted in Hermalin and Weisbach (2014), the importance of learning and assessment is greater when there is more uncertainty about both the CEO's ability *and* the firm's prospects. For the de novo unit, both of these are uncertain for those cases for which the unit hires an outsider as CEO or for which the unit CEO is an insider with no CEO experience. For the parent firm, there might be similar uncertainty about the CEO's ability for

new hires, but there is less uncertainty about the firm's prospects. Thus, we expect learning and assessment to be less important for the board structures of post-spinoff parents.

2. Sample Selection and Description

Our sample selection process initially identifies all spinoffs from the Security Data Corporation's (SDC) Mergers and Acquisitions Database between 1994 and 2010. We limit the sample to tax-free spinoffs in order to ensure that the spun off unit is truly an independent firm.⁷ We obtain financial data from Compustat and board composition data from corporate proxy statements. In order to be included in the final sample, we require that each spinoff has Compustat data and a proxy statement available for the parent before and after the spinoff, and for the spun off unit. We have complete data for 143 spinoffs.⁸ Table 1 reports a time profile of the sample spinoffs. The annual number of spinoffs ranges from a low of two in 2006 to a high of 18 in 2000.

In Table 2, we report mean and median values for several asset and operating structure characteristics that have been linked with board structure in prior studies. These include the ratio of market value-to-book value, R&D-to-total assets, capital expenditures-to-total assets, operating income-to-total assets, free cash flow-to-total assets, long-term debt-to-total assets, total assets, property, plant, and equipment-to-total assets, and the Herfindahl index for the firm's primary 4-digit SIC industry. We report these characteristics for the parent before the spinoff, the parent after the spinoff, and the spun off unit. All statistics for the pre-spinoff parent

⁷ Under Section 355 of the Internal Revenue Code, a stock distribution is considered non-taxable if it represents at least 80% of the shares of the spun off unit, is done for a valid business purpose, and both parent and unit have been in business for at least five years before the distribution date.

⁸ Thirteen of our spinoffs are from six transactions. In five of these cases, two unit firms were created in addition to the parent. In one case, three unit firms were created in addition to the parent. As a robustness check, we re-run the relevant tests after eliminating these thirteen transactions. Our results are qualitatively unaffected.

are for the fiscal year ending just prior to the spinoff, while the statistics for the post-spinoff parent and the spun off unit are for the first fiscal year subsequent to the spinoff. We compare each individual characteristic for each post-spinoff firm to that of the parent firm prior to the spinoff using pairwise t-statistics for mean values and Wilcoxon signed-ranks tests for medians. We also report mean and median values for the absolute differences in each statistic.

The results in Table 2 indicate that the parent and unit look quite similar, on average, in terms of many previously hypothesized determinants of board structure. Not surprisingly, spun off units are smaller than both the pre-spinoff and post-spinoff parent firm, on average. There is also some evidence that units have lower free cash flow and lower operating profitability than parents. However, the parent and unit exhibit quite similar market-to-book ratios.

We also provide evidence on the absolute value of differences in characteristics between pairs of firms. These results suggest that the similarities in average characteristics across the groups mask what are actually substantial differences in individual parent-unit pairs. The last two columns of Table 2 indicate that the absolute value of differences in characteristics between the unit and either the pre-spinoff or post-spinoff parent are economically large for all of the characteristics. For example, on average, the market-to-book ratios of the pre-spinoff parent and the unit differ by 1.0. When compared with the pre-spinoff parent market-to-book ratio of 2.0, this absolute difference in growth opportunities is quite substantial. We observe similarly large differences in R&D, capital expenditures, profitability, free cash flow, and leverage between the parent and the unit. Although these differences are smaller when comparing the post-spinoff parent to the pre-spinoff parent, they nonetheless represent meaningful deviations from pre-spinoff parent levels.

In Table 3, we report the destination of pre-spinoff parent CEOs and, more importantly for our purposes, the origin of the CEOs of the post-spinoff firms. Panel A reports on the post-spinoff destination of the CEOs who were in place at the sample firms prior to their spinoffs. Seventy-three of the 143 firms' CEOs remain as CEO of the parent firm only following the spinoff; 12 parent CEOs become unit CEOs only; and five parent CEOs are CEOs of both the parent and the unit following the spinoff.⁹ The pre-spinoff CEOs of the remaining 53 parent firms are not CEOs of either firm following the spinoff.¹⁰ This represents a 37.1% annual CEO turnover rate, much higher than the general annual CEO turnover rate of 15.8% over the 1992-2007 period, as documented in Kaplan (2012).

Panel B of Table 3 details the origins of the CEOs for the newly spun off units and the post-spinoff parent firms. We categorize each post-spinoff CEO as having been the CEO of the pre-spinoff parent firm, a non-CEO employee of the pre-spinoff firm, or an outsider with no employment ties to the pre-spinoff firm.¹¹ Seventy-eight of the remaining parent firms continue to be headed by the same CEO; another two are headed by a former parent firm CEO who was not the most recent CEO. These 80 CEOs are categorized together as having been the CEO of the pre-spinoff parent firm. Of the remaining 63 parent firms, approximately two-thirds (43) promote internal candidates to CEO, while the remaining 20 parent firms hire a new CEO from

⁹ Wruck and Wruck (2002) find a much higher rate of management overlap between the post-spinoff parent and the unit: 33.7% versus 3.5% in our sample (5/143). The difference is due primarily to the fact that Wruck and Wruck consider the Chairperson of the Board as part of the top management team. The vast majority of their management overlap results from post-spinoff parent and unit firms that share a board chair.

¹⁰ In untabulated results, we find no evidence that the likelihood of a CEO leaving the firm is associated with his/her age. Specifically, we find that the average age of CEOs retained by either the parent or the unit is 56.2 years while that of CEOs not retained by either firm is 57.3 years. The difference is not significant at conventional levels.

¹¹ We find that 13.3% of our unit CEOs were the parent CEO prior to the spinoff, 71.3% were a non-CEO employee of the parent firm, and 15.4% were not affiliated with the parent. The comparable figures in Wruck and Wruck (2002) are 30.0%, 45.9%, and 24.1%, respectively.

outside the firm. The incidence of outside hires by the unit firms is very similar to that of the parent firm, with 22 of the new CEOs coming from outside the firm. Of the remaining 122 unit firms, 19 have CEOs who were or still are the parent CEO, including two who were a parent CEO prior to the most recent parent CEO, and 102 have CEOs who were previously non-CEO employees of the parent firm, often the head of the unit division when it was still under the parent firm's ownership.¹² Finally, we classify each post-spinoff CEO according to service on the pre-spinoff parent board. We find that 97 of the post-spinoff parent CEOs and 36 of the unit CEOs served on the pre-spinoff parent board.

Table 4 provides mean values for board size, the number of inside or affiliated directors, the number and proportion of outside directors, and the number of directors who bring particular types of expertise to the board. In order to distinguish among outside directors based on the expertise they bring to the board, we read the profile of each director in the corporate proxy statement and, based on their primary employment background, categorize each outside director as having: expertise in the industry of the post-spinoff unit, expertise in the industry of the parent, expertise in the legal or finance sectors, or other expertise, a category that encompasses all directors whose primary experience does not classify them into the unit, parent, law, or finance categories.^{13,14}

¹² These results indicate that 84.7% of the unit CEOs were previously insiders of the parent firm. The equivalent statistic in Wruck and Wruck's (2002) sample from 1985-1995 is 76.5%. The difference may be accounted for by the difference in time periods, the fact that Wruck & Wruck consider the top two executives for some of their firms, or the fact that they categorize insiders who have been in the parent firm for less than three years as outsiders. Wruck and Wruck do not examine management restructuring in the parent firm.

¹³ These categories are mutually exclusive except when a parent-unit pair is in the same or a highly related industry. In such a case, a director is categorized as having both parent and unit-related expertise.

¹⁴ Directors with financial expertise are labeled as having unit and/or parent expertise if the unit and/or parent are in the financial sector. As an example, Lehman Brothers has board members with direct expertise in wealth management.

We characterize a director as having unit or post-spinoff parent expertise if that director has experience in a firm in the same three-digit SIC industry or has other background that is clearly related to the firm's line of business. Examples of such related backgrounds include: i) a scientist or doctor who is a director for a firm in the pharmaceutical, chemical, medical device, or technology industry; and ii) a director with experience in an industry that is clearly connected to the relevant unit or parent firm's industry, despite having a distinct SIC code.¹⁵

The number of outside directors who have relevant industry expertise, expertise in law or finance, and other expertise are reported in Table 4. We also report two measures of the relative presence of outside experts on the board: the proportion of the total directors who are outside experts and the proportion of the board's industry experts who are outside directors. The latter measure is computed as the number of outside expert directors divided by the number of inside directors plus the number of outside expert directors. We report all Table 4 variables for the pre-spinoff parent, the post-spinoff parent, and the spun off unit. In addition, as in Table 2, we report the absolute values of pair-wise differences in board attributes between the parent and unit firms.

On average, the parent's board declines from 10.6 to 9.6 members following the spinoff. This reflects slight declines in both the number of inside/affiliated directors and the number of independent outside directors (2.3 vs. 2.7 and 7.3 vs. 7.9, respectively). As a result, there is a modest increase in the proportion of independent outside directors (0.74 vs. 0.76). The number of outside directors with relevant industry expertise declines following the spinoff, as do the numbers of outside directors with finance or other expertise.

¹⁵ An example of this is a CEO of a home care management company (SIC = 8082, Home Health Care Services) that is an outside director for a healthcare equipment and supplies company (SIC = 5047, Medical, Dental, and Hospital Equipment and Supplies).

By comparison, the unit has fewer board members than both the pre-spinoff parent (7.6 vs. 10.6) and the post-spinoff parent (7.6 vs. 9.6). The numbers of inside/affiliated and outside directors on the unit board are 1.5 and 6.1, respectively, as compared to 2.7 / 7.9 on the pre-spinoff board and 2.3 / 7.3 on the post-spinoff parent board. The net result is that the unit has a slightly greater proportion of outsiders on the board than do either the pre-spinoff or post-spinoff parent firms. Many of these differences are statistically significant at the 0.05 level, but are economically small. For example, the proportion of independent outsiders on the unit's board is 0.80, as compared with 0.74 for the pre-spinoff parent and 0.76 for the post-spinoff parent.¹⁶ The relative representation of outside directors with industry expertise increases more dramatically, however. For example, the proportion of outside directors who have industry expertise and the proportion of industry experts who are outside directors increase from 0.14 to 0.24 and from 0.36 to 0.45, respectively, relative to the pre-spinoff firm. Differences relative to the post-spinoff firm are quite similar and these differences are all significant at the 1% level.

Again, however, the absolute value of pair-wise differences in board attributes between the parent and unit firms are economically large. On average, the parent firm's board changes its size by 1.5 members, including 0.7 insiders and 1.2 outsiders. Its proportions of outsiders, outside experts, and outside relative to total experts change by 0.07, 0.06, and 0.12, respectively, from prior to the spinoff to following the spinoff. The new unit's board is substantially different from the post-spinoff parent board. On average, the unit's board size differs from that of the parent by 2.6 total members, 1.0 inside/affiliated members, 2.2 outside members, and 1.2 outside

¹⁶ Cusatis, Miles, and Woolridge (1993) document that 21 of the 46 spinoffs in their 1965-1988 sample are acquired within three years of being spun off. To the extent that spinoffs are intended to better position the unit for subsequent acquisition by an outside party, unit boards could be expected to be short-term in nature, in which case directors could be chosen for reasons other than their suitability to govern the assets of the firms in an ongoing manner. However, we find that only 11 of our 143 unit firms are acquired or taken private within three years of being spun off. This much lower incidence most likely arises from our sample requirement that there is a unit proxy statement for the first full year following the spinoff.

experts. The proportions of outsiders, outside experts, and outside relative to total experts change by 0.10, 0.17, and 0.26 relative to the post-spinoff parent firm. The differences between the numbers of unit directors and those of the pre-spinoff parent are even larger, with average absolute differences in board size, number of insiders/affiliated and number of outsiders of 3.3, 1.3, and 2.6 respectively. The differences in proportions of outsiders and outside experts are similar to those differences relative to the post-spinoff parent. We conclude, therefore, that the spinoff results in parent and unit boards that are substantially different from one another, and substantially different from that of the pre-spinoff parent.

Overall the evidence in Section 2 indicates that the sample spinoffs result in unit and remaining parent firms whose individual asset, operations, and board structures differ meaningfully from those of the pre-spinoff combined firms. In addition, there is wide variation in the origin of post-spinoff unit and parent firm CEOs.

3. Post-Spinoff Board Structure in Unit and Parent Firms

We explore the determinants of board structure by analyzing unit firms and post-spinoff parent firms. Because of the de novo feature of unit boards, we focus our analysis on the unit firms and report detailed findings for them in Section 3.1. Our analysis of board structure in post-spinoff parent firms is covered in section 3.2.

3.1. Analysis of unit boards

An important advantage of our experimental design is that our unit firms are newly independent firms that put in place de novo boards from scratch. The benefits of this for an examination of the determinants of board formation are two-fold. First, as newly formed boards,

the likelihood that observed board structure is influenced by any tendency towards stickiness is quite low. Thus, we are more cleanly able to examine firm-specific determinants of board structure. Second, we hypothesize that, as newly independent firms with newly appointed CEOs, there is a greater need for CEO assessment than in firms whose operations and/or CEOs have been in place for some time.

3.1.1. Unit boards vs. matched firms

We begin by comparing the boards of spun off units with those of a matched set of publicly traded firms. Specifically, we compare single-segment (multi-segment) unit firms to other single-segment (multi-segment) firms that share the same primary three-digit SIC code. From among each individual firm's comparison group, we choose the firm whose book value of assets is closest to that of the unit firm. We require that the value of the matched firm's assets falls within +/-50% of that of the unit firm. Where no such matched firm exists at the three-digit SIC level, we choose from among firms matched at the two-digit SIC level; this is necessary for 12 of our unit firms. If there is no proxy statement available for the best match, we choose the next best match. We present a comparison of unit and match firm characteristics in appendix Table A1. These data indicate that the quality of the matching is quite high. Among the characteristics that we analyze, only mean and median debt ratios, median market-to-book ratios, and median R&D-to-assets ratios differ significantly at the 10% level. Moreover, the differences in median market-to-book ratios (1.51 vs. 1.55) and R&D-to-assets ratios (0.005 vs. 0.000) are economically quite small.

Table 5 presents univariate comparisons of individual aspects of board structure between the unit firms and their matched firms. The results indicate that there are significant differences

in board structure between unit and matched firms. Relative to their matched firms, unit firms have boards that are smaller in size and are made up of higher fractions of outside directors, and higher fractions of outside directors with relevant industry expertise. The median unit firm has 7.0 directors (vs. 8.0 for the matched firms), of which 83.3% are outsiders (vs. 71.4% for the matched firms), and 20.0% are outsiders with industry expertise (vs. 10.0% for the matched firms). Of the total number of directors who have industry expertise, 50% of them are outside directors (vs. 25% for the matched firms). These differences are all significant at the 1% level. The differences in outside director representation appear to be driven by differences in industry expertise; there are no significant differences across the two groups in terms of the number or percentage of outsiders with finance, law, or other expertise.

We explore these differences further in a multivariate framework in which we control for firm characteristics that have been found to be significant determinants of board structure in prior studies. Using the combined unit-match sample, we regress each board characteristic for which we observe significant unit-match differences in Table 5 on a dummy variable that takes a value of 1 if the firm is a spun off unit, firm size as measured by the natural log of the book value of total assets, the market-to-book ratio, the ratio of R&D expense to total assets, and the ratio of operating income before depreciation to total assets.¹⁷

The results, reported in Table 6, indicate that, among the firm characteristics included, firm size is the only significant determinant of board size and the fraction of outside directors. There is some evidence that market-to-book ratio and R&D, as well as firm size, affect the presence on the board of outsiders with relevant industry expertise. Controlling for these

¹⁷ Our results are qualitatively similar if we include other firm characteristics; e.g. measures of capital expenditures, free cash flow, leverage, tangible assets, or Herfindahl index. In the interests of parsimony, we exclude from our final regressions those variables which are uniformly statistically insignificant.

traditional determinants of board structure, we continue to find significant differences between the board structures of unit and matched firms. The coefficients on the unit dummy variables indicate that unit boards are smaller, have higher fractions of outsiders and of outsiders with relevant industry expertise, and derive a greater fraction of their industry expertise from outside directors than do matched firm boards. These coefficients are all significant at the 1% level.

3.1.2. The role of CEO assessment

If CEO assessment is more effectively done by smaller boards with more industry expert outside directors, our findings in Table 6 are consistent with learning and assessment being an important element of board structure. However, these results are also consistent with matched firm boards exhibiting stickiness that prevents them from having the most effective board structure possible.

In order to test the learning/assessment hypothesis more directly, we use the unit CEO's background to identify subsets of our data for which we conjecture that learning and assessment will be more important. As noted in Table 3, the CEOs of the post-spinoff parent and unit firms come from a variety of sources. We propose that assessment will be more important for unit CEOs who were internal promotions or outside hires, and for unit CEOs who were not on the pre-spinoff parent board.

We expect there to be less need for CEO assessment when the unit CEO was previously the CEO of the pre-spinoff parent firm because such a person has both experience as a CEO and prior involvement with the assets and operations of the unit firm. A unit CEO who was previously a non-CEO employee of the firm also has prior involvement with unit firm assets and operations, but because this involvement occurred at a level below the CEO position, it is likely

to have been less visible. More importantly, there has been no opportunity to observe such a person's inherent suitability to serve as a CEO. Unit CEOs who are hired from outside may or may not have prior experience as a CEO; however they have no previous involvement with the unit firm's assets and operations. We also expect there to be less need for assessment of unit CEOs who served on the pre-spinoff board of directors and have therefore had an oversight role with respect to the assets and operations of the unit firm prior to becoming its CEO.

In Panel A of Table 7, we present univariate evidence related to whether the origin of the post-spinoff CEO is associated with the structure of the board by comparing unit firms to their matched firms across unit CEO source categories. Our findings suggest that the differences in board structure between unit and matched firms documented in Tables 5 and 6 are driven by unit firms with CEOs for whom there is greater need for assessment. Unit firms whose CEOs were the CEO of the pre-spinoff parent firm exhibit no significant differences in board structure relative to their matched firms. In contrast, the boards of unit firms whose CEOs were promoted from the pre-spinoff parent have boards that are smaller (7.7 vs. 8.4 directors), have higher fractions of outside directors (80.4% vs. 69.5%), have higher fractions of outside directors with relevant industry expertise (22.9% vs. 14.7%), and derive a greater proportion of their industry expertise from outside directors (0.44 vs. 0.30). These differences are all significant at the 1% level and are economically large.

The results for pairs in which the unit CEO was hired from outside are similar, though slightly weaker. The unit-match differences in the percentage of insiders and outsiders are of equivalent magnitude and significance to those for the internal promotion subsample. The difference in the fraction of industry expertise that comes from outside directors is also of similar magnitude and is significant at the 5% level. However, differences in board size and the fraction

of outsiders with industry expertise, though of similar magnitude to those for internal promotions, do not differ significantly from zero.

We note that for the cases in which the unit's CEO had been the CEO of the pre-spinoff parent, differences between unit and match firm boards, though statistically insignificant, are reasonably large. Because there are only 19 such cases, this raises the possibility that the lack of statistical significance is due to a lack of power. However, our interpretation of these results as evidence that differences in board structure reflect differences in the need for assessment is strengthened by the fact that the differences in board structure between unit and matched firms are largest for outside hires, then inside appointments, and are smallest in the cases of pre-spinoff parent CEOs.

Panel B of Table 7 provides results using the alternative classification of CEO background in which we characterize unit CEOs based on whether or not they served on the board of the pre-spinoff parent firm. Consistent with the Panel A results, the Panel B results generally indicate no significant differences in board structure between unit firms whose CEOs were on the pre-spinoff parent boards and their matched firms, the exception being the proportion of outsiders. In contrast, unit firms whose CEOs were not previously on their parent firm boards have smaller and more independent boards, more outside director industry expertise, and a greater proportion of their industry expertise coming from outside directors than do their matched firms. These differences are significant, both economically and statistically. Again, these findings suggest that differences between unit and matched firm boards are driven by the subset of firms for which there is a greater need for CEO assessment.

Because our findings in Table 7 imply that the assessment of the CEO is a potentially important element of board structure, we examine our unit firm boards in a multivariate setting in

which we include our proxies for the need for assessment along with other previously-documented determinants of board structure. Specifically, Table 8 presents the results of regressions of individual board characteristics on dummy variables for CEO source and pre-spinoff board service and the aforementioned firm characteristics: size, market-to-book, R&D, and operating income.

Our findings in Table 8 provide some further support for the hypothesis that learning and assessment is an important element of unit board structure. The direction and magnitude of the Table 8 results indicate that the boards of unit firms whose CEOs were promoted from the parent firm or hired from outside or, alternatively, were not on the pre-spinoff parent board have boards that are smaller, more independent, and rely more on outside directors with industry expertise than do the boards of unit firms whose CEO was the CEO of the pre-spinoff parent firm. Board size (models 8.1 and 8.2) is smaller when the CEO is hired from outside, is internally promoted, or was not on the pre-spinoff board, though the latter two results are not quite significant at conventional levels (p -value = 0.12). The results for percent outsiders (models 8.3 and 8.4) indicate that boards are more independent when the CEO was not on the pre-spinoff board (significant at the 1% level) and when the CEO was an outside hire (significant only at the 12% level). The CEO background variables do not significantly impact the fraction of the directors who have unit expertise (models 8.5 and 8.6). However, the percentage of industry expertise that comes from outside directors (models 8.7 and 8.8) is higher when the unit CEO was not on the prior board; this result is significant at the 10% level.¹⁸

¹⁸ Our sample period spans the adoption of the Sarbanes-Oxley Act (SOX) in 2002 and the nearly simultaneous revisions in listing requirements adopted by the major exchanges. It is unclear how these regulatory changes would affect the impact of CEO origin on board structure; thus we do not expect these regulatory changes to affect our main findings. Nonetheless, as a robustness check, we re-estimate our Table 8 regressions including a dummy variable for spinoffs completed in the post-SOX period. The CEO source results are qualitatively similar, with the following exceptions: the coefficient on ‘CEO was internally promoted’ becomes significant at the 0.10 level in

In addition, we find that, consistent with recent advising and monitoring models of board structure and with prior empirical evidence, board size and the fraction of outsiders on the board are significantly positively related to firm size. The fraction of outsiders and the fraction of experts who are outsiders are significantly positively related to the market-to-book ratio in the models that include outside hire and internal promotion dummies. However, these relationships become marginally insignificant in the models that include the not-on-parent-board dummy variable. Finally, the fraction of outside directors who have industry expertise is negatively related to the operating income ratio; this result is significant at the 10% level.

3.1.3. Distinguishing assessment from advising and monitoring

In this section, we discuss and provide further evidence on the extent to which the spinoff setting helps to isolate the importance of the board's assessment role from its two other primary functions, advising and monitoring. Specifically, we consider whether our findings for assessment can be explained by differences in the relative importance of the board's advising and monitoring roles.

It is unclear, a priori, whether spun off units would have more or less demand for board advising than their matched firms. On the one hand, as newly independent firms, many of which have new CEOs, one might argue that spun off units would place relatively more importance on advising. To the extent that inside directors possess incremental firm-specific knowledge that is useful for advising [Fama and Jensen (1983)], we expect that, all else equal, unit boards requiring more advising will have a larger proportion of insiders on the board. On the other

model 8.1, while the coefficients on 'Unit CEO_{t+1} was *not* on prior board' become significant at the 0.10 level in model 8.2 and marginally insignificant in model 8.8.

hand, it is possible that if the unit maintains some connection with the parent and that parent plays an advisory role, this would decrease the relative importance of the board's advisory role.

Our data can help shed light on these possibilities by again exploiting cross-sectional differences in the origin of the unit CEO. If the boards of spun off units are structured to provide greater advice, we expect this to be most prevalent among the subset of units for which there is a new CEO – either an outside hire or an inside appointment. Contrary to increased demand for advising, however, we find that these unit boards actually have a greater proportion of independent *outsiders* on the board than their matched firms. On the other hand, if the parent plays an advisory role, we expect this to be particularly true in the subset of firms for which the unit CEO is the former CEO of the parent.¹⁹ Again, our data is inconsistent with this view. Contrary to reduced demand for advising among unit firms in which the unit CEO had been the parent CEO, we find no evidence that boards of unit firms are more independent than their matched firms. By contrast, all of this evidence is consistent with an increased importance of assessment in unit boards of firms in which the unit CEO was not the CEO of the parent.

To provide further evidence on a unique role for assessment in unit boards, we contrast the boards of our spun off units with those of IPO firms. We expect that CEO assessment is less of a concern for IPO firms than for unit firms because the CEOs of the IPO firms are often the founders or professional managers who took office prior to the IPO. Advising, on the other hand, is likely to be of greater importance for IPO firms than for unit firms, given that IPO firms are typically younger firms in high-growth industries. Consistent with a reduced importance of assessment in IPO boards relative to spun off units, evidence in Baker and Gompers (2003) and

¹⁹ We also note that within this subset of firms, 49.9% of the unit directors had previously been on the board of the parent firm. This compares with 27.8% of the unit directors when the unit CEO is an internal promotion and 25.7% when the unit CEO is an outside hire.

Boone, Field, Karpoff, and Raheja (2007) indicate that boards of IPO firms tend to be more insider dominated and to have less industry expertise among the outside directors than do the boards of our spun off units. We conclude, therefore, that our findings for unit boards cannot be explained by differences in the relative importance of advising in the unit firms.

Our evidence that unit boards have a greater proportion of outsiders and a greater proportion of outsiders with industry expertise is potentially consistent with these boards having a greater need for monitoring. However, if the board's monitoring role is tied to potential moral hazard or other agency conflicts, we do not expect these to be systematically different in units than in their matched firms. By contrast, because one of the distinguishing features of the spinoff transaction is that it creates a newly independent firm with a newly appointed CEO, the firm's prospects and/or the CEO's ability are more uncertain. This increases the relative importance of assessment. Furthermore, though the source of CEO for the unit provides for useful cross-sectional variation in the need for CEO assessment, we are unable to make any case for it being associated with the need for monitoring. Finally, by first matching the unit firms to firms of similar size in the industry, then directly controlling for variables from the board literature, our empirical design attempts to directly control for the demand for monitoring and advising from the board. Overall, therefore, our findings support the differential importance of assessment in our unit firms, above and beyond any potential differential need for advising and/or monitoring.

3.2. Analysis of parent boards

Our results thus far suggest that the need to assess CEO ability, competence, and match to the firm is an important determinant of the board structure of unit firms. The boards of firms

for which this need is likely to be greatest – i.e. newly independent firms with newly appointed CEOs – are smaller, more independent, and rely more on outside directors who have relevant industry expertise than the boards of their publicly traded matched firms. As noted earlier, this need for assessment is likely to be less important in post-spinoff parent firms. Although some of the parents will have newly appointed CEOs, boards will already possess much greater information about the firm’s prospects. Therefore, an analysis of post-spinoff parent boards is one way to provide further evidence on the importance of learning and assessment in board formation.

An additional reason to examine the parent board is that our tests of the importance of learning and assessment in the unit could be subject to an endogeneity criticism. Specifically, whether the unit CEO is an external hire, an internal promotion, or is the pre-spinoff parent CEO is an endogenous choice, as is board structure. If the underlying reason for choosing a particular type of CEO is also a determinant of board structure, this potentially weakens our interpretation of the learning/assessment tests. As one example, perhaps the source of CEO is correlated the need for monitoring. Although this explanation seems less plausible in light of our specific results with respect to the significance of differences between unit boards and their matched counterparts, we nonetheless view tests of parent board structure as useful additional tests. If our evidence of learning/assessment in unit firms is driven by the endogeneity of CEO source and board structure, we should obtain similar results in tests of parent board structure. On the other hand, if our findings on unit boards are due to the importance of learning and assessment, we expect these learning/assessment variables to be less important in parent boards.

We repeat the Table 8 regressions for the post-spinoff parent firms and report the results in Table 9. Consistent with the results for the unit firms, there are significant negative

associations between board size and dummies indicating that the post-spinoff parent CEO was hired from outside or was not on the pre-spinoff parent board. However, in contrast to our findings for unit firms, we find no evidence that the proportion of outside directors, the proportion of directors that are outsiders with industry expertise or the proportion of industry expert directors that are outsiders are associated with our proxy variables for the need for assessment. These results are consistent with learning and assessment being less important for the parent firms than for the unit firms and provide some reassurance that our findings for unit firms are not driven by the endogeneity of CEO choice. A potential caveat to this interpretation, however, is that, although the parent board is restructured following the spinoff, it is not created from scratch as is the unit board. Therefore, we cannot rule out the possibility that there could still be some residual stickiness in its structure that impedes our ability to detect the impact of assessment.

Our findings for parent firm boards in Table 9 also indicate that traditional determinants of board structure play a similar but somewhat more significant role in the structures of parent firm boards than in those of unit firm boards. Board size is significantly positively related to firm size and market-to-book ratio; the fraction of outsiders is significantly related to firm size; and the fraction of industry experts who are outside directors is positively related to R&D. This suggests that as the need for the board to assess the inherent suitability of the CEO weakens, characteristics of the firms' assets and operations become more important determinants of board structure.

4. Summary and Conclusions

We exploit the unique opportunities offered by spinoff transactions to explore the formation of corporate boards. The separation of one publicly-traded firm into two publicly-traded firms results in a newly independent unit firm that must appoint a CEO and form a board from scratch. This allows us to examine determinants of board structure in a setting that is relatively free of the factors that contribute to board stickiness and that provides useful variation in the need to assess the CEO's inherent ability, competency, and match to the firm.

We find that newly formed unit boards whose CEOs were promoted from the parent firm or hired from outside are smaller, have relatively more outside directors, have more directors with same-industry experience, and derive more of their industry expertise from outside directors than do their publicly-traded matched firm boards. This supports the hypothesis that boards of newly independent unit firms with untested CEOs have more to learn about the inherent suitability of their CEOs and that such learning is best accomplished by independent outsiders who have industry knowledge and incentives to avoid free-riding. Analysis of the post-spinoff parent firms reveals much less impact of assessment proxies on board structure, consistent with CEO assessment being less important for these continuing firms. We also find evidence that characteristics of firm asset and operating structures are somewhat more important determinants of board structure in these post-spinoff parent firms than in unit firms.

Though traditional agency models of corporate governance clearly have empirical validity, our overall findings are consistent with Hermalin and Weisbach's (2014) view that learning models of managerial competence offer a complementary lens through which to study and evaluate corporate governance. Our evidence confirms the importance of such models for one particular corporate governance mechanism: the board of directors. Evaluation of the

importance of learning and assessment for other governance mechanisms offers the promise of additional useful insights into governance systems.

In addition, our findings are suggestive of there being corporate governance benefits from the spinoff itself.²⁰ We find that the boards of our unit and parent firms following the spinoff differ significantly from each other and from the pre-spinoff parent board that governed the combined firms. This suggests the possibility that the separated firms are each able to better tailor their board structures to their particular assets and leadership. Although we do not provide direct evidence that the observed changes in board structure are necessarily value-increasing, our analysis of the de novo unit board implicitly assumes that these boards are formed in a way that optimally trades off considerations related to the advising, monitoring, and assessment roles of the board. Moreover, both Ahn and Walker (2007) and Seward and Walsh (1996) argue that spinoffs appear less likely to be undertaken for self-serving reasons because the transactions significantly reduce the scope of assets under the control of existing managers and board members.²¹ Further exploration of the potential governance benefits of spinoffs and other asset restructurings represent a worthwhile area for future research.

²⁰ Wruck and Wruck (2002) also conjecture that governance changes represent “a potentially important, but often overlooked, source of value creation in spinoff transactions” (p.178).

²¹ In contrast, Fich, Starks, and Yore (2014) provide evidence in a small sample of spinoffs that compensation structures in firms with weak board monitoring reward top management for simply doing deals, irrespective of whether those deals are value-increasing.

References

- Adams, R., B. Hermalin, and M. Weisbach. 2010. The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature* 48:58-107.
- Agrawal, A., and C. Knoeber. 2001. Do some outside directors play a political role? *Journal of Law and Economics* 44:179-198.
- Ahn, S., and M. D. Walker. 2007. Corporate governance and the spinoff decision. *Journal of Corporate Finance* 13:76-93.
- Baker, M., and P. Gompers. 2003. The determinants of board structure at the initial public offering. *Journal of Law and Economics* 46:569-598.
- Boone, A., L. Field, J. Karpoff, and C. Raheja. 2007. The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics* 85:66-101.
- Borokhovich, K., R. Parrino, and T. Trapani. 1996. Outside directors and CEO selection. *Journal of Financial and Quantitative Analysis* 31:337-355.
- Brickley, J., J. Coles, and R. Terry. 1994. Outside directors and the adoption of poison pills. *Journal of Financial Economics* 35:371-390.
- Brickley, J., and J. Zimmerman. 2010. Corporate governance myths: Comments on Armstrong, Guay and Weber. *Journal of Accounting and Economics* 50:235-245.
- Byrd, J., and K. Hickman. 1992. Do outside directors monitor managers? Evidence from tender offer bids. *Journal of Financial Economics* 32:195-222.
- Chung, J., B. A. Sensoy, L. H. Stern, and M. S. Weisbach. 2012. Pay for performance from future fund flows: The case of private equity. *Review of Financial Studies* 25:3259-3304.
- Coles, J., N. Daniel, and L. Naveen. 2008. Boards: Does one size fit all? *Journal of Financial Economics* 87:329-356.
- Coles, J., N. Daniel, and L. Naveen. 2013, Co-opted boards. *Review of Financial Studies*, forthcoming.
- Cotter, J., A. Shivdasani, and M. Zenner. 1997. Do outside directors enhance target shareholder wealth during tender offer contests? *Journal of Financial Economics* 43:195-218.
- Cusatis, P. J., J. A. Miles, and J. R. Woolridge. 1993. Restructuring through spinoffs: The stock market evidence. *Journal of Financial Economics* 33:293-311.

- Daniel, N., J. McConnell, and L. Naveen. 2011. The advisory role of multinational directors in US firms. Working Paper.
- Dass, N., O. Kini, V. Nanda, B. Onal, and J. Wang. 2013. Board expertise: Do directors from related industries help bridge the information gap? *Review of Financial Studies* 27:1533-1592.
- Denis, D., and A. Sarin. 1999. Ownership and board structures in publicly traded corporations. *Journal of Financial Economics* 52:87-224.
- Drobetz, W., F. V. Meyerinck, D. Oesch, and M. M. Schmid. 2014. Is board industry experience a corporate governance mechanism? Working Paper, University of Hamburg, University of St. Gallen.
- Eisenberg, T., S. Sundgren, and M. Wells. 1998. Larger board size and decreasing firm value in small firms. *Journal of Financial Economics* 48:35-54.
- Fahlenbrach, R., A. Low, and R. Stulz. 2010. Why do firms appoint CEOs as outside directors? *Journal of Financial Economics* 97:12-32.
- Faleye, O., R. Hoitash, and U. Hoitash. 2012. Industry expertise on corporate boards. Working Paper, Northeastern University, Bentley University.
- Fama E., and M. Jensen. 1983. Separation of ownership and control. *Journal of Law and Economics* 26:301-326.
- Fich E. M., L. T. Starks, and A. Yore. 2014. CEO deal making activities and compensation. *Journal of Financial Economics* 114:471-492.
- Field, L., M. Lowry, and A. Mkrtchyan. 2013. Are busy boards detrimental? *Journal of Financial Economics* 109:63-82.
- Gibbons, R. and K. J. Murphy. 1992. Optimal incentive contracts in the presence of career concerns: Theory and evidence. *Journal of Political Economy* 100:468-505.
- Goldman, E., J. Rocholl, and J. So. 2009. Do politically connected boards affect firm value? *Review of Financial Studies* 22:2331-2360.
- Harris, M., and A. Raviv. 2008. A theory of board control and size. *Review of Financial Studies* 21:1797-1832.
- Hermalin, B. 2005. Trends in corporate governance. *Journal of Finance* 60: 2351-2384.
- Hermalin, B., and M. Weisbach. 1998. Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review* 88:916-118.

- Hermalin, B., and M. Weisbach. 2014. Understanding corporate governance through learning models of managerial competence. Working Paper, University of California, Berkeley, Ohio State University.
- Kaplan, S. 2012. How has CEO turnover changed? *International Review of Finance* 12:57-87.
- Lehn, K., S. Patro, and M. Zhao. 2009. Determinants of the size and composition of U.S. corporate boards: 1935-2000. *Financial Management* 38:747-780.
- Lim, J., B. A. Sensoy, and M. S. Weisbach. 2014. Indirect incentives of hedge fund managers, Working Paper, Ohio State University.
- Linck, J., J. Netter, and T. Yang. 2008. The determinants of board structure. *Journal of Financial Economics* 87:308-328.
- Masulis, R., C. Ruzzier, S. Xiao, and S. Zhao. 2012, Do independent expert directors matter? Working Paper, University of New South Wales, Universidad de San Andres, University of Minnesota, Grenoble Ecole de Management.
- Masulis, R., C. Wang, and F. Xie. 2012, Globalizing the boardroom: The effects of foreign directors on corporate governance and firm performance, *Journal of Accounting and Economics* 53:527-554.
- Pan, Y., T. Y. Wang, and M. S. Weisbach. 2015. Learning about CEO ability and stock return volatility, *Review of Financial Studies*, forthcoming.
- Raheja, C. 2005. Determinants of board size and composition: A theory of corporate boards. *Journal of Financial and Quantitative Analysis* 40:283-306.
- Schwartz-Ziv, M., M. Weisbach, 2013, What do boards really do? Evidence from minutes of board meetings, *Journal of Financial Economics* 108: 349-366.
- Seward, J. K., and J. P. Walsh. 1996. The governance and control of voluntary corporate spin-offs. *Strategic Management Journal* 17:25-39.
- Taylor, L. A. 2013. CEO wage dynamics: Estimates from a learning model. *Journal of Financial Economics* 108:79-98.
- Weisbach, M. 1988. Outside directors and CEO turnover. *Journal of Financial Economics* 20:431-460.
- Wruck, E. G., and K. H. Wruck. 2002. Restructuring top management: Evidence from corporate spinoffs. *Journal of Labor Economics* 20:7176-218.
- Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40:185-212.

Table 1

Time profile of sample spinoffs

	Number	Percentage of sample
1994	8	5.6%
1995	8	5.6%
1996	14	9.8%
1997	9	6.3%
1998	10	7.0%
1999	11	7.7%
2000	18	12.6%
2001	9	6.3%
2002	7	4.9%
2003	4	2.8%
2004	5	3.5%
2005	9	6.3%
2006	2	1.4%
2007	7	4.9%
2008	14	9.8%
2009	3	2.1%
2010	5	3.5%
Total	143	100.0%

Table 2

Univariate statistics of spinoff firms

Mean statistics are reported in the first row and medians are reported in the second. M/B is the market value of equity plus the book value of assets minus the book value of equity, divided by the book value of assets. R&D is research and development expenses (recorded as 0 if missing in Compustat). TA is total book assets. CX is capital expenditures. OIBD is operating income before depreciation. FCF is free cash flow defined as net income plus depreciation minus capital expenditures. D is long term debt plus the short term portion of long term debt. PPE is net plant, property and equipment. Herfindahl is calculated using industry sales at the four-digit SIC level. All variables for the pre-spinoff parent are measured as of the fiscal year ending just prior to the spinoff. Variables for the post-spinoff parent and unit are measured as of the first fiscal year following the spinoff. Two-population, two-tailed T-tests (Wilcoxon sign-rank tests) are used to compare means (medians) for differences between the pre-spinoff parent, the post-spinoff parent, and the unit. ***, **, and * denote significance at the 1%, 5%, and 10% levels. a, b, and c denote significance at the 1%, 5%, and 10% levels for comparisons between the post-spinoff parent and the unit.

	Pre-spinoff parent (1)	Post- spinoff parent (2)	Unit (3)	Absolute value of difference (2)-(1)	Absolute value of difference (3)-(1)	Absolute value of difference (3)-(2)
M/B	2.008 1.593	1.978 1.549	1.910 1.508	0.640 0.296	0.977 0.406	1.221 0.542
R&D/TA	0.031 0.006	0.030 0.007	0.050***a 0.005	0.013 0.001	0.036 0.011	0.040 0.011
CX/TA	0.051 0.044	0.052 0.040	0.059 0.042	0.020 0.012	0.039 0.025	0.044 0.030
OIBD/TA	0.120 0.121	0.130 0.113	0.088**b 0.122	0.052 0.027	0.128 0.085	0.148 0.085
FCF/TA	0.013 0.024	0.021 0.028	-0.065***a 0.024**a	0.082 0.042	0.155 0.070	0.159 0.087
D/TA	0.234 0.224	0.275** 0.231***	0.226 0.183c	0.099 0.045	0.185 0.130	0.232 0.163
TA (millions)	24,077 3,179	18,444* 2,943***	4,807**a 610***a	6,808 514	19,517 2,231	14,827 2,064
PPE/TA	0.264 0.206	0.268 0.209	0.290 0.199	0.053 0.029	0.126 0.083	0.139 0.077
Herfindahl	0.202 0.170	0.200 0.169	0.186 0.140	0.022 0.011	0.126 0.077	0.121 0.078

Table 3

Univariate statistics on the destination of the pre-spinoff parent CEO and the origin of the post-spinoff parent and unit CEOs. The destinations and origins of the CEOs are as reported in the last proxy preceding the spinoff and the first proxy subsequent to the spinoff.

<i>Panel A: Destination of pre-spinoff parent CEO</i>		
Firms ^a	143 ^a	
CEO of post-spinoff parent only	73	
CEO of unit only	12	
CEO of both post-spinoff firms	5	
CEO of neither post-spinoff firm	53	

<i>Panel B: Origin of post-spinoff CEOs</i>	CEO of post-spinoff parent	CEO of unit
Firms	143	143 ^b
CEO of pre-spinoff parent	80 ^c	19 ^c
Non-CEO employee of pre-spinoff parent	43	102
Outside hire	20	22
Was on pre-spinoff parent board	97	36

^a Two of the 143 parent firms in the sample report two CEOs each prior to the spinoff. The first such firm, Graphic Packaging International, had two Coors brothers as co-CEOs. Following their spinoff of Coorstek, one brother remained as the sole CEO at the parent firm. A third family member became CEO of Coorstek. In the other transaction, Autonation's spinoff of ANC Rental Corp., both the spun off unit and the remaining firm hired new CEOs from outside.

^b One unit firm has two CEOs. David Corriveau and James "Buster" Corley re-assumed the CEO position of the firm they co-founded, "Dave and Buster's", following the spinoff from Edison Brothers Stores. Edison Brothers had previously acquired the firm.

^c We include the two comeback CEOs for the parent firms and the two comeback CEOs for the unit firms in this group.

Table 4

Univariate comparisons of board characteristics

Two-population, two-tailed T-tests are used to compare means for differences between the pre-spinoff parent, the post-spinoff parent and the unit. Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. Data for the pre-spinoff parent are obtained from the last proxy statement prior to the spinoff. Data for the post-spinoff parent and unit are obtained from the first proxy statement following the spinoff. ***, **, and * denote significance at the 1%, 5%, and 10% levels for comparisons between pre-spinoff and post-spinoff parent firms, and between the unit and the parent firms. a, b, and c denote significance at the 1%, 5%, and 10% levels for comparisons between post-spinoff parent and the unit.

	Pre-spinoff parent (1)	Post- spinoff parent (2)	Unit (3)	Absolute value of difference (2)-(1)	Absolute value of difference (3)-(1)	Absolute value of difference (3)-(2)
Total	10.59	9.58***	7.64***a	1.45	3.31	2.57
Inside/Affiliated	2.67	2.29***	1.52***a	0.71	1.30	0.97
Outside directors	7.92	7.29***	6.12***a	1.24	2.62	2.17
Outside expert	1.48	1.31**	1.70 b	0.49	1.20	1.24
Finance/Law/Other	6.44	5.98***	4.42***a	1.23	2.69	2.43
Finance	1.85	1.62**	1.26***a	0.66	1.17	1.20
Law	0.34	0.31	0.30	0.11	0.36	0.38
Other	4.25	4.04*	2.86***a	0.85	2.05	2.03
Outside/Total	0.74	0.76**	0.80***a	0.07	0.11	0.10
Outside expert/Total	0.14	0.15	0.24***a	0.06	0.16	0.17
Outside expert/Total expert	0.36	0.33	0.45*** a	0.12	0.24	0.26

Table 5

Univariate comparisons of unit and matched firm board characteristics

Means are listed in the first row and medians are listed in the second row. Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. Two-population, two-tailed T-tests (Wilcoxon sign-rank tests) are used to compare means (medians) for differences between the pre-spinoff parent, the post-spinoff parent, and the unit. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	<u>Unit board</u>		<u>Matched firm board</u>	
	<u># Dirs.</u>	<u>% Dirs.</u>	<u># Dirs.</u>	<u>% Dirs.</u>
# Directors	7.64**		8.20	
	7.00***		8.00	
Inside/Affiliated	1.52***	20.3***	2.48	31.4
	1.00***	16.7***	2.00	28.6
Outside	6.12*	79.7***	5.71	68.6
	6.00*	83.3***	5.00	71.4
Unit/Match expertise	1.70***	24.2***	1.23	15.7
	2.00***	20.0***	1.00	10.0
Finance/Law/Other	4.42	55.5	4.48	52.9
	4.00	57.1	4.00	55.6
Finance	1.26	16.8	1.35	17.0
	1.00	14.3	1.00	14.3
Law	0.30	3.6	0.38	4.8
	0.00*	0.0	0.00	0.0
Other	2.86	35.1	2.75	31.1
	3.00	40.0	2.00	28.6
Outside expert/Total expert	0.45***		0.30	
	0.50***		0.25	

Table 6

Unit and match board regressions using firm characteristics.

The dependent variables are the listed board characteristic for each unit and matched firm. Unit is an indicator denoting a unit firm. Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. Unit is an indicator for the unit firm. LN(TA) is the natural log of total book assets. M/B is the market value of equity plus the book value of assets minus the book value of equity, divided by the book value of assets. R&D is research and development expenses (recorded as 0 if missing in Compustat). OIBD is operating income before depreciation. P-values are listed in parentheses below the coefficient. Robust standard errors are used.

	Board Size (5.1)	% Outside (5.2)	% Outside expert (5.3)	Outside expert/ Total expert (5.4)
Unit	-0.588 (0.015)	0.111 (0.000)	0.084 (0.000)	0.152 (0.000)
LN(TA)	0.525 (0.000)	0.023 (0.000)	0.005 (0.428)	0.022 (0.040)
M/B	-0.035 (0.690)	0.006 (0.266)	0.010 (0.239)	0.021 (0.036)
RD/TA	1.711 (0.395)	0.004 (0.976)	0.367 (0.095)	0.374 (0.212)
OIBD/TA	1.236 (0.161)	0.002 (0.977)	-0.136 (0.165)	-0.107 (0.452)
Constant	4.683 (0.000)	0.527 (0.000)	0.098 (0.055)	0.107 (0.178)
N	286	286	286	286
R-squared	0.234	0.214	0.112	0.095

Table 7

Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. Two-population, two-tailed T-tests are used to compare means for differences between unit and matched firm boards. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	Panel A Post-Spinoff Unit Boards and Matched Firm Boards											
	Pre-spinoff parent CEO (n=19)		Matches (n=19)		Inside appointment (n=102)		Matches (n=102)		Outside hire (n=22)		Matches (n=22)	
	# Dirs.	% Dirs.	# Dirs.	% Dirs.	# Dirs.	% Dirs.	# Dirs.	% Dirs.	# Dirs.	% Dirs.	# Dirs.	% Dirs.
# Directors	7.89		7.58		7.74**		8.43		7.00		7.63	
Inside/Affiliated	2.16	25.6	2.47	34.0	1.46***	19.6***	2.48	30.5	1.27***	18.5***	2.50	33.4
Outside	5.74	74.4	5.11	66.0	6.27	80.4***	5.95	69.5	5.73	81.5***	5.14	66.6
Unit/Match expertise	1.74	24.9	1.26	18.6	1.62**	22.9***	1.21	14.7	2.05	29.5	1.32	17.6
Finance/Law/Other	4.00	49.5	3.84	47.4	4.66	57.5	4.75	54.8	3.68	51.9	3.82	49.0
Outside expert/ Total expert	0.43		0.28		0.44***		0.30		0.54**		0.29	

Table 7, continued

	Post-Spinoff Unit Board and Matched Firm Boards							
	CEO on parent board pre-spinoff (n=36)				CEO <i>NOT</i> on parent board pre-spinoff (n=107)			
	<u># Dirs.</u>	<u>% Dirs.</u>	<u># Dirs.</u>	<u>% Dirs.</u>	<u># Dirs.</u>	<u>% Dirs.</u>	<u># Dirs.</u>	<u>% Dirs.</u>
# Directors	7.86		8.11		7.57**		8.22	
Inside/Affiliated	2.19	27.4**	2.67	34.5	1.30***	17.9***	2.42	30.3
Outside	5.67	72.6**	5.44	65.5	6.27*	82.1***	5.80	69.7
Unit/Match expertise	1.50	21.0	1.31	17.5	1.77***	25.3***	1.21	15.0
Finance/Law/Other	4.17	51.6	4.14	48.0	4.50	56.9	4.60	54.6
Outside expert/ Total expert	0.37		0.31		0.48***		0.30	

Table 8

Regressions on unit board characteristics post spin-off.

Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. P-values are listed in parentheses below the coefficient. LN(TA) is the natural log of total book assets. M/B is the market value of equity plus the book value of assets minus the book value of equity, divided by the book value of assets. R&D is research and development expenses (recorded as 0 if missing in Compustat). OIBD is operating income before depreciation. Robust standard errors are used.

	Board size	Board size	% Outside	% Outside	% Unit expertise	% Unit expertise	Outside expert/ Total expert	Outside expert/ Total expert
	(8.1)	(8.2)	(8.3)	(8.4)	(8.5)	(8.6)	(8.7)	(8.8)
Unit CEO was outside hire	-1.131 (0.063)		0.061 (0.119)		0.056 (0.388)		0.113 (0.208)	
CEO was internally promoted	-0.869 (0.121)		0.030 (0.464)		0.021 (0.719)		0.015 (0.858)	
Unit CEO _{t+1} was <i>not</i> on prior board		-0.655 (0.119)		0.083 (0.003)		0.050 (0.269)		0.105 (0.094)
LN(TA)	0.512 (0.000)	0.517 (0.000)	0.016 (0.003)	0.013 (0.005)	0.005 (0.613)	0.004 (0.725)	0.022 (0.151)	0.018 (0.240)
M/B	0.139 (0.341)	0.158 (0.281)	0.012 (0.028)	0.008 (0.105)	0.011 (0.420)	0.009 (0.509)	0.026 (0.062)	0.021 (0.108)
RD/TA	-0.079 (0.980)	0.022 (0.994)	-0.168 (0.393)	-0.161 (0.368)	0.303 (0.308)	0.303 (0.295)	0.089 (0.811)	0.088 (0.802)
OIBD/TA	0.783 (0.530)	0.668 (0.582)	0.008 (0.928)	0.010 (0.902)	-0.249 (0.061)	-0.253 (0.052)	-0.230 (0.204)	-0.254 (0.133)
Constant	4.772 (0.000)	4.405 (0.000)	0.650 (0.000)	0.639 (0.000)	0.172 (0.052)	0.171 (0.026)	0.247 (0.056)	0.231 (0.049)
N	143	143	143	143	143	143	143	143
R-squared	0.219	0.214	0.166	0.247	0.098	0.103	0.050	0.058

Table 9

Regressions on parent board characteristics post spinoff.

Inside directors are board members that are employees of the firm. Affiliated directors are board members that are related to an insider, are former employees, or have a substantive business relationship with the firm. All other directors are classified as outside directors and categorized by their primary experience. Outside expert denotes those directors with related industry or non-profit experience. Total experts are outside experts plus insiders. LN(TA) is the natural log of total book assets. M/B is the market value of equity plus the book value of assets minus the book value of equity, divided by the book value of assets. R&D is research and development expenses (recorded as 0 if missing in Compustat). OIBD is operating income before depreciation. P-values are listed in parentheses below the coefficient. Robust standard errors are used.

	Board size (9.1)	Board size (9.2)	% Outside (9.3)	% Outside (9.4)	% Parent expertise (9.5)	% Parent expertise (9.6)	Outside expert/ Total expert (9.7)	Outside expert/ Total expert (9.8)
Parent CEO was outside hire	-1.262 (0.019)		0.003 (0.936)		-0.040 (0.288)		-0.012 (0.864)	
CEO was internally promoted	-0.401 (0.320)		0.011 (0.672)		0.021 (0.498)		0.045 (0.430)	
Parent CEO _{t+1} was <i>not</i> on prior board		-0.955 (0.009)		0.022 (0.355)		-0.005 (0.869)		0.018 (0.731)
LN(TA)	0.719 (0.000)	0.711 (0.000)	0.020 (0.000)	0.020 (0.000)	-0.019 (0.002)	-0.019 (0.003)	-0.006 (0.623)	-0.005 (0.645)
M/B	0.418 (0.053)	0.398 (0.061)	0.003 (0.795)	0.002 (0.809)	-0.013 (0.478)	-0.015 (0.397)	-0.013 (0.607)	-0.017 (0.517)
RD/TA	-10.171 (0.026)	-9.555 (0.026)	0.272 (0.229)	0.266 (0.217)	1.707 (0.000)	1.762 (0.000)	2.514 (0.000)	2.584 (0.000)
OIBD/TA	-0.906 (0.646)	-0.891 (0.661)	0.012 (0.885)	0.009 (0.902)	0.128 (0.397)	0.136 (0.408)	0.192 (0.477)	0.207 (0.464)
Constant	3.800 (0.000)	3.891 (0.000)	0.582 (0.000)	0.576 (0.000)	0.259 (0.000)	0.262 (0.000)	0.290 (0.008)	0.296 (0.007)
N	143	143	143	143	143	143	143	143
R-squared	0.384	0.386	0.091	0.096	0.283	0.273	0.164	0.160

Appendix

Table A.1

Univariate statistics of unit and match firms.

Mean statistics are reported in the first row and medians are reported in the second. M/B is the market value of equity plus the book value of assets minus the book value of equity, divided by the book value of assets. R&D is research and development expenses (recorded as 0 if missing in Compustat). TA is total book assets. CX is capital expenditures. OIBD is operating income before depreciation. FCF is free cash flow defined as net income plus depreciation minus capital expenditures. D is long term debt plus the short term portion of long term debt. PPE is net plant, property and equipment. Herfindahl is calculated using industry sales at the four-digit SIC level. All variables for the unit are measured as of the first fiscal year following the spinoff. Two-population, two-tailed T-tests (Z-Score for Wilcoxon sign-rank tests) are used to compare means (medians) for differences between the pre-spinoff parent, the post-spinoff parent, and the unit. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

	Unit	Match	T-Statistic/ Z-Score
M/B	1.910 1.508*	2.057 1.549	-0.837 -1.878
R&D/TA	0.050 0.005*	0.045 0.000	0.730 1.706
CX/TA	0.059 0.042	0.064 0.035	-0.506 0.847
OIBD/TA	0.088 0.122	0.093 0.117	-0.299 0.623
FCF/TA	-0.065 0.024	-0.044 0.025	-0.693 -0.764
D/TA	0.226*** 0.183***	0.296 0.247	-2.757 -3.266
TA (millions)	4,807 610	5,427 594	-1.190 1.042
PPE/TA	0.290 0.199	0.278 0.210	0.694 1.261
Herfindahl	0.186 0.140	0.198 0.155	-0.862 -0.559