Management Turnover

in Subsidiaries of Conglomerates Versus Stand-alone Firms

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Abstract: We compare turnover of subsidiary managers inside conglomerate firms to turnover of CEOs of comparable stand-alone firms. We find that, compared to turnover of CEOs, subsidiary manager turnover is significantly more sensitive to changes in performance and significantly more likely following poor performance. For subsidiary managers, we also find that the relationship between turnover and performance is significantly stronger when the subsidiary operates in an industry that is related to the parent's primary industry. Results suggest that boards of directors are relatively ineffective disciplinarians of CEOs, and that, despite their other apparent failings, conglomerate firms have relatively strict disciplining mechanisms for subsidiary managers.

1.   Introduction

In 1969, Armen Alchian posited that replacement of an inefficient division head would be "quicker" within a conglomerate firm than if the division were a stand-alone firm, because headquarters executives "are specialists … who are rewarded more fully for collecting and evaluating information about people" (p. 349).[1] He ended his discussion of the issue with "But what the truth is, I do not know." Despite the large volume of research on organizational structure, both theoretically and empirically, that has been conducted in the past thirty years, we still have limited knowledge of how monitoring and disciplining of subsidiary managers within conglomerates differs from that of stand-alone firm CEOs. The only direct evidence is by Blackwell, et al. (1994), who report in a footnote that the turnover rate of top managers at subsidiary Texas banks is greater than that of CEOs at stand-alone Texas banks, but that the sensitivity of turnover to performance does not differ between the two groups of managers.[2] This paper presents a simple model that yields predictions that are consistent with Alchian's conjecture and reports empirical tests on matched samples of subsidiary managers and stand-alone firm CEOs. Our results indicate that turnover of subsidiary managers is significantly more likely following poor operating performance than is turnover of CEOs of comparable stand-alone firms.

To formalize our thinking about management turnover, we borrow a framework from the labor economics literature in which turnover occurs in response to poor performance (e.g., Jovanovic, 1979). The basis of the model is as follows: when managers are hired, neither the manager nor the principal knows the manager's ability with certainty. The principal uses ex post performance to revise expectations about the manager's ability, and fires the manager if the principal's expected benefits of taking another draw from the pool of managers exceeds the principal's costs of replacement. We assume that the principal incurs private replacement costs that are not incurred by the firm's owners and consequently, that incentives for the principal are not perfectly aligned with those of the firm's owners.

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[1] Similarly, Williamson (1981) states that "monitoring benefits are realized in the degree to which internal monitors enjoy advantage over external monitors in access to information" (p. 1559).
[2] There is related literature focused on the workings of internal labor markets, but it does not compare the internal market for top managers to the market for CEOs (e.g., Baker, et al., 1994).

The model predicts that lower replacement costs, a greater sensitivity of the principal's wealth to firm performance, and better information about the performance generating process increase the likelihood of turnover following poor performance. We then relate these results to subsidiaries and stand-alone firms, where headquarters executives are the principals of subsidiary managers and boards of directors are the principals of CEOs. We argue that (1) the costs of replacing a subsidiary manager are generally lower than the costs of replacing a CEO, (2) headquarters executives' compensation, and therefore their wealth, generally is more sensitive to firm performance than that of boards of directors, and (3) headquarters executives are likely to have better information about the performance generating process than do boards of directors. These arguments lead to the prediction that the likelihood of turnover following poor performance will be greater for top managers of subsidiaries than for CEOs of stand-alone firms.

To test this prediction, we construct a sample of subsidiary managers and pair it with a sample of CEOs of stand-alone firms that have been matched on the basis of calendar time, size, and industry (SIC code). Matching helps to ensure that we compare business entities that are similar in terms of their asset structure, but differ in terms of their organizational structure. Using entity specific operating performance, our empirical results indicate that, after controlling for manager age, ownership structure, board structure, industry, stock price performance, and entity size, the likelihood of turnover following poor performance and the sensitivity of turnover to performance are significantly greater for top subsidiary managers than for CEOs of stand-alone firms. For example, when our operating performance measure drops from the median to the sample's 25th percentile and all other variables are at their medians, the predicted probability of turnover during that year and the subsequent two years increases from 0.34 to 0.51 for subsidiary managers versus 0.30 to 0.35 for stand-alone CEOs.

We also examine subsidiary manager turnover in isolation, focusing on characteristics of conglomerates that are predicted to influence turnover of subsidiary managers. For example, Gertner, et al. (1994) present a model in which the cost of redeploying assets is lower in related conglomerates. They predict that "business-unit managers inside related conglomerates will be more likely to be replaced …

following poor performance …than business-unit managers inside unrelated conglomerates" (p. 1228).

Consistent with this prediction, we find that, the likelihood of turnover following poor performance and

the sensitivity of turnover to performance are significantly greater when the subsidiary operates in an

industry that is related to the primary industry of the parent. For example, when our operating

performance measure drops from the median to the 25th percentile and other variables equal their sample

medians, the predicted probability of turnover increases from 0.27 to 0.57 for subsidiaries operating in the

same industry as the parent and from 0.27 to 0.39 for subsidiaries operating in unrelated industries.

Our analysis relates to several lines of inquiry in the literature. A large body of research focuses

on the effectiveness of the board of directors and the market for corporate control as mechanisms for

disciplining CEOs. For example, Weisbach (1988) considers whether the presence of outside board

members influences CEO turnover, while Goyal and Park (2002) analyze whether bestowing CEO and

chairman duties on one individual affects CEO turnover. Denis, et al. (1997), Franks, et al. (2001), and

Volpin (2002) examine how ownership structure influences CEO turnover. Mikkelson and Partch (1997)

and Denis and Kruse (2000) test whether a decline in takeover activity during the late 1980s affected

CEO turnover. These studies provide valuable information about factors affecting CEO turnover, but

they do not show how the disciplining of CEOs compares to that of managers operating under alternative

disciplining mechanisms.[3]

Several recent papers address turnover of executives operating under alternative disciplining

mechanisms. For example, Blackwell, et al. (1994) analyze turnover of subsidiary bank managers, Mian

(2001) examines turnover of CFOs, and Fee and Hadlock (2002) examine turnover of the four executives

immediately below the CEO. In each instance, these are executives who are likely to be disciplined by

higher level executives rather than the board of directors. These studies find that the overall turnover rate

of managers below the CEO level is greater than the turnover rate of CEOs, but, in contrast to one of our

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[3] Anderson, et al. (2000) and Berry, et al. (2000) examine whether CEO turnover differs between conglomerates and
single-segment firms. Although at first glance, these papers might seem similar to this study, the issues addressed
differ. By comparing CEO turnover in focused, stand-alone firms to subsidiary manager turnover in conglomerates,
we compare turnover of managers that have similar operating responsibilities, but work within different
organizational structures. Anderson, et al. and Berry, et al. compare turnover of managers in similar organizational
structures, but these managers differ in their operating responsibilities.

main results, they find that the sensitivity of turnover to performance is not greater for lower level executives.

The difference in results regarding the sensitivity of turnover to performance is most likely due to the performance measures employed and the types of managers being compared. With the exception of Blackwell, et al. (1994), the existing literature examines managers with different operating responsibilities and employs firm level performance measures that are likely to be differentially informative about CEO and lower level executive quality.[4] In contrast, we compare managers with similar operating responsibilities and, by using *Compustat* segment data, we construct a subsidiary-level operating performance measure that arguably is as informative about subsidiary manager quality as is firm-level operating performance about CEO quality.

To the extent that we have performance measures that are equally informative about subsidiary manager and CEO quality, the significantly greater sensitivity of turnover to poor performance for subsidiary managers reflects differences in the respective disciplining mechanisms. Our evidence on the disciplining of CEOs versus subsidiary managers, therefore, provides new evidence about the costs and benefits of organizing business units within a conglomerate structure versus as stand-alone firms. Existing research suggests that this type of organizational design decision depends on which organizational form allocates capital more efficiently (e.g. Gertner, et al. (1994), Scharfstein and Stein (2000), Rajan, et al. (2000), Wulf (2000), Matsusaka and Nanda (2002)), improves the ability of the market to value the firm (e.g. Habib, et al. (1997), Krishnaswami and Subramanian (1999), Gilson, et al. (2001)), and provides the greatest incentives for managers to increase value (Schipper and Smith (1986), Holmstrom and Tirole (1993)). In general, these papers suggest that a stand-alone structure is more efficient. Our evidence, however, suggests that a conglomerate structure has a stricter disciplining mechanism, which, at least partly, offsets the other potential advantages of a stand-alone structure.

The paper proceeds as follows. In the next section, we present a simple model to motivate why the sensitivity of turnover to performance might differ between subsidiaries and stand-alone firms. In

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[4] Blackwell, et al. (1994) primarily test whether subsidiary level or parent level performance has greater influence on subsidiary bank manager turnover. In addition they look for evidence of relative performance evaluation.

section 3, we describe the sample and report descriptive statistics. The empirical results comparing

turnover in subsidiaries versus stand-alone firms are presented in section 4. The analysis of subsidiary

manager turnover is presented in section 5, and the paper concludes with a short summary.

2. Management Turnover Model

The responsibilities of a principal in a principal-agent relationship are multi-dimensional.

Whether it is a board of directors disciplining a CEO or headquarters executives disciplining a subsidiary

manager, the principal must decide how much information to gather about the agent's performance,

process the information, and then decide whether to take disciplinary action. To better understand why

turnover of top subsidiary managers might differ from that of CEOs of stand-alone firms, we develop a

simple model to identify general characteristics of the disciplining mechanism that influence the

likelihood of turnover.[5] We then compare subsidiaries and stand-alone firms with respect to these

characteristics.

2.1 Factors Affecting Turnover

At the beginning of the first period, managers are hired, but neither the manager nor the principal

knows the manager's true quality, θ. Everyone, however, knows that θ is drawn from a normal

distribution with mean μ and standard deviation σ_θ. For simplicity, we assume that θ is in monetary

units. The manager works for the first period and generates an observable performance metric y, which

equals $\theta + \varepsilon$, where ε is a random factor that is normally distributed with mean zero and standard

deviation σ_ε. Since y depends on θ, y provides information about the manager's quality. The greater the

standard deviation, σ_ε, the less informative y is about the manager's quality. After observing y, the

principal uses Bayes' Rule to calculate a revised expected value for θ. The principal's expectation of the

manager's quality after observing first period performance is a weighted average of the prior expected

quality, μ, and the observed performance value, y, where the weights are the inverses of the respective

variances, i.e., the precisions (Box and Tiao, 1973):

$$E(\theta \mid y) = \frac{\left(y\sigma_\varepsilon^{-2} + \mu\sigma_\theta^{-2}\right)}{\left(\sigma_\varepsilon^{-2} + \sigma_\theta^{-2}\right)}.\qquad\qquad(1)$$

After updating expectations about managerial quality, the principal has the option of replacing the existing manager with a new draw from the managerial labor pool at a cost to the firm of C. In addition, the principal incurs a private cost equal to C_P if the principal replaces the manager. Since C_P is borne fully by the principal, while C is shared with other owners, the private cost can lead to a divergence between the turnover decision made by the principal and the turnover decision that would be optimal for shareholders.

Performance in the second period is generated by the same process as in the first period ($y = \theta + \varepsilon$), except that there is a new realization for ε and the manager's quality can differ if the first period manager is replaced. We assume that the principal is risk neutral, there is no discounting, and the principal's wealth is proportional to the firm's performance, where the proportionality factor is α. We also assume that the firm ceases to exist after the second period, although in our discussion of the results, we consider the implications of additional periods.

The expected second period payoff to the principal if the existing manager is replaced equals $\alpha(\mu - C) - C_P$, and the expected payoff if the existing manager is retained equals $\alpha E(\theta \mid y)$. Thus, to maximize expected wealth, the principal replaces the existing manager if $\alpha E(\theta \mid y) < \alpha(\mu - C) - C_P$. By substituting equation (1), we find that replacement occurs when

$$y < \mu - \left(C + \frac{C_P}{\alpha}\right)\left(\frac{\sigma_\varepsilon^{-2} + \sigma_\theta^{-2}}{\sigma_\varepsilon^{-2}}\right) \equiv y*.\qquad\qquad(2)$$

Condition (2) states that replacement occurs when performance, y, falls below some minimum required performance level, y^*.

Several points are worth noting about the turnover condition. First, y^* is less than the output that would be expected from a new manager (μ). Intuitively, principals are willing to keep an existing manager with below average expected performance because replacement is costly. Second, the greater

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[5] The structure of the model is similar to models used in a number of earlier papers, including Jovanovic (1979),

the replacement costs, the more lenient the performance criteria, all else equal. Third, as incentives for the principal become more closely aligned with the objective of maximizing firm value (as α increases), personal replacement costs (C_p) become less important and the performance criteria becomes more stringent.

Also note that as the noise in the performance generating process, σ_ε, increases, the minimum required performance, y^*, decreases. Intuitively, as σ_ε increases, y becomes less informative about the manager's quality, and so principals give managers more leeway. This point highlights the importance of using a performance metric in the empirical analysis that is equally informative about manager quality when comparing the disciplining mechanisms for different types of managers.

As researchers, we cannot observe each organization's required performance level, y^*. Nevertheless, if we assume that y^* varies systematically across organization type (stand-alone versus subsidiary), then the organization type that has a higher average value of y^* will exhibit a higher probability of turnover conditional on poor performance (Appendix A provides expositional details). Moreover, provided performance is not so low that the probability of turnover is extremely high for both types, the organization type that has a higher average value of y^* will exhibit a greater sensitivity of turnover to performance, i.e., the likelihood (not the odds) of turnover will increase by a greater amount when performance declines. In the following subsections, we argue that the underlying parameters determining the minimum performance level, y^*, cause subsidiaries to have higher values of y^*, on average, than stand-alone firms. Consequently, the probability of turnover conditional on poor performance and the sensitivity of turnover to performance will likely be greater for subsidiary managers than for CEOs of stand-alone firms.

2.2   Differences Between Subsidiaries and Stand-alone Entities

2.2.1   Replacement Costs (C)

The replacement costs incurred by the firm (C) are likely to be higher when the CEO of a stand-alone firm is replaced than when a subsidiary manager is replaced, in part, because the skill set needed to

McKenna (1986), and Murphy (1986).

be a CEO differs from that of a subsidiary manager. Wruck and Wruck (2002) argue that top managers of publicly traded companies need corporate governance skills that subsidiary managers do not need. The pool of suitable replacement CEOs, therefore, is likely to be smaller than the pool of suitable replacement subsidiary managers. This implies that the cost of finding and attracting a suitable replacement is likely to be greater for CEOs of stand-alone firms than for subsidiary managers. Even holding the size of the pool of potential replacements constant, replacement costs incurred when headquarters executives are working to identify a suitable replacement manager are likely to be less than when a board of directors is engaged in the same task. This is because headquarters executives are involved in day-to-day operations and are therefore more likely to be familiar with the internal pool of potential successors.

Severance payments (golden parachutes) provide another reason why replacement costs are likely to be higher for CEOs of stand-alone firms. One role of severance payments is to help reduce manager resistance to value-increasing merger or takeover offers (Jensen (1988), Harris (1990), Lafanowicz, et al. (2000)). Since subsidiary managers are less involved in corporate control issues, their severance packages are likely to be lower than those for CEOs of stand-alone firms. Higher replacement costs for CEOs of stand-alone firms will lower the minimum required performance level and thereby decrease the likelihood of CEO turnover following poor performance.

2.2.2 Private Replacement Costs (C_P)

Principals can incur costs when they replace a manager, which are not shared with equityholders. We posit that these private replacement costs generally are higher for a board of directors considering replacing a CEO than for headquarters executives considering replacing a subsidiary manager. One reason is that board members are more likely to have personal or business relations with a CEO, which will be disrupted if the manager is replaced. Hallock (1997), for example, provides evidence of nepotism in the composition of boards. Also, inside board members are more likely to lose their positions with the firm if the CEO is replaced (Fee and Hadlock, 2002). In contrast, headquarters executives typically can fire a subsidiary manager without being concerned about losing their own positions.

Additional private costs arise from the possibility that an attempt to replace a manager will be unsuccessful. For parsimony, we have not modeled the possibility of unsuccessful replacement attempts, but the implications are straightforward. In contrast to headquarters executives, who are likely to have complete authority to remove a subsidiary manager, a critical mass of directors is required to remove a CEO. Obtaining critical mass will often be difficult since the CEO, as well as several individuals hand-picked by the CEO, will generally be directors. Thus, greater effort (i.e., greater cost) is likely to be required to remove a CEO. Moreover, there is always the possibility that a coup d'etat by the board will fail, resulting in retribution. These effects reduce the minimum required level of performance for CEOs relative to subsidiary managers, providing another reason that the probability of turnover following poor performance will be greater for subsidiary managers than for stand-alone firm CEOs.

2.2.3 Sensitivity of the Principal's Wealth to Performance

Compensation for headquarters executives typically is more closely tied to firm value than is compensation for the board. Hall and Liebman (1998), for example, find that the median sensitivity of one year's worth of incentive pay for a CEO is $5.29 per $1,000 of additional shareholder value. In contrast, Perry (1999) finds that the outside board members have a median value for their combined wealth sensitivity of one year's worth of incentive pay equal to $0.24 per $1,000 of additional shareholder value (also see Harford (2002) for evidence on directors' incentives). In addition, the value of human capital for headquarters executives is likely to be more sensitive to the firm's performance than that of outside board members. Brickley, et al. (1999) find that post-retirement opportunities for CEOs are related to performance, suggesting that even the human capital of executives close to retirement depends on firm performance. Consequently, α is likely to be greater for headquarters executives than for boards of directors, implying that the minimum required performance level for top subsidiary managers is likely to be greater than that for CEOs of stand-alone firms.

2.2.4 Information about the Performance Generating Process

Since headquarters executives are involved in the firm's daily operations, they are likely to have more information about random factors influencing performance as well as greater expertise in

interpreting information about performance (Alchian (1969) and Williamson (1981)). Also, headquarters executives are likely to have more information than the board of directors for reasons already discussed, i.e., board members' incentives to become informed will be reduced if, ultimately, they will be less willing to replace a poorly performing manager, and if they receive a lower share of the returns from gathering information than do headquarters executives.

One way to model the better information of headquarters executives is to assume that the noise in the performance generating process is composed of two independent and normally distributed noise terms, i.e., $\varepsilon = \varepsilon_1 + \varepsilon_2$, and that headquarters executives are able to filter out the second noise term, but boards of directors cannot. Under these assumptions, headquarters' updated expectation of manager quality is given by equation (1) except that unfiltered performance (y) is replaced by filtered performance ($\hat{y} = y - \varepsilon_2$) and the precision of the unfiltered performance (σ_ε^{-2}) is replaced by the greater precision of the filtered performance ($\sigma_{\varepsilon 1}^{-2}$). The greater precision of the filtered performance measure implies that the minimum required level of filtered performance for subsidiary managers is greater than the minimum required level of unfiltered performance for stand-alone CEOs.[6] That is, the performance criteria will be stricter for subsidiary managers.

If the filtered noise term (ε_2) has mean zero, then, on average, turnover of subsidiary managers will occur at higher levels of unfiltered performance than will turnover of stand-alone managers. The difference between filtered and unfiltered performance, however, will add noise to the relationship between turnover and unfiltered performance. This effect biases against finding evidence of the hypothesized information advantage of headquarters executives when examining the relationship between management turnover and unfiltered performance.

2.3   Model with Multiple Signals

The empirical literature shows that the likelihood of CEO turnover increases as accounting-based operating performance decreases and as stock price performance decreases. Conceptual arguments also support the use of both types of metrics when assessing the performance of a CEO of a stand-alone firm.

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[6] This is a straightforward extension to equation 2. Details are available from the authors on request.

For example, Hermalin and Weisbach (1998) argue that accounting performance measures are likely to be more informative about existing CEO quality, because stock prices reflect future expected performance, including the effects of anticipated CEO turnover. Also, Brickley, et al. (1999) argue that superior accounting returns can indicate superior CEO ability, because some of the rents generated by a CEO with superior ability are shared with the firm if the CEO's skills are firm specific and because some compensation costs, such as options granted, are not reported as an expense. On the other hand, stock returns are more timely, not as easily manipulated as accounting performance measures, and reflect management actions that impact operating earnings some time in the future.

Arguments also exist to support both types of metrics when assessing a subsidiary manager's performance. An advantage of accounting based operating performance is that it depends primarily on the performance of the subsidiary that the manager is overseeing, whereas stock price performance measures depend on the entire firm's performance. Consistent with this argument, Keating (1997) reports survey evidence that division level accounting metrics are used more often to assess division managers than firm level metrics. Still, stock price performance measures can be informative about subsidiary managers' performance when there are interdependencies across subsidiaries (Bushman, et al., 1995).

Extending the model to include two independent performance signals is straightforward. Let $y_1 = \theta + \varepsilon$, $\varepsilon \sim N\left(0, \sigma_\varepsilon^2\right)$ and $y_2 = \theta + \eta$, $\eta \sim N\left(0, \sigma_\eta^2\right)$ represent two performance measures. If the error terms (ε, η) are uncorrelated, the combination of signals for which it is optimal for the principal to replace the manager and take another draw from the pool of managers satisfies the following expression:

$$y_1 \frac{\sigma_\varepsilon^{-2}}{\left(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2}\right)} + y_2 \frac{\sigma_\eta^{-2}}{\left(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2}\right)} < \mu - (C + \frac{C_p}{\alpha}) \frac{\left(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2} + \sigma_\theta^{-2}\right)}{\left(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2}\right)}. \qquad (3)$$

The left-hand side is a weighted average of the two signals where the weights are the relative precisions, and the right hand side is analogous to the minimum required performance level (y^*) from expression (2). Expression (3) implies that turnover occurs when the weighted average of the performance signals is sufficiently below the expected performance of a replacement manager.

Having two informative signals changes the turnover condition in two ways. First, both signals need to be considered, with the weight given to each signal determined by the signal's relative precision. Second, as the overall precision of the combined signals, $(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2})$, increases, the minimum required performance level (the right hand side of expression (3)) increases. These results can be applied to multiple signals received in a single period (e.g., operating performance and stock price performance in a given year) or to sequential signals received over multiple periods. The latter interpretation has the additional implication that a manager's tenure would impact the turnover condition, because as tenure increases, the number of relevant performance signals increases and the overall precision of the combined signals increases (Kim, 1996).

2.5   Summary

The turnover model presented above and the subsequent discussion provide the main motivation for our empirical analysis, where we examine whether the relationship between turnover and performance for top subsidiary managers differs from that for CEOs of stand-alone firms. Additional motivation for our analysis comes directly from Gertner, et al. (1994). Although their model is concerned with the allocation of capital, they state that, since conglomerates can more easily redistribute assets between related subsidiaries, "business-unit managers inside related conglomerates will be more likely to be replaced … following poor performance than either (1) top managers of comparable stand-alone firms or (2) business-unit managers inside unrelated conglomerates (p. 1228)." The latter prediction, along with the dearth of evidence on subsidiary manager turnover, motivates our separate analysis of subsidiary manager turnover in section 5.

3.   Data

Our analysis requires two types of business entities: (1) subsidiaries of conglomerates and (2) comparable focused, stand-alone firms. Because of the significant hand-collecting of data, we only examine firms after 1987. This greatly increases the likelihood of obtaining information from electronic sources such as Lexis-Nexis. We construct the samples to ensure cross-sectional variation in performance

within each group, but we attempt to match based on calendar time, size, and industry, which helps to control for many other factors influencing turnover, such as activity in the external market for corporate control (Hadlock and Lumer (1997) and Mikkelson and Partch (1997)) and the homogeneity/competitiveness of the industry (Parrino (1997), Defond and Park (1999)).

Although we ultimately use both accounting operating performance and stock price performance in the empirical analysis, we select samples to ensure cross-sectional variation in accounting operating performance. The reason is that accounting operating performance measures can be constructed for both focused, stand-alone firms and subsidiaries that are likely to be equally informative about the abilities of the respective managers. In contrast, for subsidiary managers, stock price performance also reflects the abilities of headquarters executives and of sister subsidiary managers.

3.1   Subsidiary/Segment Selection

Since information about subsidiaries is the most costly to obtain and to ensure an adequate number of turnover events, we begin by identifying segments of conglomerate firms that have experienced a significant decline in operating performance relative to their industry. A firm is classified as a conglomerate firm if less than 90 percent of its sales are in one segment. We use operating performance relative to the industry in order to identify performance declines that might be attributable to managers rather than to industry-wide downturns. Operating performance is measured using the ratio of earnings before interest, taxes, and depreciation to total assets (EBITD/TA) for a segment relative to the median value of EBITD/TA for the industry, using two- or three-digit SIC codes to define industry. Using this performance metric, we identify 808 segments that have above median performance in one year followed the next year by performance in the bottom quartile during the period 1987 - 1998. Denis and Kruse (2000) use a similar screening process applied at the firm level.

We then try to identify the manager of these segments using the annual *Directory of Corporate Affiliations*, as well as 10Ks and corporate proxy statements. Identifying managers is difficult because the organizational structure of the firm often does not match reported segment data and because many firms report little information about lower level managers. For example, many firms combine multiple

divisions/subsidiaries into one segment for accounting purposes. If a segment cannot be matched to a manager that we can track over our turnover period, then the segment is discarded. This search process results in a sample of 101 segments with identifiable managers.[7] We refer to these observations as poor-performance subsidiaries and the year of poor performance as the base year.

To ensure cross-sectional variation in performance in our subsidiary sample, for each of the poor-performance subsidiaries, we select a matched segment (based on calendar time, size, and industry) that has good performance. Specifically, we identify all segments with operating performance above the industry median for both the base year –1 and the base year , asset value within 25 percent of the poor performance subsidiary's asset value, and the same two-digit SIC code as the poor-performance subsidiary. We then select the segment that is closest in size to the poor performance subsidiary for which a manager can be identified and tracked over our turnover period. If no segment satisfies the size and industry restrictions or a manager cannot be identified, we search for potential matches with identifiable managers having the same one-digit SIC code and asset value within 25 percent of the poor-performance subsidiary. If we still lack a match, we select the segment with an identifiable manager that is closest in size regardless of industry. Combining these good-performance subsidiaries with the poor-performance subsidiaries, we have 202 subsidiaries with identifiable managers.

3.2   Stand-alone Firm Selection

To complete the data set, we select two focused, stand-alone firms that match the poor-performance subsidiaries with respect to size and industry affiliation during the base year.[8] One stand-alone firm has a decline in industry-adjusted operating performance from above the median to the lowest quartile between the base year –1 and the base year. The other stand-alone firm has industry-adjusted performance above the median in both the base year –1 and the base year. The same size and industry restrictions used in selecting good-performance subsidiaries are again applied.

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[7] The 101 segments are, on average, larger and are part of larger firms than the 707 segments for which we cannot identify managers. Since we control for size in both our matching process and our regression analysis, exclusion of smaller subsidiaries is unlikely to explain differences in the turnover – performance relationship between subsidiary managers and CEOs. Although we cannot test whether our results would generalize to smaller entities, we have no reason to suggest that they would not.

This process gives a total sample of 404 entities; one-half are subsidiaries and one-half are focused, stand-alone firms. Within each of these categories, one-half had relatively poor performance in the base year and one-half had relatively good performance. One subsidiary appears in the sample twice (eight years separate the base years of the observations). Otherwise, no stand-alone firm or subsidiary is used more than once, however, a few parents have multiple subsidiaries in the sample. Note that the sample omits entities that had modestly poor operating performance in the base year. As a consequence, the overall frequency of turnover is likely to exceed that observed in a more general sample, but we do not expect that this will bias our results.[9]

3.3   Determination of Turnover

For each observation, management turnover during a three-year period beginning in the base year is determined by examining the *Directory of Corporate Affiliations*, annual reports, 10Ks, proxy statements, and news reports. Warner, et al. (1988) note that the lag between poor performance and turnover can be up to two years. Because of this slow reaction, some studies of CEO turnover use pooled or panel data, often with lagged variables, covering a multi-year time frame for each firm. Due to the cost of constructing panel data for subsidiaries, we elect to follow the approach of Denis and Kruse (2000) and focus on the base year's performance for each firm and track turnover over a three-year period. Mikkelson and Partch (1997) track turnover over a similar multi-year period.

For the empirical analysis, subsidiary managers who obtain internal promotions or move laterally are not classified as having turned over. In a couple of instances, a subsidiary or stand-alone firm was acquired, and the manager was not employed following the acquisition by either the original parent or the acquirer. We classify these managers as having turned over.

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[8] A focused, stand-alone firm is defined as a U.S. based firm with at least 95 percent of its sales coming from a single segment.
[9] We confirmed this statement using a simulation experiment. In particular, we parameterized the model from the previous section and used Monte Carlo simulation to generate data on performance, which in turn yielded data on turnover. We then estimated logit regression models similar to those in the empirical analysis with all the simulated observations and then again omitting the middle two performance quartiles. The results of repeated iterations of this experiment indicate that the coefficients on the performance variables are not changed, on average, when the observations of the middle quartiles are omitted, but that the statistical significance increases. Thus, our selection process is unlikely to introduce bias in the coefficients, but it may lead to an increase in power for the statistical tests.

3.4   Other Data

We identify the age of the manager during the base year using a variety of sources, including proxy statements, internet searches, and in a few instances direct contact. Since prior studies have shown that corporate board composition, insider share holdings, CEO ownership, and whether the CEO concurrently is the Chairman of the Board are associated with CEO turnover, we gather these data from proxy statements in the base year -1 for each subsidiary's parent and each stand-alone firm. *Compustat* data are used to obtain information on asset size and operating performance (previously defined). Finally, CRSP data are used to calculate the return for the common stock of the stand-alone firms and the parents of the subsidiaries over the base year.   CRSP data are also used to calculate equal weighted industry returns and market returns.

3.5   Summary Statistics

Panel A of Table 1 presents the distribution of base years. Since the base year for the poor-performance subsidiaries is used as a matching criteria for the selection of the other three entity categories, the distributions of base years is the same for each of the four categories of entities. The base years are relatively uniformly distributed from 1987 to 1998.

In selecting matches, we look for entities (poor performance stand-alones, good performance stand-alones, and good performance subsidiaries) that match each poor performance subsidiary with respect to calendar time, asset size, and industry affiliation, in that order of priority. Not surprisingly, therefore, we are not entirely successful in matching based on industry, especially for the poor performance stand-alone firms for which there are fewer entities from which to choose. Only 44 of 101 poor performance stand-alone firms selected have the same 1-digit SIC code as their matching poor performance subsidiary. In contrast, 85 of the good performance subsidiaries and 98 of the good performance stand-alones have the same 1-digit SIC code as their matching poor performance subsidiary.

The lack of industry matching on a case-by-case basis, however, does not necessarily imply that the distribution of industries represented in the sample differs materially across the types of entities. This is because mismatches can cancel. For example, a stand-alone firm from SIC code 28 might be matched

to a subsidiary from SIC code 35 and a stand-alone firm from SIC code 35 might be matched to a subsidiary from SIC code 28. To examine the distribution of industry representation across the different types of entities, we present in Panel B of Table 1 the frequency distribution of two-digit SIC codes for each of the four sub-samples for those industries having at least four poor performance subsidiaries. For many (but admittedly not all) of the industries, there is a similar number of entities across the different types of entities. To allay any remaining concerns about the different industry representation for the different entity types, our later analysis controls for industry characteristics that have been shown to be related to turnover (Parrino (1997) and Defond and Park (1999)).

Table 2 presents descriptive statistics for the variables used in the analysis for each of the four subsamples. Additionally, we report p-values for t-tests and rank-sum tests that test whether the mean and median of a variable differ between the subsidiary and stand-alone sub-samples by performance type. The first row compares total assets for the subsidiaries (not the subsidiary parent) to total assets for the stand-alone firms. Consistent with our matching process, the subsidiaries and stand-alone firms are of similar size, on average.

The next three rows of Table 2 present descriptive statistics on industry adjusted operating performance, measured using earnings before interest, taxes, and depreciation divided by total assets (EBITD/TA) minus the median industry value of EBITD/TA.[10] To moderate the impact of outliers, industry-adjusted values of EBITD/TA are winsorized at –0.5 and 0.5. This adjustment, however, does not materially affect the results in this or later tables.[11] Recall that we require all of the entities in the sample to have operating performance above the industry median in the year prior to the base year. This requirement, however, is not sufficiently restrictive to prevent subsidiaries and stand-alone firms from having different average values of base year -1 industry adjusted operating performance. Specifically, the poor (good)

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[10] The industry is defined as focused firms that, according to *Compustat* segment data, had at least 95 percent of their sales in that year in one three digit SIC code. If fewer than five firms are available at the three-digit level, then the industry is redefined to be focused firms at the two-digit level. We also calculated industry adjusted performance using the firm's primary SIC code to define industry and the results are not changed. See Kahle and Walkling (1996) for an analysis of how industry classifications can matter in financial research.

[11] Eliminating one observation that has high influence statistics has the same impact as winsorizing. This observation has a –100 percent value for EBITD/TA in the base year (-$12 million in operating earnings on assets of

performance subsidiaries have better performance on average than the poor (good) performance stand-alone firms in base year -1. A similar relationship exists for base year industry adjusted operating performance. This persistent difference in the industry adjusted operating performance suggests that there might be a systematic difference in the way in which subsidiary and stand-alone operating performance are measured. If, for example, conglomerate firms do not allocate "overhead assets" to specific segments, then the return on assets for subsidiaries will, on average, be higher in absolute terms than that for stand-alones, even if actual performance is the same. Taking differences over time, however, should reduce the impact of such errors, if they exist. Table 2 indicates that there is no statistical difference between subsidiaries and stand-alones in industry adjusted changes in operating performance (ΔEBITD/TA$_{adj}$). Therefore, our empirical analysis focuses on industry adjusted changes in operating performance, although as we discuss later, our results are robust to other performance measures.

Base year stock price performance is measured using CAR_IND, defined as the cumulative stock return in excess of an equal weighted industry return for the base year. Note that due to missing CRSP data, we are unable to calculate CAR_IND for fourteen observations: two good performance subsidiaries, three poor performance subsidiaries, four good performance standalones, and five poor performance standalones. CAR_IND for poor (good) performance subsidiaries is not significantly different than for poor (good) performance stand-alone firms. The correlation coefficients between ΔEBITD/TA$_{adj}$ and CAR_IND are relatively low and do not differ materially between subsidiaries and stand-alone firms (0.116 for subsidiaries and 0.098 for stand-alone firms). The low correlation suggests that the two performance measures reflect different information.

Subsidiary parents have significantly lower mean and median values of CEO ownership and director and executive ownership than do stand-alone firms. Also, subsidiary parents have significantly more directors than the stand-alone firms. Some of the difference is due to the greater average size of subsidiary parents relative to stand-alone firms (on average, the subsidiary's assets are about 30 percent of the parent

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$12 million), but did not experience turnover. Lexis-Nexis newswire reports indicate that the segment took a before-tax write-down of $10 million in the base year.

firm's total assets). After controlling for size, however, there are still significant differences in stock ownership and directors between subsidiary parents and stand-alone firms.

The ownership of outside blockholders is about the same for subsidiary parents and stand-alone firms. The proportion of outsiders on the board, however, is significantly greater, on average, in the subsidiary parents. Across the two organizational forms, minimal differences are observed in the proportion of firms where the CEO is also Chairman of the Board. Finally, the age of the poor performance subsidiary managers does not, on average, differ from the poor performance stand-alones, but the age of the good performance subsidiary managers is approximately four years less than that of good performance stand-alone CEOs.

4.   Relationship between Turnover and Performance

4.1   Univariate Results

Table 3 presents the turnover rates for the four classes of business entities in our sample. The average annual CEO turnover rate is 12 percent, which is consistent with annual turnover rates of between 5 and 15 percent documented in most prior studies (e.g., Coughlan and Schmidt (1985), Warner, et al. (1988), Weisbach (1988), Denis, et al. (1997), Mikkelson and Partch (1997), Bhagat, et al. (1999), and Denis and Kruse (2000)). Also, consistent with other studies, the turnover rate is related to performance. Poor-performance entities (both subsidiaries and stand-alone firms) have a significantly higher turnover rate than good-performance entities.

The turnover rates in Table 3 provide preliminary evidence consistent with the hypothesis that turnover of top managers in subsidiaries is more likely following poor performance than is turnover of CEOs of stand-alone firms. The 62.4 percent turnover rate for poor-performance subsidiaries is significantly greater than the 45.5 percent turnover rate for poor-performance stand-alone firms. For good-performance entities, however, the difference between the 18.8 percent turnover rate for subsidiaries and the 26.7 percent turnover rate for stand-alone firms is not statistically significant.

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4.2 Logit Regression Results

To control for other factors affecting management turnover, we estimate logit regression models where the dependent variable equals one if there is turnover and zero otherwise. The explanatory variables of primary interest are the performance measures, an indicator variable, SUBSID, which equals one if the entity is a subsidiary and zero if it is a stand-alone firm, and the performance measures interacted with SUBSID. Since prior studies have found a strong correlation between turnover and manager age (e.g., Weisbach (1988), Murphy and Zimmerman (1993), Goyal and Park (2002)), we include a dichotomous variable (AGE>62), indicating whether manager age is greater than 62, as a control. Prior research also has found that turnover is more likely in larger firms (e.g., Denis, et al. (1997), Warner, et al. (1988)), so we include the natural logarithm of assets (LOG_ASSETS).

The first column of Table 4 presents results using the change in industry adjusted operating performance in the base year (ΔEBITD/TA$_{adj}$) as the sole performance measure. The estimated coefficient on the performance variable is negative and statistically significant, indicating that the likelihood of turnover for stand-alone firms increases as operating performance in the base year declines. The coefficient on the variable that interacts performance with SUBSID also is negative and statistically significant, indicating a stronger relationship between turnover and performance for subsidiaries than for stand-alone firms. The coefficient on the SUBSID variable is not statistically significant. The estimated coefficients for AGE>62 and LOG_ASSETS are positive and statistically significant, consistent with other studies.

As discussed earlier, stock price performance is also likely to be informative about manager quality. The two-signal model implies that both accounting and stock price performance will be used to evaluate managers. Moreover, the weight given to each performance metric will depend on the metric's relative precision (see equation 3). A potential explanation for the result in Column 1 of Table 4 is that stock returns are omitted from the model. If the relative precision of stock returns is greater than that of operating performance for CEOs, but the reverse is true for subsidiary managers, then the relationship between turnover and operating performance would be stronger for subsidiary managers than for CEOs ,

while the relationship between turnover and stock returns would be stronger for CEOs than for subsidiary managers.[12]

Column 2 of Table 4 reports the results when we include the industry adjusted stock performance measure (CAR_IND), along with its interaction with SUBSID. The coefficients on the stock return variable and on the operating performance variable are both negative and statistically significant. Thus, both poor accounting performance and poor stock returns are associated with an increased probability of CEO turnover. As with the results in Column 1, the coefficient on the variable that interacts the accounting performance measure with SUBSID is negative and statistically significant, thus indicating that the relationship between poor accounting performance and turnover is stronger for subsidiary managers. The coefficient on the variable that interacts stock price performance with SUBSID, however, is not significantly different from zero, indicating no difference in the strength of the relationship between stock returns and turnover for CEOs versus subsidiary managers. These results suggest that differences in the relationship of turnover to operating performance are not due to the absence of a stock price performance measure in the equation.

For completeness, we report in column 3 of Table 4 the results if we omit the operating performance variables from the model. As in the previous results, the coefficient on the stock price variable is negative and statistically significant, but the coefficient on the interaction of stock price performance with SUBSID is not statistically significant. These results further support the conclusion that firm stock price performance does not influence turnover of subsidiary managers differently than turnover of stand-alone CEOs.

To illustrate the economic significance of the estimated models, we report in Table 5 the predicted probability of turnover for the 10th, 25th, 50th, and 75th percentiles of operating performance and the derivative of the probability of turnover with respect to a change in performance (sensitivity of turnover to performance) using the results in column 2 of Table 4.[13] When calculating the predicted probabilities and derivatives, we

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[12] A simulation experiment similar to that reported in footnote 9 supports this statement. In particular, we parameterized the two-signal model and used Monte Carlo simulation to evaluate the implications of different relative precisions for the estimated coefficients in logit regressions.

[13] We interpret the "sensitivity of turnover to performance" to mean the change in the probability of turnover given a small change in performance, which is not directly provided by the coefficient estimates. If the logit takes the following form: $\alpha + \beta_1 \, performance + \beta_2 \, type + \beta_3 \, (type*performance)$, the exponentiated value of β_1 is the

assume that the top manager is below retirement age (age less than 62) and that the entity's total assets and

stock performance are equal to the median values for the sample.[14]

Table 5 indicates that when operating performance is at the median or 75th percentile, the predicted

probabilities of turnover do not differ significantly between subsidiaries and stand-alone firms. However,

when $\Delta EBITD/TA_{adj}$ is at the 25th percentile (-16.5 percent), the predicted probability of turnover is 0.51 for

subsidiaries and 0.35 for stand-alone firms, and the difference is statistically significant. Thus, as suggested

by the estimated interaction coefficients reported in Table 4, the probability of turnover following poor

performance is substantially higher for subsidiaries.

A comparison of the derivatives of the probability of turnover with respect to performance for CEOs

and subsidiary managers gives the difference in the sensitivity of turnover to performance for the two types of

managers. When evaluated at the 10th, 25th, 50th, and 75th percentile value of operating performance, the

sensitivity of turnover to performance for subsidiary managers is significantly greater than the sensitivity of

turnover to performance for CEOs. For example, at the median level of performance, the derivative is -1.51

for subsidiaries and -0.46 for stand-alones. Using these derivatives to assess the change in turnover

probabilities following a one-standard deviation drop in operating performance (14.8 percent), we find that

the probability of turnover increases by 0.22 (1.51 x 0.148) for subsidiaries and by 0.07 (0.46 x 0.148) for

stand-alones. [15]

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multiplicative factor by which the odds of turnover (probability of turnover divided by the probability of no turnover) changes with a one-unit increase in *performance* for *type* = 0 firms. The exponentiated value of β_3 is the ratio of the multiplicative factor by which the odds change given a one-unit increase in *performance* for *type* = 1 firms divided by corresponding multiplicative factor for *type* = 0 firms. To compare the sensitivity of turnover to performance, we calculate the marginal effects and associated standard errors for each type of firm. For further detail, see Powers (2002) and Jaccard (2002).

[14] The economic significance is determined by a non-linear combination of the estimated parameters from the logit regression model. Consequently, the statistical significance of the predicted probability of turnover and of the derivative with respect to a change in performance is not determined by the statistical significance of a single coefficient. Instead, the statistical significance depends on the entire variance-covariance matrix of estimates. We therefore report in Table 5 the statistical significance of the predicted probabilities and derivatives using the delta method (Greene, 1997).

[15] The distributions of $\Delta EBITD/TA_{adj}$ for the subsidiary and stand-alone samples are statistically indistinguishable from one another. Therefore, all implied probabilities and marginal effects for the two samples are calculated at the same values for $\Delta EBITD/TA_{adj}$.

4.3   Robustness Checks

4.3.1   Industry Characteristics

Although we attempt to match entities based on industry, we noted earlier that in many cases

matches at the two-digit SIC code were not possible. Thus, one concern is that the differences in the

relationship of turnover to operating performance for subsidiaries and stand-alones are driven by systematic

differences in the represented industries. Parrino (1997) shows that CEO turnover depends on the

homogeneity of the industry. Univariate analysis (not reported) shows that levels of industry homogeneity do

not differ between our stand-alone and subsidiary subsamples. In column 1 of Table 6, we add Parrino's

homogeneity variable to the logit regression model (INDUSTRY_HOMOG).[16] The coefficient on the

homogeneity variable is not statistically significant, and the results with respect to the performance variables

and their interactions with SUBSID are virtually unchanged compared to the earlier reported results.

Although not reported, we also include a Herfindahl index measuring industry concentration as suggested by

DeFond and Park (1999) and find similar results.

4.3.2   Ownership and Governance Characteristics

Since our model predicts that stock ownership by principals should affect turnover, director and

officers ownership and CEO ownership are included as explanatory variables in the remaining logit

regression models displayed in Table 6. Additional motivation for inclusion of these variables is given by

Denis, et al. (1997) and Parrino (1997), who find that ownership affects the rate of CEO turnover.

Column 2 of Table 6 includes director and officer ownership, exclusive of CEO ownership,

(D&O_OWN) in the model. To allow the effect of D&O_OWN on turnover to differ between subsidiaries

and stand-alone firms, we also include an interaction term with SUBSID. The coefficient on D&O_OWN is

positive and statistically significant, but the coefficient on the interaction variable (D&O_OWN x SUBSID)

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[16]INDUSTRY_HOMOG is calculated as in Parrino (1997). It is the average value across the firms in a given industry (two-digit SIC code) of the partial correlation coefficient between the individual firm stock returns and the returns on the industry index. We calculate the measure over the 1987 – 1998 period using monthly stock returns. Following Parrino, we limit calculations to industries with at least 35 firms with complete return data across the period. When there are more than 50 firms, we choose 50 at random. The industry index is composed of these same firms. Since many industries lack 35 firms with complete return data across the 12-year period, we calculate the measure over each 4-year sub-period and average the results. This gives estimates for 30 industries. For the

is not significantly different from zero. These results indicate that higher levels of D&O_OWN are associated with higher turnover rates for both stand-alone firms and for subsidiaries. The inclusion of D&O_OWN does not materially change the estimated relationship between turnover and performance for subsidiaries or stand-alone firms.

Column 3 of Table 6 includes a variable indicating whether the chief executive officer's ownership exceeds five percent (CEO_OWN>5%), as well as an interaction variable with SUBSID.[17] Since the CEO is one of the principals responsible for monitoring the subsidiary manager, our model suggests that greater CEO ownership is likely to increase the likelihood of subsidiary manager turnover. There are, however, other potential effects of high levels of CEO ownership, not incorporated in our model. For example, if high levels of CEO ownership serve to entrench CEOs and therefore reduce their incentives to increase overall firm performance, then the likelihood of subsidiary manager turnover would decline as CEO ownership increases. The entrenchment effect of high levels of CEO ownership will also reduce the likelihood of CEO turnover.

The coefficient on CEO_OWN>5% is negative and statistically significant, but the coefficient on the interaction variable is not statistically significant. These results suggest that levels of CEO ownership greater than 5 percent are associated with lower turnover rates for both CEOs and subsidiary managers. Again, controlling for CEO ownership does not materially change the relationship between turnover and performance for either subsidiaries or stand-alone firms. Column 4 includes both ownership variables and their interactions with SUBSID. The results are similar to those previously discussed.

In addition to the ownership variables, we also include controls for other corporate governance characteristics that other studies find are related to CEO turnover. For example, we include variables to control for the percentage of directors that are insiders (Weisbach, 1988), whether the CEO is also the board chair (Goyal and Park, 2002), and whether there is outside blockholder ownership (Denis and Serrano, 1996).

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remaining industries, we estimate across 3-year or 2-year sub-periods, giving us results for a total of 42 two-digit industries.
[17] Allen (1981) and Salanick and Pfeffer (1980) also use a five percent cutoff for CEO ownership. Other cutoff levels for the dichotomous CEO ownership variable produce similar results. However, when we use a continuous CEO ownership variable, the coefficient on the CEO ownership variable is not statistically significant. Results with respect to the sensitivity of turnover to performance are unchanged regardless of the variable used to measure CEO ownership.

The estimated coefficients on these variables (not reported) are not statistically significant and the magnitude and statistical significance of the other coefficients do not change materially.

4.3.3 Alternative Performance Measures

We estimate the logit regression model using a number of different operating performance and stock price performance measures, as well as various combinations of these different performance measures. More specifically, instead of the change in industry adjusted operating performance, we use the following measures: (1) base year industry adjusted operating performance, (2) base year operating performance, and (3) change in operating performance from the base year -1 to the base year. In each case, the results (not reported) indicate that the coefficients on the operating performance variable and the interaction of the operating performance with SUBSID variable are negative and statistically significant, as reported earlier. The use of different stock price performance measures also does not change the basic results. In particular, we find similar results (not reported) if we use the cumulative raw monthly return during the base year or the cumulative return in excess of the CRSP value-weighted index during the base year.

Our analysis examines turnover over a three year period from the base year to the base year +2; however, our performance measures are from the base year. A potential concern, therefore, is that performance subsequent to the base year for stand-alones firms is better than that for subsidiaries. However, operating performance for subsidiaries in the base year + 1 and in the base year + 2 does not differ on average from the operating performance for stand-alone firms. In addition, when we add operating performance subsequent to the base year to the logit regression model, we continue to find that the coefficients on base year operating performance and base year operating performance interacted with SUBSID are negative and statistically significant.

4.3.4 Noise in the Operating Performance Measures

A potential concern regarding our operating performance measures for subsidiaries and stand-alone firms is that, despite our best efforts, they are not equally informative about the quality of the respective managers. If operating performance for stand-alone firms has greater absolute noise (less precision), then the minimum required performance (y^* in equation 2) would be lower for stand-alone CEOs and so would the

probability of turnover following poor performance.[18] We have no direct method of testing for this, although

one way in which this possibility might manifest itself is in there being greater variance in the operating

performance measure for stand-alone firms. The data, however, are not consistent with this supposition.

Controlling for size and industry, the variance of EBITD/TA over the five years prior to base year –1 for

stand-alone firms is not statistically different than that for subsidiaries.

4.3.5   Manager Tenure

A multi-period extension of the model implies that manager tenure will influence the turnover

condition (also, see Allgood and Farrell (2000)). To check whether our results regarding the sensitivity of

turnover to performance are driven by differences in the tenure of subsidiary managers versus stand-alone

CEOs, we gather data on the tenure of the managers. We are able to identify the tenure of only 77 of the

subsidiary managers and 108 of the stand-alone CEOs. These data do not indicate a significant difference in

tenure between subsidiary managers and stand-alone CEOs, either overall or among poor-performers. This

suggests that our results are not driven by differences in the tenure of the subsidiary managers and stand-

alone CEOs.

5.   Other Factors Influencing Turnover in Conglomerates

Since little is known regarding turnover of subsidiary managers, we conclude our analysis with

separate logit regressions that utilize only the subsidiary portion of our sample. The first specification in

Table 7 includes the variables previously discussed, but without the now unnecessary dichotomous variable

for subsidiaries and the associated interaction effects. The coefficient estimates generally are similar to those

reported earlier (see column three in Table 6 for the most comparable results).[19]

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[18] This point differs from the earlier discussion of the relative precisions of operating performance and stock price performance. Using the notation of the model, the discussion in this section is about σ_ε for subsidiaries versus σ_ε for stand-alone firms. The earlier discussion was about $\sigma_\varepsilon^{-2}/(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2})$ versus $\sigma_\eta^{-2}/(\sigma_\varepsilon^{-2} + \sigma_\eta^{-2})$, where σ_ε is the noise in the operating performance measure and σ_η is the noise in the stock price performance measure.
[19] Fee and Hadlock (2002) document "the team nature of dismissals" for the top five executives of the firm. That is, they find that turnover of non-CEO executives increases when the CEO turns over. We, therefore, include a dichotomous variable indicating whether the parent CEO turned over (results not reported in tables).   While the sign of the coefficient estimate is positive, it is not statistically significant.

Specifications in columns 2 through 4 include characteristics that we hypothesize could affect the relationship between turnover and performance for subsidiary managers. These characteristics are whether the subsidiary manager is a member of the board of directors (16 percent of managers in our sample have a seat on the board), the degree of parent diversification, and whether the subsidiary operates in an industry that is related to the primary industry of the parent. To examine whether these variables influence the relationship of turnover to performance, we add each of these characteristics (one at a time) to the logit regression model given in column one and interact the included characteristic with the operating performance variable.[20]

One might expect that a subsidiary manager who has a seat on the board of directors has greater power and is immunized to some extent from turnover concerns. However, as seen in column two, we do not find that being a member of the board of directors has a significant impact on the relationship of turnover to performance.

Column 3 of Table 7 reports the impact of parent diversification on the probability of turnover, where the variable DIVERSIFICATION is calculated as in Palepu (1985).[21] Our motivation for including a diversification measure in our analysis is the documented finding that the average diversified firm seems to be worth less than the sum of its parts (e.g., Lang and Stulz (1994), Berger and Ofek (1995)). One potential source of this "diversification discount" is that more diversified conglomerates may be less likely to replace inefficient subsidiary managers.[22] While our comparison of subsidiary manager turnover to stand-alone CEO turnover suggests that internal labor markets do not contribute to a conglomerate discount, it is possible that among conglomerates, the relationship of turnover to performance is weaker when the conglomerate is more diversified. The coefficient on the variable that interacts performance with DIVERSIFICATION is positive and statistically significant (p-value of 0.04). However, this result is sensitive to the measure used to quantify

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[20] We investigate the impact of these characteristics one at a time to reduce concerns about collinearity resulting from the operating performance measure being included in the equation separately and also interacted with several other variables. Also, the industry characteristics are highly correlated. We also interact these characteristics with the stock price performance measure. Since the coefficients on the interacted variables are never statistically significant, we do not report these results.

[21] Palepu (1985) measures diversification as the sum across parent industries of (subsidiary sales / total sales)*(log(1/(subsidiary sales / total sales))). A focused firm will have a diversification measure of zero. A firm with three divisions of equal size would have a diversification measure of approximately 1.1.

[22] For other potential explanations involving inefficient internal capital markets, see e.g., Scharfstein (1998), Rajan, et al. (2000), and Gertner, et al. (2002).

the degree of diversification. For example, when a Herfindahl index is used, we do not find a statistically significant relationship between turnover and the degree of parent diversification.

Column 4 reports the impact on turnover if the subsidiary operates in a line of business that is related to the parent's primary line of business. We classify the subsidiary as related if it has the same two-digit SIC code as the parent. Several reasons suggest that relatedness will strengthen the relationship between turnover and performance. First, relatedness is likely to increase headquarters' familiarity and understanding of the subsidiary's operations, which will imply greater filtering of noise and a more stringent turnover criteria. Second, due to the existence of operating synergies, the performance of related subsidiaries is likely to have greater impact on the ultimate success of the parent, and thus increase the sensitivity of headquarters executives' wealth to subsidiary performance. This could lead to less leeway being granted to managers of poorly performing related subsidiaries. Third, as Gertner, et al. (1994) argue, assets of closely related projects can be redeployed more easily in a conglomerate, effectively reducing the cost of reorganization. They therefore predict that "business-unit managers inside related conglomerates will be more likely to be replaced …following poor performance than … business-unit managers inside unrelated conglomerates" (p.1228). Finally, Parrino (1997) notes that outside CEO succession following CEO turnover is more likely in homogenous industries because the firm-specific human capital of the outsiders will be closer to the required firm-specific human capital for the replacement CEO. A similar argument suggests that the pool of replacement managers with the skills necessary to run a project may be deeper in the internal labor market when there is greater relatedness, reducing the cost of replacement. Consistent with these stories, in column 4 the coefficient on the variable that interacts operating performance with RELATED is negative and statistically significant.[23]

Table 8 reports the predicted probabilities of turnover using the model in column 4 of Table 7 for various levels of operating performance for both "related" and "unrelated" subsidiaries. For a subsidiary that has operating performance at the 25th percentile (-16.5%), the predicted probability of turnover is 0.57 if the subsidiary operatess in a related line of business and 0.39 if it does not. Although large in economic terms,

this difference is not statistically significant at the 10 percent level. The difference in predicted turnover probabilities is statistically significant if performance is extremely poor, e.g., at the 10th percentile level. Table 8 also reports the derivative of the probability of turnover with respect to a change in operating performance for related and unrelated subsidiaries. The derivatives for related and unrelated subsidiaries are significantly different when operating performance is between the 25th and 75th percentile. Using the derivatives at the median value of operating performance, if a subsidiary's performance drops by one standard deviation (14.9 %) from the median, the probability of turnover increases by 0.34 (2.30 x 0.149) for "related" subsidiaries and by 0.15 (1.01 x 0.149) for "unrelated" subsidiaries.[24]

6.   Summary and Conclusions

Prior empirical research conclusively demonstrates that CEO turnover becomes more likely as either operating performance or stock price performance declines. Prior research has also identified many factors, such as board composition, which affect the turnover performance relationship. While these prior studies provide valuable information on when the market for corporate control and the board of directors function most effectively as a disciplining mechanism, they provide little insight on whether the market for corporate control and the board of directors function well compared to alternative disciplining mechanisms. A newer line of inquiry analyzes turnover of lower level executives who are subject to one such alternative mechanism, namely the discipline provided by more senior executives in the corporate hierarchy. With the exception of Blackwell, et al. (1994), however, these studies utilize firm level performance measures that may contain limited information about the ability of lower level executives. Thus, insights from this newer literature regarding the relative efficacy of various disciplining mechanisms are also limited.

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[23] On average, related subsidiaries constitute 35.9 percent of total parent assets while unrelated subsidiaries constitute 24.5 percent. Relative size, however does not appear to be driving our results. If we add a variable for relative size, we continue to find the same statistical and economic significance for relatedness.

[24]Related subsidiaries do not explain the entire difference in the relationship of turnover to performance between subsidiaries and stand-alone firms. If we interact operating performance with separate dichotomous variables indicating related subsidiaries and unrelated subsidiaries in the logit regressions comparing subsidiaries to stand-alone firms, the coefficients on both interaction terms are significant at the five percent level, indicating that the strength of the relationship between turnover and performance is greater for both types of subsidiaries than for stand-alone firms.

Our research overcomes both of the limitations outlined above. The first innovation of our research is that we compare turnover of subsidiary managers inside diversified firms to turnover of CEOs of comparable stand-alone firms. The second innovation of our research is that we employ operating performance measures that reflect the results of the business entities actually supervised by the respective managers. Any differences in the relationship between turnover and operating performance, therefore, are likely to be a function of differences in the respective disciplining mechanisms, and not due to differences in the informativeness of the performance measures or differences in the underlying business entities.

Our results show that turnover of subsidiary managers is significantly more likely following poor performance and is significantly more sensitive to changes in performance than is turnover of CEOs of comparable stand-alone firms. Our model suggests several reasons for these results. One possibility is that the explicit cost of finding a replacement and paying severance is lower for subsidiary managers. Although we have limited supporting evidence, our speculation is that these explicit costs are relatively small and are unlikely to be the major factor underlying our findings. For example, Lafanowicz, et al. (2000) find that the median golden parachute for CEOs of acquired firms is only 0.4 percent of the pre-acquisition target's value. We suspect that weaker incentives and greater private replacement costs for boards of directors compared to headquarters executives are more important forces. This interpretation is consistent with prior research that documents that CEO turnover is more sensitive to performance when directors and officers (exclusive of the CEO) own a large block of shares (Denis, et al., 1997), independent outsiders occupy a large percentage of board seats (Weisbach, 1998), outside blockholder ownership is large (Denis and Serrano, 1996), and the CEO is not concurrently the chairman of the board of directors (Goyal and Park, 2002). Thus, the findings suggest that the disciplining mechanism for CEOs is lenient compared to the disciplining mechanism for subsidiary managers.

Our results also provide new insights about conglomerate organizations. Prior research suggests that the scope of conglomerates is restricted by inefficiencies in their internal capital markets (e.g., Gertner, et al., 1994), difficulties in valuing disparate collections of businesses (e.g., Habib, et al., 1997), and difficulties in providing incentives to division managers (e.g., Schipper and Smith, 1986). Our results, however, indicate

that a conglomerate form of organization provides a stricter disciplining mechanism that may at least partly offset other limitations of conglomerates.

We also examine turnover of subsidiary managers in conglomerates in isolation. Our main finding, which is consistent with a number of stories, including one in Gertner, et al. (1994), is that for subsidiaries that operate in their parent's primary line of business, there is a higher probability of turnover following poor performance and a greater sensitivity of turnover to performance. Thus, the disciplining mechanism inside a conglomerate seems to be stricter when the division operates in an industry that is related to the primary industry of the parent firm. This provides a new rationale for why conglomerates composed of related businesses are valued more highly on average than conglomerates composed of unrelated businesses (Berger and Ofek, 1995).

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Appendix A

In this appendix, we provide additional structure to the model to generate the prediction that the probability of turnover increases as the average value of y* increases. Assume that the parameters C, C_p, and α, vary by entity, which implies that there are entity–specific values of y^*, but that these values are unobservable. More specifically, assume that y^* for both stand-alone firms and subsidiaries have a normal distribution with expected values equal to $y^*_{S\text{-}A}$ and y^*_{SUB}, respectively, where $y^*_{S\text{-}A} < y^*_{SUB}$. For a given value of observed performance, y, the probability of CEO turnover equals $1 - F(y - y^*_{S\text{-}A})$ and the probability of subsidiary manager turnover equals $1 - F(y - y^*_{SUB})$, where F( ) is the cumulative distribution function. Since $y^*_{S\text{-}A} < y^*_{SUB}$, the probability of CEO turnover is less than the probability of subsidiary manager turnover. However, for very high (low) values of performance, both probabilities will be small (large), and their difference will be small. The greatest difference in turnover probabilities occurs when performance is equal to the average of the minimum required performance levels ($y^*_{S\text{-}A}$ and y^*_{SUB}). Thus, conditional on poor performance (but not too poor), the probability of turnover should be materially higher for subsidiary managers than for CEOs.

The sensitivity of turnover to performance is defined as the absolute value of the derivative of the probability of turnover with respect to a change in performance. For stand-alone firms, the derivative equals $-f(y - y^*_{S\text{-}A})$ and for subsidiaries, the derivative equals $-f(y - y^*_{SUB})$, where f( ) is the density function for the values of y^*. Given that $y^*_{SUB} > y^*_{S\text{-}A}$, the absolute value of the derivative for subsidiaries is greater than that for stand-alone firms whenever performance (y) is greater than y+, where y+ is the value of performance at which the two density function intersect.

Table 1
Characteristics of Sample

Poor performance subsidiaries are segments with operating performance above the industry median in the base year –1 and below the industry 25th percentile in the base year and for which the managers of the segment are identifiable. For each poor performance subsidiary, a good performance subsidiary, a poor performance stand-alone, and a good performance stand-alone firm are selected from the same year. Poor performance stand-alones have operating performance above the industry median in the base year -1 and below the industry 25th percentile in the base year. Good performance subsidiaries and stand-alone firms have operating performance above the industry median in both the base year –1 and the base year.

Panel A: Distribution of Poor Performance Subsidiaries by Base Year
Table entries are the number of poor performance subsidiaries in a base year. The good performance subsidiaries, poor performance stand-alone firms, and good performance stand-alone firms are matched to have the same base year as the poor performance subsidiaries.

Base Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of Entities	13	5	9	8	11	6	7	8	10	9	9	6

Panel B: Distribution of Sample Firms by SIC code
Table entries are the number of entities in selected industries for the four types of entities in the sample. Industries having at least four poor performance subsidiaries are listed.

SIC Code	Industry Name	Poor Performance Subsidiaries	Poor Performance Stand-alones	Good Performance Subsidiaries	Good Performance Stand-alones
35	Machinery	12	12	17	18
37	Transportation Eq.	10	3	6	8
26	Paper & Allied Products	8	1	5	3
28	Chem. & Allied Products	8	5	10	12
34	Fabricated Metals	7	4	9	6
36	Electrical Equipment	6	12	7	4
27	Printing & Publishing	5	3	4	4
38	Measuring Instruments	4	4	4	6
33	Primary Metal Industries	4	4	0	1
	Other	37	53	39	39
	Totals	101	101	101	101

Table 2
Descriptive Statistics

Poor-performance subsidiaries and stand-alone firms have operating performance above the industry median in the base year –1 and below the industry 25th percentile in the base year. Good-performance subsidiaries and stand-alone firms have operating performance above the industry median in both the base year –1 and the base year. Each column has 101 observations. The mean is reported at the top of each cell and the median at the bottom. P-values reported are for a t-test (top number) and rank-sum test (bottom number), where poor performance subsidiaries and stand-alones are compared separately from good performance subsidiaries and stand-alones. Assets is the book value of assets in the base year for the subsidiary or stand-alone firm in millions of dollars. EBITD/TA equals earnings before interest taxes and depreciation divided by assets. EBITD/TA$_{adj}$ equals industry adjusted EBITD/TA, i.e., the entity's EBITD/TA minus the median industry EBITD/TA. ΔEBITD/TA$_{adj}$ is the change from the base year –1 to the base year in EBITD/TA$_{adj}$ (industry adjusted EBITD/TA are winsorized at –0.5, 0.5). CAR_IND equals the cumulative stock return in excess of an equal weighted industry return for the base year. Information concerning ownership and board characteristics, reported as of the year prior to the base year or the base year (earliest available), comes from proxy statements and 10Ks. CEO Ownership, Director & Officer Ownership, and Outside Blockholder Ownership reflect "beneficial ownership" and are reported as a percentage of total shares outstanding. Director and officer ownership excludes the CEO's ownership. Outsiders are people who are not current or former employees, are not related to current or former employees on the board, and do not have material business relations with the firm. Outside blockholders have at least a 5 percent ownership stake. Manager Age is for the year prior to the base year.

	Poor Performers			Good Performers		
	Subsidiaries	Stand-alones	P-value	Subsidiaries	Stand-alones	P-value
Assets (in $millions)	$1,048.7	$503.6	0.10	$861.8	$1,033.8	0.62
	$154.3	$128.2	0.30	$141.0	$150.0	0.90
EBITD/TA$_{adj}$ in base year –1 (%)	6.2	4.7	0.10	15.9	10.4	0.01
	4.2	2.7	0.01	11.7	8.3	0.01
EBITD/TA$_{adj}$ in base year (%)	-13.4	-15.6	0.17	15.1	9.7	0.01
	-9.4	-12.1	0.05	10.5	7.2	0.01
ΔEBITD/TA$_{adj}$ (%)	-19.6	-20.3	0.72	-0.7	-0.7	0.96
	-15.5	-16.6	0.81	0.0	-0.7	0.50
CAR_IND (%)	7.9	14.3	0.51	18.8	24.2	0.45
	4.9	-4.2	0.19	9.9	16.1	0.54
CEO Ownership (%)	5.9	12.4	0.01	7.3	10.9	0.07
	0.8	5.2	0.01	1.1	5.0	0.01
Director & Officer Ownership (%)	8.8	16.4	0.01	11.8	14.9	0.18
	4.1	9.3	0.01	5.5	8.3	0.02
Number of Directors	10.3	7.2	0.01	9.9	8.1	0.01
	10.0	7.0	0.01	10.0	7.0	0.01
Outside Blockholder Ownership (%)	13.6	13.9	0.88	16.4	12.9	0.13
	11.4	8.0	0.66	10.8	8.9	0.26
Proportion of Outsiders on Board (%)	68.8	61.2	0.01	73.8	64.8	0.01
	72.7	66.7	0.01	77.8	66.7	0.01
CEO is Chairman (%)	75.2	69.3	0.35	66.3	70.3	0.55
Division Manager is a Board Member (%)	12.9	-		18.8	-	
Manager Age (years)	51.6	52.6	0.35	50.5	54.0	0.01
	51.0	51.0	0.50	50.0	55.0	0.01

Table 3
Turnover Rates

Percentage of subsidiary managers (in the case of subsidiaries) and CEOs (in the case of stand-alone firms) who turn over between the base year and the base year +2. Poor-performance subsidiaries and stand-alone firms have operating performance above the industry median in the base year –1 and below the industry 25th percentile in the base year. Good-performance subsidiaries and stand-alone firms have operating performance above the industry median in both the base year –1 and the base year. There are 101 observations in each cell. The chi-square statistic is for a test of whether the probability of turnover is the same for the entries in the rows or columns. ** and * indicate significance at the 0.01 and 0.05 level, respectively.

		Performance		Chi-Square Statistic for test of equal row percentages
		<u>Poor</u>	<u>Good</u>	
	Subsidiary	62.4%	18.8%	39.7**
Organizational Form				
	Stand-alone	45.5%	26.7%	7.7**
Chi-Square Statistic for test of equal column percentages		5.8*	1.8	

Table 4
Logit Analysis of Top Manager Turnover

The dependent variable equals one if turnover of the top manager (CEOs in the case of stand-alone firms and subsidiary managers in the case of subsidiaries) occurred between the base year and the base year + 2. ΔEBITD/TA$_{adj}$ is the change from the base year -1 to the base year in industry adjusted EBITD/TA, where industry adjusted EBITD/TA equals the entity's EBITD/TA minus the median industry EBITD/TA (industry adjusted EBITD/TA values are winsorized at -.5, .5). SUBSID equals one if the observation is for a subsidiary and zero if the observation is a stand-alone firm. CAR_IND equals the cumulative stock return in excess of an equal weighted industry return for the base year. AGE>62 equals one if the manager/CEO's age is greater than 62 in the year prior to the base year. LOG_ASSETS is the natural logarithm of total assets for the year prior to the base year. P-values are given in parentheses below coefficient estimates.

	Column 1	*Column 2*	*Column 3*
Constant	-1.52	-1.47	-0.90
	(0.01)	(0.01)	(0.01)
ΔEBITD/TA$_{adj}$	-2.21	-2.19	
	(0.03)	(0.05)	
ΔEBITD/TA$_{adj}$ X SUBSID	-4.38	-4.56	
	(0.01)	(0.01)	
CAR_IND		-0.63	-0.64
		(0.02)	(0.02)
CAR_IND X SUBSID		-0.18	-0.28
		(0.74)	(0.58)
SUBSID	0.14	-0.09	-0.36
	(0.62)	(0.76)	(0.11)
AGE>62	0.88	1.17	1.16
	(0.01)	(0.01)	(0.01)
LOG_ASSETS	0.11	0.11	0.05
	(0.05)	(0.07)	(0.42)
Observations	404	390	390
Pseudo R^2	0.09	0.11	0.11

Table 5
Predicted Turnover Probabilities and Derivatives for Subsidiaries Versus Stand-alone Firms
Predicted probabilities of turnover and derivatives of the probability of turnover with respect to a change in performance (ΔEBITD/TA$_{adj}$) are based on the coefficient estimates in column 2 of Table 4. ΔEBITD/TA$_{adj}$ is the change in industry adjusted EBITD/TA from the base year –1 to the base year, where industry adjusted EBITD/TA equals the entity's EBITD/TA minus the median industry EBITD/TA (industry adjusted EBITD/TA values are winsorized at -.5, .5). For each value of ΔEBITD/TA$_{adj}$ listed in the table, the predicted turnover probability and derivative is calculated using the following values for the other explanatory variables: AGE>62 equals zero, ASSETS equals the median value of total assets for the entire sample, SUBSID equals one for the subsidiaries and zero for the stand-alone firms, CAR_IND (cumulative stock return in excess of an equal weighted industry return for the base year) equals its median value. Standard errors used for calculating p-values for the test of equality for both the predicted probabilities and the derivative of the probability are calculated using the delta method.

ΔEBITD/TA$_{adj}$		Predicted Probability of Turnover		
Percentile	Value	Subsidiaries	Stand-alone Firms	p-value for test of no difference
10th	-30.1%	0.73	0.42	0.01
25th	-16.5%	0.51	0.35	0.01
50th	-6.0%	0.34	0.30	0.48
75th	-0.5%	0.26	0.28	0.78

ΔEBITD/TA$_{adj}$		Derivative of the Probability of Turnover w.r.t. a Change in Performance		
Percentile	Value	Subsidiaries	Stand-alone Firms	p-value for test of no difference
10th	-30.1%	-1.34	-0.53	0.01
25th	-16.5%	-1.69	-0.50	0.01
50th	-6.0%	-1.51	-0.46	0.01
75th	-0.5%	-1.30	-0.44	0.01

Table 6
Logit Analysis of Top Manager Turnover Controlling for Industry and Ownership Characteristics

The dependent variable equals one if turnover of the top manager (CEOs in the case of stand-alone firms and subsidiary managers in the case of subsidiaries) occurred between the base year and the base year + 2. ΔEBITD/TA$_{adj}$ is the change in industry adjusted EBITD/TA from the base year –1 to the base year, where industry adjusted EBITD/TA equals the entity's EBITD/TA minus the median industry EBITD/TA (industry adjusted EBITD/TA values are winsorized at -.5, .5). CAR_IND is the cumulative stock return in excess of an equal weighted industry return for the base year. SUBSID equals one if the observation is for a subsidiary and zero if the observation is a stand-alone firm. AGE>62 equals one if the manager/CEO's age was greater than 62 in the year prior to the base year. LOG_ASSETS is the natural logarithm of total assets for the year prior to the base year. INDUSTRY_HOMOG equals Parrino's (1997) industry homogeneity measure. D&O_OWN is percent ownership of directors and officers less CEO ownership. CEO_OWN>5% equals one if CEO ownership is greater than five percent. P-values are given in parentheses below coefficient estimates.

	Column 1	*Column 2*	*Column 3*	*Column 4*
Constant	-1.04	-2.13	-0.96	-1.64
	(0.04)	(0.01)	(0.03)	(0.01)
ΔEBITD/TA$_{adj}$	-2.05	-2.46	-2.28	-2.54
	(0.06)	(0.03)	(0.04)	(0.02)
ΔEBITD/TA$_{adj}$ X SUBSID	-4.33	-4.68	-4.14	-4.54
	(0.02)	(0.01)	(0.01)	(0.01)
CAR_IND	-0.68	-0.62	-0.61	-0.61
	(0.02)	(0.03)	(0.03)	(0.03)
CAR_IND X SUBSID	-0.44	-0.19	-0.21	-0.23
	(0.46)	(0.73)	(0.69)	(0.68)
SUBSID	-0.07	0.03	-0.33	-0.20
	(0.80)	(0.94)	(0.31)	(0.61)
AGE>62	1.14	1.25	1.23	1.30
	(0.01)	(0.01)	(0.01)	(0.01)
LOG_ASSETS	0.13	0.17	0.08	0.13
	(0.05)	(0.01)	(0.24)	(0.06)
INDUSTRY_HOMOG	-2.33			
	(0.21)			
D&O_OWN		1.98		1.93
		(0.02)		(0.03)
D&O_OWN X SUBSID		-0.10		-0.07
		(0.94)		(0.96)
CEO_OWN>5%			-0.69	-0.66
			(0.04)	(0.05)
(CEO_OWN>5 %) x SUBSID			0.44	0.37
			(0.39)	(0.48)
Number of Observations	364	390	390	390
Pseudo R^2	0.11	0.13	0.12	0.14

Table 7
Logit Analysis of Subsidiary Manager Turnover

The dependent variable equals one if turnover of the subsidiary manager occurred between the base year and the base year + 2. $\Delta EBITD/TA_{adj}$ is the change in industry adjusted EBITD/TA from the base year –1 to the base year, where industry adjusted EBITD/TA equals the entity's EBITD/TA minus the median industry EBITD/TA (industry adjusted EBITD/TA values are winsorized at -.5, .5). AGE>62 equals one if the manager's age was greater than 62 in the year prior to the base year. LOG_ASSETS is the natural logarithm of total assets for the year prior to the base year. CAR_IND is the cumulative stock return in excess of an equal weighted industry return for the base year. D&O_OWN is percent ownership of directors and officers less CEO ownership. CEO_OWN>5% equals one if CEO ownership is greater than five percent. MANAGER ON BRD equals 1 if the top subsidiary manager is a member of the board of directors. RELATED equals 1 if the two-digit SIC code for the subsidiary is the same as the primary two-digit SIC code for the parent. DIVERSIFICATION is the Palepu (1985) diversification measure calculated as the sum across parent industries of (subsidiary sales / total sales)*(log(1/(subsidiary sales / total sales))). P-values are given in parentheses. Each specification is estimated with 197 observations (five parent firms do not have complete return data).

	Column 1	*Column 2*	*Column 3*	*Column 4*
Constant	-2.34	-2.43	-2.99	-2.13
	(0.01)	(0.01)	(0.01)	(0.01)
$\Delta EBITD/TA_{adj}$	-8.63	-8.05	-13.54	-5.05
	(0.01)	(0.01)	(0.01)	(0.01)
AGE>62	3.13	2.82	3.147	3.10
	(0.01)	(0.01)	(0.01)	(0.01)
LOG_ASSETS	0.18	0.20	0.20	0.19
	(0.08)	(0.06)	(0.05)	(0.06)
CAR_IND	-0.81	-0.83	-0.82	-0.85
	(0.09)	(0.08)	(0.09)	(0.08)
D&O_OWN	2.33	2.26	2.52	2.32
	(0.06)	(0.07)	(0.05)	(0.06)
CEO_OWN>5%	-0.22	-0.23	-0.10	-0.15
	(0.62)	(0.61)	(0.82	(0.74)
MANAGER ON BRD		0.53		
		(0.35)		
(MANAGER ON BRD) x $\Delta EBITD/TA_{adj}$		1.74		
		(0.71)		
DIVERSIFICATION			0.89	
			(0.14)	
DIVERSIFICATION x $\Delta EBITD/TA_{adj}$			8.85	
			(0.04)	
RELATED				-0.42
				(0.35)
RELATED x $\Delta EBITD/TA_{adj}$				-6.59
				(0.04)
Pseudo R^2	0.22	0.20	0.22	0.22

Table 8
Impact of RELATED on Predicted Probabilities and Derivatives for Subsidiary Manager Turnover
Predicted turnover probabilities and derivatives with respect to a change in performance (ΔEBITD/TA$_{adj}$) are based on the coefficient estimates in column 3 of Table 7. ΔEBITD/TA$_{adj}$ is the change in industry adjusted EBITD/TA from the base year -1 to the base year, where industry adjusted EBITD/TA equals the entity's EBITD/TA minus the median industry EBITD/TA (industry adjusted EBITD/TA values are winsorized at -.5, .5). For each value of ΔEBITD/TA$_{adj}$ listed in the table, the predicted turnover probability and derivative is calculated using the following values for the other explanatory variables: AGE>62 equals zero, ASSETS, CAR_IND (the cumulative stock return in excess of an equal weighted industry return for the base year), D&O_OWN (percent ownership of directors and officers less CEO ownership), and CEO_OWN equal their median values for the entire sample, and RELATED equals one for subsidiaries with the same 2-digit SIC code as the parent's primary SIC code, and zero otherwise. Standard errors used in calculating the p-values for the test of equality for both the predicted probabilities and the derivative of the probability are calculated using the delta method.

		Predicted Probability of Turnover		
ΔEBITD/TA$_{adj}$				
Percentile	Value	Related Subsidiaries	Unrelated Subsidiaries	p-value for test of no difference
10th	-30.3%	0.86	0.56	0.02
25th	-16.5%	0.57	0.39	0.15
50th	-6.1%	0.27	0.27	0.96
75th	-0.3%	0.16	0.22	0.47

		Derivative of the Probability of Turnover with respect to a change in performance		
ΔEBITD/TA$_{adj}$				
Percentile	Value	Related Subsidiaries	Unrelated Subsidiaries	p-value for test of no difference
10th	-30.3%	-1.39	-1.24	0.80
25th	-16.5%	-2.87	-1.20	0.03
50th	-6.1%	-2.30	-1.01	0.04
75th	-0.3%	-1.57	-0.87	0.10