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## Voting with their feet: institutional ownership changes around forced CEO turnover<sup>☆</sup>

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### Abstract

We investigate whether institutional investors “vote with their feet” when dissatisfied with a firm’s management by examining changes in equity ownership around forced CEO turnover. We find that aggregate institutional ownership and the number of institutional investors decline in the year prior to forced CEO turnover. However, selling by institutions is far from universal. Overall, there is an increase in shareholdings of individual investors and a decrease in holdings of institutional investors who are more concerned with holding prudent securities, are better informed, or are engaged in momentum trading. Measures of institutional ownership changes are negatively related to the likelihoods of forced CEO turnover and that an executive from outside the firm is appointed CEO.

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## 1. Introduction

Debate regarding the appropriate role of institutional investors in corporate governance has intensified as institutions have become the majority owners of most large US corporations in recent years. The academic and popular presses focus on institutional shareholder activism.<sup>1</sup> While this literature helps us understand the role of institutional activism in monitoring management, we still know little about the selling of shares, which may be the most common action taken by institutional investors who are dissatisfied with management. The perceived prevalence of such institutional selling, often termed the “Wall Street Rule,” is reflected in a comment by Lowenstein (1988, p. 91), in which he states, “[Institutional investors] implicitly praise or criticize management, by buying or selling, but seldom get involved more directly, even to the extent of a phone call. There is almost no dissent from the Wall Street Rule....”

This study reports the first empirical examination of the selling of shares in poorly managed firms by institutional investors. We address three important economic issues. First, we examine the extent to which institutional investors sell shares when they are dissatisfied with management’s performance. Second, we examine what motivates some institutions to sell shares. Specifically, we focus on the characteristics of the institutions that sell and how the equity ownership structures of companies change as a result. Third, we examine whether changes in shareholder composition influence decisions made by the board of directors.

We investigate these issues by examining investor behavior around forced CEO turnover, a specific corporate event that signals at least some investors are unhappy with management’s performance. Thus, we identify a period during which, ex post, we can determine there were problems with the firm’s management and examine ex ante investor behavior.

While many market observers clearly believe institutional investors often sell shares when dissatisfied with management (as indicated, for example, by the above quote and common expressions such as, “following the Wall Street Rule” and “taking the Wall Street Walk”), whether they actually do so, to what extent, and why they do so, remain open empirical questions. It is important to recognize that any potential explanation for selling must not only explain why these securities become less attractive to certain types of institutional investors, but also why these securities become relatively less attractive to those investors than to other investors. We examine four potential explanations for institutional selling prior to forced CEO turnover:

- H1: Abnormal returns tend to be negative in the years leading up to forced turnover and some institutional investors are momentum traders.
- H2: Institutions abandon the securities of firms that subsequently force their CEO from office because these institutions favor prudent securities and shares of such firms become less prudent in the years prior to CEO turnover.

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<sup>1</sup> See, for example, Smith (1996), Carleton et al. (1998), Karpoff et al. (1996), Wahal (1996), Gillan and Starks (1998, 2000), and Del Guercio and Hawkins (1999).

- H3: Some institutions sell shares in the period before forced turnover in anticipation of negative abnormal returns because these institutions are better informed than other investors. Recent evidence (Wermers, 1999; Nofsinger and Sias, 1999; Jones et al., 1999; Wermers, 2000; Sias et al., 2001) suggests that institutional investors are better informed than other investors, particularly individual investors.
- H4: Some institutions sell the shares they hold because they believe corporate governance structures make direct action (i.e., trying to influence the firm's actions) too costly.

Institutional selling can affect board decisions if directors care about the characteristics of their firm's shareholder base. Some observers, such as Lowenstein (1988), argue that boards are largely indifferent to changes in shareholder composition due to the relatively high turnover (short-term holding periods) of institutional investments and the small relative interests that many institutions hold. Others (Brancato, 1997) contend that directors should, and do, care. For example, directors may be eager to retain shareholders who are less likely to oppose their decisions. Brickley et al. (1988) report evidence that some shareholders are pressure-sensitive due to business relationships with the company. Alternatively, directors may value the credibility associated with effective monitoring by some institutions (Allen et al., 2000). Similarly, firms may care how trading by certain types of institutional investors affects the behavior of their stock price. For example, Hotchkiss and Strickland (2002) provide evidence that institutional shareholder composition affects stock price behavior around corporate information releases.

The demand for services from consultants who specialize in advising public corporations on ownership composition suggests that directors do care who owns their firms' shares. Consulting firms such as Georgeson & Company and Corporate Investor Communications, Inc. monitor firms for significant shifts in their shareholder composition and provide advice on how to attract "desirable types" of institutions as shareholders. Moreover, the National Investor Relations Institute (NIRI) offers seminars that address issues such as "targeting techniques" and altering "shareholder mix."

Characteristics of the shareholder base aside, institutional selling can also affect corporate decisions through its impact on share prices. Institutional selling can result in price pressure that negatively affects the personal wealth of individual directors by reducing the value of shares they hold as well as the value of their human capital in the labor market. Information effects arising from institutional selling can also push prices down if other investors view the change in ownership structure as an indicator of future returns and take actions that further depress prices. Brown and Brooke (1993) and Sias et al. (2001) provide evidence on price pressure from institutional selling and Bikhchandani et al. (1992) provide a model of institutional investors inferring information from each other's trades.

Our analysis of changes in shareholder composition around forced CEO turnover announcements yields interesting insights into investor behavior. We begin with an

analysis of changes in aggregate institutional versus individual investor ownership around forced CEO turnover. We find strong evidence that institutional ownership declines (or equivalently, ownership by individual investors increases) prior to forced CEO turnover. Specifically, we show a sell-off by institutional investors during the two years prior to the turnover, with the greatest sell-off occurring during the four quarters immediately before the CEO is fired. On average, institutional investors decrease their holdings by 12% in the year prior to CEO turnover. The reduction in shares, however, is not uniform across all institutional investors. Of the 19,104 institutional investors that hold positions in these companies sometime in the two years prior to forced CEO turnover, 10,401 (54.44%) reduce their ownership, and 8,624 (45.14%) increase their ownership. Thus, while some institutional investors are selling, many other institutional investors (as well as individual investors) are buying.

Abnormal shifts in shareholder composition stop soon after the CEO has been forced from office, and institutional investment, on average, increases in the two years following forced turnover. This increase in institutional ownership, however, is largely accounted for by the firm's relative performance and marketwide increases in institutional ownership. Although forcing the CEO from office appears to stem from the abnormal decline in institutional holdings, there is no evidence that it leads to an abnormal increase in institutional ownership.

We focus next on understanding why some institutional investors abandon these securities. Specifically, we focus on the characteristics of the institutions that sell shares. We find some support for H1 (the momentum trading explanation), that is, some institutional investors abandon stocks prior to forced CEO turnover because these stocks have recently performed poorly. Nonetheless, an analysis of abnormal changes in institutional ownership shows that the relation between returns and changes in institutional ownership cannot fully explain the change in shareholder composition. In fact, the abnormal decline in institutional ownership is even greater than the raw decline. In addition, we find that institutional investors abandon stocks that subsequently experience forced CEO turnover to a much greater degree than a control sample matched on time, market capitalization, and stock performance.

We also find support for H2, that some institutional investors abandon stocks of firms that subsequently force CEO turnover because these stocks have become less prudent and these investors favor prudent securities. Specifically, we find that firms that cut or eliminate dividends experience a greater institutional exodus than firms that do not and that firms with forced CEO turnover have a greater frequency of dividend cuts than either firms in the matched control sample or firms with voluntary CEO turnover. Further consistent with the explanation that some institutions sell because of prudence concerns, share prices at the firms with forced turnover tend to be more volatile than share prices in the matched control or voluntary turnover samples during the four quarters leading up to the turnover. Moreover, bank trust departments, the most prudent class of institutional investors, account for the largest exodus. Although the selling by institutions most concerned with holding prudent securities partially explains the change in ownership structure we observe, it does not appear to fully explain the change. Controlling for dividend cuts and eliminations, institutional investors still abandon forced turnover sample firms to a greater degree

than other firms. In addition, even though share prices of the firms in the forced turnover sample remain more volatile than share prices in the other samples following CEO turnover, except for bank trust departments, abnormal selling by institutions stops once the CEO is forced from office.

The evidence also suggests that some institutional investors abandon shares prior to forced CEO turnover because these investors are better informed than other investors (H3). We posit that investors with larger holdings are more likely to be informed on the prospects of the firm because they have a greater incentive to expend resources to become informed. Therefore, if some institutions sell in the pre-turnover period because they recognize that shares of firms in the forced turnover sample are poor investments, we should observe institutions with larger positions abandoning shares to a greater degree than institutions with smaller positions. Our analysis shows just such a pattern. In addition, the class of institutional investor that appears most informed (independent investment advisors) accounts for a large portion of the sell-off in the year before the turnover. Moreover, consistent with previous work, we find evidence that institutional investors are better informed than other investors. Stocks purchased by institutional investors outperform those they sell over the following four years.

We find limited support for the hypothesis that some institutional investors abandon the stocks because they believe governance structures make direct action too costly (H4). Marginally statistically significant evidence suggests that institutional investors are more likely to abandon a stock when the CEO is a member of the founding family. However, we find no evidence that the change in ownership structure is related to other governance variables, specifically, board composition or CEO share ownership.

In sum, institutional investors most concerned with holding prudent securities, better-informed institutions, and institutional momentum traders sell to individual investors and institutions that are less concerned with holding prudent securities, less well-informed, and not momentum traders in the two years prior to forced CEO turnover. This results in a substantial shift in the ownership structure of these companies prior to forced CEO succession.

Finally, we examine whether the shift in shareholder composition is related to board turnover decisions. We find that the change in institutional ownership in the year prior to turnover is a significant factor in differentiating companies that force CEO succession from companies that experience voluntary CEO turnover or companies in the matched control sample, even after accounting for return differences and other variables previously shown to predict turnover. The likelihood that a CEO is forced from office increases with greater institutional selling of a firm's stock. Further tests suggest that the shift in shareholder composition also influences the CEO replacement decision. A decline in institutional ownership is associated with a significantly greater likelihood that an outsider is appointed to replace a fired CEO. Forced turnovers in which an outsider is appointed CEO have been associated with larger abnormal returns around the announcement (Borokhovich et al., 1996) and better post-turnover operating performance (Huson et al., 2001) than forced turnovers in which an insider is appointed.

The correlation between shifts in ownership structure and board decisions is consistent with the hypothesis that changes in shareholder composition influence the board's decisions. The correlation, of course, does not necessarily imply causation. It is also possible that shifts in ownership structure appear to influence board decisions because they are accompanied by informal communication between some of the institutions that are selling and the board. Such communications can include, for example, a phone call explaining why the institution is selling. Alternatively, the correlation can arise because both the shift in the ownership structure and the decision to fire the CEO are correlated with a third exogenous factor, such as media coverage.

The remainder of the paper is organized as follows. Section 2 discusses factors that influence the choice of activism or selling. Section 3 describes the data and Section 4 examines changes in ownership structure leading up to and following forced CEO. Section 5 examines why some institutions sell shares prior to forced CEO turnover. Next, Section 6 explores the relations between the shift in ownership structure and the board's turnover and CEO replacement decisions. Section 7 concludes.

## **2. Institutional activism versus selling**

Institutions can influence corporate decisions by taking an active role in the decision-making process rather than selling their shares. Shareholders with large equity positions have greater incentives to monitor management than do small, atomistic shareholders because the benefits that large shareholders receive from their monitoring activities are more likely to exceed the costs that they bear (Grossman and Hart, 1980; Shleifer and Vishny, 1986; Huddart, 1993). Moreover, large ownership positions can allow institutions to exert greater influence on corporate decisions.

Evidence indicates some US institutional investors have become active in corporate governance in recent years (see Gillan and Starks (1998) and Karpoff (1999) for surveys of the shareholder activism literature). Beginning in the mid-1980s, for example, some public pension and union funds developed reputations as shareholder activists. To effect changes in corporate governance, these activists typically negotiate with corporate management, publicly target corporations through the media, and present shareholder proposals at corporate annual meetings. In large part, these public pension funds became active due to the substantial proportion of their portfolio that is indexed. For example, in 1997, the largest public pension funds in California, Texas, New York, and Florida had well over 50% of their equity portfolios indexed (Conference Board, 1998). Because they index, these institutions can no longer simply sell their shares when they are unhappy with management's performance.

Beyond public pension and union funds, some private pension fund and mutual fund advisors take an active role in corporate governance, although their activism is less publicized. For instance, some money managers have purportedly influenced high profile decisions to replace top managers (New York Times, August 8, 1993,

p. 15; Pensions and Investments, February 22, 1993, p. 12). Furthermore, in a survey of 231 portfolio managers and institutional shareholders, 77% of the respondents indicate that they had participated in some form of activism in the previous year, either by communicating their opinions directly to a board (verbally or by letter), seeking more involvement in board oversight, sponsoring a shareholder resolution, or voting in favor of one (Felton, 1997).

While there is evidence that institutions take an active role in corporate governance, there is no strong evidence that such activism impacts long-term stock or operating performance (Smith, 1996; Karpoff et al., 1996; Del Guercio and Hawkins, 1999). In addition, there is only limited evidence that institutional activism influences specific corporate decisions (Huson, 1997; Carleton et al., 1998).

Some authors suggest that activism is the exception rather than the rule because institutions generally view liquidity as more important than monitoring (Coffee, 1991; Bhide, 1994). They argue that the concentrated ownership required to make institutional investors more involved in corporate governance has too large a cost in terms of sacrificed liquidity. In fact, Bhide maintains that the liquidity of US markets serves as an impediment to effective corporate governance; that is, it is too easy for institutions to simply sell shares. Moreover, the reduction in trading costs over the last 25 years increases incentives for institutional investors to quickly abandon a stock rather than attempt to point management in a new direction.

Maug (1998), on the other hand, argues that the relation between liquidity and control is theoretically ambiguous. Although it is easier to sell a large ownership position in a more liquid stock market, such markets also make it easier for investors to acquire large positions and thereby profit from their increased monitoring activities. Maug concludes that because liquid stock markets have two opposing effects on corporate governance, which of these effects dominates is an empirical question.

### 3. Data

Our empirical analysis primarily focuses on a sample of CEO turnovers at large public corporations over the 1982 to 1993 period. We focus on large corporations because individual institutions are more likely to have substantial holdings in large firms and because large corporations tend to have high overall levels of institutional ownership. For example, Sias and Starks (1997) report that the cross-sectional correlation between the natural logarithm of firm size and institutional ownership averages 55% over the 1978 to 1992 period. The decision to maintain or change their ownership position in large firms is likely to be a more significant choice for institutions. Also, because the institutions typically hold a large proportion of the shares, a shift in ownership structure is likely to have a meaningful impact on corporate decisions at these firms. To ensure that the sample consists of turnovers at large firms, we begin with a set of 583 CEO turnovers that satisfy the following criteria: (1) the incumbent and successor CEOs are both profiled in *Forbes* annual compensation surveys; (2) the *Wall Street Journal* reports the turnover; (3) Standard

and Poors' Compustat data are available for the firm in the year in which the turnover occurs; and (4) the turnover occurs at a firm that is listed on the New York Stock Exchange (NYSE). We further require that the turnover is not directly related to a takeover.

Each turnover is classified as forced or voluntary. As in Parrino (1997), the classification is based on the following decision process: first, a succession is classified as forced if the *Wall Street Journal* reports that the CEO is fired, forced from the position, or departs due to unspecified policy differences. For the remaining cases, the succession is classified as forced if the departing CEO is under the age of 60 and the *Wall Street Journal* announcement of the succession: (1) does not report the reason for the departure as involving death, poor health, or the acceptance of another position (elsewhere or within the firm) or (2) reports that the CEO is retiring, but does not announce the retirement at least six months prior to the succession. The circumstances surrounding the departures of the second group are further investigated by searching the business and trade press for relevant articles to reduce the likelihood that a turnover is incorrectly classified. These successions are reclassified as voluntary if the incumbent takes a comparable position elsewhere or departs for previously undisclosed personal or business reasons that are unrelated to the firm's activities. Based on this classification scheme, we identify 111 forced and 472 voluntary turnovers.

The set of firms with voluntary CEO turnover serves as one benchmark in our examination of changes in the shareholder ownership structure in the forced turnover sample. In addition, we construct a control sample of firms that are matched to the individual firms in the forced turnover sample on the basis of time, market capitalization, and stock returns. In constructing this control sample, we first identify, for each firm in the forced turnover sample, all NYSE stocks whose market capitalization is between 70% and 130% of the market capitalization of the firm with forced CEO turnover as of the turnover date. From this list of firms, we then choose the firm with a stock return over the year prior to the forced turnover that is the closest in magnitude to the stock return for the firm with forced CEO turnover and in which there has been no CEO turnover in the previous three years. This procedure results in a sample of 109 matching firms. Suitable matching firms are not found in two cases. For the matched control sample firms, the term "CEO turnover date" henceforth refers to the date turnover occurs at the matching forced CEO succession firm.

The matched control sample allows us to compare changes in shareholder ownership structure at firms with similarly poor performance but that appear to differ with respect to the reason for the performance. We assume that the fired CEOs are held accountable for poor performance at firms in the forced succession sample. On the other hand, the CEOs of the matched control sample are not fired and thus appear to bear less of the blame for the poor performance at their firms. It is, of course, possible that managers in the matching control sample are more entrenched than managers in the forced turnover sample. However, as we discuss later, our empirical evidence does not support this interpretation.

We obtain quarterly institutional ownership data from the CDA/Spectrum database of 13F institutional investors for firms in all three samples. All investors with at least \$100 million in equity holdings are required to file 13F forms in which they report their equity holdings to the Securities and Exchange Commission. For each quarter, we compute two measures of the level of institutional ownership: (1) the number of institutional investors holding the firm's stock and (2) the fraction of shares held by institutional investors. Because 13F reporting is aggregated across different units within an institution, the number of institutions reflects the number of unrelated institutions holding the security. In the case of investment companies, for example, 13F reports are aggregated across different funds in a fund family. For instance, the holdings of Fidelity's Magellan and Fidelity's Blue Chip funds are combined and included in the total holdings of Fidelity Management and Research. We also compute the number of institutional investors who hold at least 1% of the firm's shares.

The empirical analysis uses two performance measures. Quarterly stock returns are computed for each sample firm for the 16 quarters around the turnover announcement (eight quarters prior to turnover and eight quarters following turnover) using data from the Center for Research in Security Prices (CRSP). The quarterly returns are market-adjusted using the CRSP equal-weighted NYSE index. Market-adjusted returns for periods longer than one quarter (e.g., the eight quarters prior to turnover) are computed by compounding the quarterly market-adjusted returns. The ratio of accounting earnings before interest and taxes to total assets (EBIT/assets) is used as a measure of accounting performance. This measure is computed using data from the Compustat database over the fiscal year preceding the turnover announcement. The ratio of EBIT/assets is industry-adjusted by subtracting the median value of the corresponding measure for all firms in the primary two-digit SIC industry in which the firm is active at the time of the succession.

Several firm characteristic variables are used in the empirical analysis. We obtain information on CEO age from *Forbes* compensation surveys, *Wall Street Journal* announcements, and proxy statements. The percentage of shares held by the CEO and the identity of each director is obtained from the proxy statement immediately preceding the turnover announcement. A classification scheme similar to those used in other studies (see Weisbach, 1988; Byrd and Hickman, 1992) is used to identify inside, gray, and outside directors. Specifically, directors who are employees of the firm are classified as insiders. Directors who are not employees, but who are former officers, consultants, commercial bankers, investment bankers, lawyers, insurance company executives, or are related to an officer of the firm are classified as grays (potentially affiliated directors). All other non-employee directors are classified as outsiders. We use *Wall Street Journal* announcements, corporate proxy statements, the *Encyclopedia of Corporate Histories*, and articles in the business and trade press to determine whether the CEO is a member of the firm's founding family. Finally, we identify the timing of all dividend cuts during the two years preceding turnover using the CRSP database and the *Daily Stock Price Record*.

#### 4. Institutional ownership around CEO turnover

We begin the empirical analysis with an examination of levels of institutional ownership prior to CEO turnover and changes in these levels before and after turnover.

##### 4.1. Levels of ownership

Panel A in [Table 1](#) reports the mean and median institutional ownership levels for the forced turnover, matched control, and voluntary turnover samples two years prior to the turnover announcement in the *Wall Street Journal*.<sup>2</sup> The fraction of shares held by institutional investors does not differ significantly between the forced and voluntary turnover samples, but firms with forced turnover do tend to have fewer institutional investors than firms with voluntary turnover (the difference is statistically significant at the 1% level). In contrast, two years prior to forced CEO turnover, institutional ownership at firms in the matched control sample is similar to firms in the forced turnover sample in terms of both ownership percentage and number of institutions. There is little difference across the three samples in the number of institutions holding large positions.

Panel A also shows the average market capitalization for each of the three samples. By design, differences between the forced and matching control sample market capitalizations are negligible. Firms in the forced CEO succession sample, however, tend to be smaller than firms in the voluntary CEO succession sample.

The CDA/Spectrum data identify investors as belonging to one of five groups: bank trust departments, insurance companies, investment companies, independent investment advisors, and others. CDA/Spectrum classifies institutions into these categories according to the majority of the institution's assets. Thus, an institution that operates as a mutual fund advisor and as an independent investment advisor is classified as an investment company if CDA estimates that 50% or more of the assets are mutual fund assets. The "other" category consists primarily of foundations, ESOPs, university endowments, and internally managed private and public pension funds.

Panel B in [Table 1](#) reports the mean and median number of each type of institution owning shares in the sample firms and the mean and median fraction of shares held by these institutions two years prior to CEO turnover. Independent investment advisors and bank trust departments are the largest institutional shareholders in these firms. Their combined holdings account for about 70% of the shares held by all institutional investors (73%, 70%, and 70%, respectively, for the forced turnover sample, matched control sample, and voluntary turnover sample). Firms that subsequently experience forced turnover have fewer institutional investors in all

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<sup>2</sup> Because only large institutions (at least \$100 million of equity under management) are required to file 13F forms with the SEC, small institutions and investment partnerships are not included in our analysis. As a result, total institutional ownership in [Table 1](#) is a lower bound. For purposes of our discussion, we define institutional investors as institutions that file 13F forms.

Table 1

Institutional ownership for forced, matched control, and voluntary sample firms two years prior to the CEO turnover. This table reports the mean and median number of institutions holding shares in the corporation, percentage holdings by institutions, number of institutions holding at least 1% of the shares, and market capitalization for firms that experience a forced CEO turnover, a size- and return-matched control sample, and firms that experience a voluntary CEO turnover. The ownership statistics are computed for forced and voluntary CEO turnovers at a point two years before the CEO turnover (i.e., eight quarters before the quarter in which the turnover occurred) and for the matched control firm sample at the same time as their respective forced CEO turnover firm. The number of firms reported for each sample is the number of firms for which institutional ownership data are reported in the CDA/Spectrum database two years before the turnover. Panel B reports institutional holdings by type of institution. The seventh through tenth columns report *t*-statistics for tests of differences in means and *z*-statistics from Wilcoxon rank-sum tests of whether the forced and matched control samples (seventh and eighth columns) or the forced and voluntary turnover samples (ninth and tenth columns) are drawn from the same distribution.

	Forced turnovers			Matched sample			Voluntary turnover			H <sub>0</sub> : Force = Match		H <sub>0</sub> : Force = Voluntary	
	Mean	Median		Mean	Median		Mean	Median		<i>t</i> -statistic	<i>z</i> -statistic	<i>t</i> -statistic	<i>z</i> -statistic
<i>Panel A: All institutions</i>													
No. of institutions	136	93		127	88		180	146		0.53	0.62	-3.04***	-4.09***
Ownership (%)	43.30	45.00		41.40	44.90		45.00	46.80		0.68	0.64	-0.83	-0.66
No. of institutions holding at least 1% of the shares	10.24	10.00		9.88	9.00		10.07	10.00		0.47	0.49	-0.29	0.11
Market cap. (\$000)	2,121,590	724,278		1,995,378	639,888		4,156,708	1,759,091		0.22	0.18	-3.67***	-6.43***
Number of firms	102			101			455						
<i>Panel B: By type of institution</i>													
No. of institutions:													
Bank trust dept.	57	39		51	35		81	66		0.83	0.89	-4.21***	-4.59***
Insurance companies	12	9		11	9		16	13		0.46	0.78	-3.86***	-4.14***
Investment companies	7	4		7	5		10	8		-0.58	-0.69	-4.12***	-4.80***
Independent advisors	48	33		45	29		55	42		0.36	0.44	-1.26	-2.68***
Other institutional	13	9		13	9		18	16		0.45	0.51	-3.10***	-3.60***
Ownership (%):													
Bank trust dept.	12.4	11.1		11.4	11.4		15.0	14.7		0.96	0.54	-3.14***	-3.20***
Insurance companies	4.4	3.6		4.9	3.6		4.7	4.2		-0.80	-0.10	-0.90	-1.53
Investment companies	3.4	2.5		3.6	2.8		3.7	3.1		-0.48	-0.30	-0.88	-1.93*
Independent advisors	19.0	17.7		17.6	16.2		16.3	14.9		0.89	0.98	2.25***	2.19**
Other institutional	4.2	3.2		4.0	3.2		5.2	4.8		0.42	0.57	-2.35**	-2.58***

Table 2

Abnormal returns and changes in total institutional ownership in four years around CEO turnover. For various periods in the four years around CEO turnovers for the samples of forced turnover, their matched control firms, and voluntary turnovers, this table shows the mean market-adjusted compound abnormal returns (Panel A), the mean change in the number of institutional investors (Panel B), and the mean change in percentage ownership by institutional investors (Panel C). The numbers of observations in the period for the forced/matching control/voluntary samples are given in the first row. *T*-statistics provided in the fourth and fifth rows of each panel test the null hypotheses that the forced turnover and matched control firm samples or the forced and voluntary turnover samples have equal means. *T*-statistics reported in parentheses test the null hypothesis that the mean value does not differ from zero. The turnover occurs in quarter  $t = 0$ .

	Quarters (inclusive)										
	Level at $t = 0$										
No. of firms (forced/match/vol.)	-7 thru 0	-7 thru -4	-3 thru -2	-1 thru 0	1 thru 2	3 thru 4	5 thru 8	1 thru 8	1 thru 8	1 thru 8	-7 thru 8
<i>Panel A: Mean market-adjusted compounded abnormal return (%)</i>											
Forced	-30.22 (-8.01)***	-10.77 (-3.30)***	-10.43 (-4.14)***	-15.65 (-5.42)***	-5.30 (-1.92)*	3.59 (0.79)	6.02 (1.13)	8.21 (1.45)	8.21 (1.45)	6.02 (1.13)	-20.41 (-3.51)***
Matched	-31.02 (-9.03)***	-16.28 (-5.66)***	-9.84 (-5.28)***	-10.63 (-5.94)***	-1.30 (-0.55)	-3.21 (-1.48)	3.54 (0.91)	-3.63 (-0.84)	-3.63 (-0.84)	3.54 (0.91)	-31.02 (-6.43)***
Voluntary	-1.67 (-0.95)	-0.43 (-0.34)	-1.60 (-1.94)*	0.23 (0.26)	0.04 (0.04)	0.61 (0.69)	2.02 (1.82)*	2.33 (1.47)	2.33 (1.47)	2.02 (1.82)*	0.53 (0.22)
<i>t</i> -statistic ( $H_0$ : forced = matched)	0.16	1.27	-0.19	-1.48	-1.10	1.35	0.38	1.66*	1.66*	0.38	1.40
<i>t</i> -statistic ( $H_0$ : forced = voluntary)	-6.87***	-2.96***	-3.33***	-5.26***	-1.83*	0.65	0.74	1.00	1.00	0.74	-3.33***

Panel B: Mean change in number of institutional investors

Forced	125 (n = 111)	-6.26 (-1.81)	2.04 (0.81)	-2.90 (-2.04)**	-6.57 (-3.71)***	-1.50 (-0.78)	2.23 (1.08)	14.02 (5.49)***	18.56 (4.33)***	14.21 (2.60)***
Matched	126 (n = 108)	3.01 (0.95)	3.01 (1.22)	0.17 (0.14)	0.18 (0.15)	2.56 (2.00)**	2.10 (1.72)*	7.56 (3.71)***	12.33 (4.21)***	15.62 (3.20)***
Voluntary	197 (n = 469)	20.62 (10.61)***	11.87 (9.59)***	4.89 (6.47)***	4.22 (5.25)***	4.43 (5.43)***	4.35 (5.77)***	9.50 (7.77)***	18.43 (10.48)***	39.36 (13.42)***
t-statistic (H <sub>0</sub> : forced = matched)		-1.98**	-0.28	-1.67*	-3.20***	-1.76*	0.05	1.98**	1.20	-0.19
t-statistic (H <sub>0</sub> : forced = voluntary)		-6.77***	-3.51***	-4.83***	-5.54***	-2.84***	-0.97	1.60	0.03	-4.06***

Panel C: Mean change in percentage institutional ownership (%)

Forced	38.12% (n = 111)	-4.34 (-3.06)***	0.77 (0.83)	-1.83 (-2.47)**	-3.34 (-3.57)***	-0.09 (-0.12)	-0.26 (-0.36)	1.88 (1.91)*	3.73 (2.80)***	1.14 (0.55)
Matched	43.00% (n = 108)	1.77 (1.38)	0.35 (0.35)	0.64 (1.55)	0.78 (1.82)*	1.18 (2.12)**	0.00 (0.01)	2.04 (2.74)***	3.54 (4.12)***	5.61 (3.55)***
Voluntary	47.47% (n = 469)	2.60 (7.11)***	1.45 (5.69)***	0.64 (2.93)***	0.63 (2.72)***	1.14 (4.41)***	0.49 (1.80)*	1.42 (4.57)***	3.27 (7.60)***	5.65 (10.34)***
t-statistic (H <sub>0</sub> : forced = matched)		-3.20***	0.30	-2.91***	-4.00***	-1.38	-0.28	-0.13	0.12	-1.72*
t-statistic (H <sub>0</sub> : forced = voluntary)		-4.74***	-0.71	-3.20***	-4.12***	-1.60	-0.98	0.45	0.33	-2.10**

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

categories than firms that subsequently experience voluntary turnovers. The same is true for the fraction of shares held by each investor group, except for independent investment advisors who have larger holdings in the firms where forced turnover is subsequently observed. Differences in the ownerships across the institutional investor types between the forced turnover and matched control firm samples are small and never statistically significant at traditional levels.

#### 4.2. Changes in aggregate institutional ownership

We begin our examination of changes in ownership structure by computing changes in the total number of institutional investors and changes in the fraction of shares held. We compute these changes for the four years surrounding CEO succession, including two years prior to turnover and two years following turnover. Quarter 0 is defined as the quarter in which the CEO succession is announced in the *Wall Street Journal*.

Panel A of Table 2 reports the mean market-adjusted stock returns for the forced turnover, matched control, and voluntary turnover samples and *t*-statistics (in parentheses) for tests of the null hypothesis that mean values equal zero. In addition, the last two rows of Panel A report *t*-statistics for tests that the mean values are equal for the forced and matched control samples and for the forced and voluntary turnover samples, respectively. The mean values include returns for all firms for which both institutional ownership data and returns are available during the indicated period. The number of firms that meet these criteria for each period and group is listed in the first row of each column, with the number of forced turnovers listed first, matched control firms listed second, and voluntary turnovers listed third.

In the two years prior to a forced CEO turnover, firms experience large negative market-adjusted returns of  $-30.22\%$ , on average. This result is consistent with studies showing poor performance as a predictor of forced CEO turnover (e.g., Warner et al., 1988). The forced CEO turnover firms continue to exhibit below market returns, on average, in the two quarters following turnover (statistically significant at the 10% level). From seven to 24 months following forced turnover (i.e., quarters 3–8), the returns for these firms do not differ significantly from market returns.

By design, the matched control firms have a similar return pattern through the turnover quarter, with no significant differences between the two samples in the pre-turnover period. For quarters 1 through 8, however, we find marginally significant evidence that the forced turnover firms perform better than their matched counterparts. In contrast to both of these groups, stock returns at firms that experience voluntary turnover are similar to market averages throughout the four-year period. The *t*-statistics for the tests of differences in the mean returns between the forced and voluntary samples are statistically significant at the 5% level or better in the pre-turnover period only.

Panel B in Table 2 reports the change in the number of institutional investors for firms in the three samples. Although voluntary turnover firms exhibit significant increases in the number of institutional investors throughout the four-year period, the forced turnover and matching control firms do not show significant increases

during the pre-turnover period. In fact, forced turnover firms lose institutional investors in the year prior to turnover and this loss of institutions differs significantly from the changes in the number of institutional investors in both the matching control and voluntary turnover samples. While there is an average *increase* of about 9.11 institutional investors in the year prior to the turnover ( $4.89 + 4.22$ ) at firms with voluntary turnover and virtually no change in the number of institutional investors at firms in the matched control sample ( $0.17 + 0.18$ ), firms in the forced CEO succession sample suffer an average *loss* of about 9.47 institutional investors in the year prior to turnover ( $-2.90 + -6.57$ ). In the two years prior to turnover, changes in the number of institutional investors at the forced CEO succession firms are significantly smaller than changes in the number of institutional investors in the matched control or voluntary CEO succession samples at the 5% level or better.

Firms with forced turnover experience significant gains in the number of institutional investors beginning in the second year following turnover (quarters 5–8), while their matched counterparts show significant gains beginning a year earlier. The total increase in the number of institutional investors in the two years following turnover is similar for both the forced and voluntary CEO turnover samples with a net gain of about 18.5 institutions. Although the average gain of 12.3 institutions is smaller for the matched control sample, the difference is not statistically significant.

Panel C in Table 2 reports the average change in the fraction of shares held by institutional investors in the four years around CEO turnover. Consistent with the changes in the number of institutions, there is a decline in average fractional institutional ownership during the two years prior to forced turnover. On average, 4.34% of the shares move from large institutional shareholders to individual and other investors during this period. This entire decline occurs in the year prior to turnover. In contrast, fractional institutional ownership does not significantly change for the matched control firms and significantly increases at firms that subsequently experience voluntary turnover. In the two years prior to the turnover date, changes in the fraction of shares held by institutional investors at forced CEO succession firms are significantly smaller than changes in the matched control or voluntary CEO succession samples at the 1% level or better. In the two years following the turnover announcement date, all three samples exhibit positive changes in fractional institutional ownership.

## 5. Why some institutions sell

The results in the previous section reveal that firms experience average declines of about 7% in the number of institutional shareholders and 12% in the fraction of shares held by institutional investors in the year immediately before forced turnover.<sup>3</sup> The institutional exodus, however, is not universal. Companies still

<sup>3</sup>The decline in the number of institutional investors is estimated as  $(-6.57-2.90)/(6.57+2.90+125)$ . The decline in the fraction of the institutionally held shares is estimated as  $(-3.34-1.83)/(3.34+1.83+38.12)$ .

average 125 institutional investors holding over 38% of their shares at the time of forced CEO turnover. In fact, as noted in the introduction, of the 19,104 institutional investor-company observations for the forced turnover sample, 10,401 (54.44%) institutional investor positions are reduced or eliminated and 8,624 (45.14%) institutional investor positions are initiated or increased. Thus, in the two years prior to forced CEO succession there is a substantial shift in shareholder composition away from one group of institutional investors toward individual investors and another group of institutional investors.

In this section we examine why some institutional investors sell shares prior to forced CEO succession. Specifically, we focus on the four potential explanations for institutional selling described in the introduction: (H1) momentum trading, (H2) the desire to hold more prudent securities, (H3) informational advantages, and (H4) the belief that the firm's governance structure makes change unlikely.

### *5.1. Returns, momentum trading, and changes in ownership structure*

Recent research (e.g., [Nofsinger and Sias, 1999](#); [Wermers, 1999](#)) finds a positive relation between changes in institutional ownership and returns over the same period. This can result from institutional positive feedback trading and/or because trading by institutional investors drives returns. Because the forced turnover sample experiences negative market-adjusted returns in the two years prior to the turnover, the observed shift in ownership structure may be driven by those institutions that engage in momentum trading.

The results for the matched control sample reported in [Table 2](#), however, fail to support H1, which states that momentum trading by some institutions fully explains the change in ownership structure. Specifically, the matched control firms have similar performance (as well as institutional ownership and size, from [Table 1](#)), yet experience significantly less institutional selling than firms that subsequently experience forced CEO succession. The key difference between the forced CEO succession sample and the matched control sample is that while the poor stock performance for firms in the forced turnover sample is clearly being blamed on management, managers in the matched control sample do not appear to be blamed to the same extent.

As noted previously, it is also possible that managers in the matched control sample are “more entrenched” than managers in the fired CEO sample. If CEOs at matched control sample firms are more entrenched, then institutional investors should abandon the matched control sample firms to a greater extent than the forced CEO turnover firms. Alternatively, if managers in the control sample are not as responsible for poor performance as managers in the forced CEO turnover sample, and institutions abandon stocks when they are unhappy with management, then institutional investors will abandon the forced CEO turnover firms to a greater extent than the matched control sample firms. The empirical results support the latter interpretation.

As a second test of whether the positive cross-sectional relation between changes in institutional ownership and returns can explain why some institutions sell, we

compute abnormal changes in institutional ownership to control for institutional ownership trends and the positive relation between changes in institutional ownership and returns that complicate the interpretation of the evidence in [Table 2](#). We want to control for general ownership trends because [Gompers and Metrick \(2001\)](#) show increases in the number of institutional investors and their fractional ownership of public equity over our sample period.

To test whether the change in shareholder composition prior to forced CEO turnover is driven by some institutions engaging in momentum trading while accounting for the general trends in institutional ownership, we estimate measures of the abnormal change in institutional ownership for each firm-quarter, using all NYSE firms in the CRSP database for that quarter as the benchmark. Specifically, for each quarter in our sample period, we estimate two cross-sectional regressions: (1) the change in the number of institutions on the contemporaneous quarterly return and (2) the change in the fraction of shares held by institutional investors on the contemporaneous quarterly return.<sup>4</sup> The regression intercepts capture general increases in the level of institutional ownership and the number of firms filing 13F forms, while the slope coefficients capture the positive relation between quarterly changes in institutional ownership and contemporaneous quarterly returns. The time-series average coefficients and associated *t*-statistics (computed from time-series standard errors) of the 68 quarterly cross-sectional regressions are reported in Panel A of [Table 3](#). Consistent with previous studies, we find a strong positive relation between quarterly changes in institutional ownership and returns over the same quarter.

For each of our observations, for each quarter from quarter -7–8, we then estimate the residual from the appropriate regression model. These residuals serve as our estimates of the quarterly abnormal change in institutional ownership (i.e., adjusted for general increases in institutional ownership and returns). We sum these residuals over quarters to calculate longer-term (i.e., semi-annual, annual, and two-year) abnormal changes in institutional ownership for individual firms.

Panels B and C in [Table 3](#) report the mean residuals from these regressions for firms in the forced turnover, matching control, and voluntary turnover samples. The evidence in Panels B and C indicates that the abnormal changes in ownership are very similar to the raw changes shown in Panels B and C of [Table 2](#). Differences in abnormal changes in institutional ownership between the forced CEO succession sample and the matched control or voluntary CEO succession sample are also similar and remain statistically significant. Firms in the forced turnover sample experience an abnormal decline in the number and percentage ownership of institutional investors in the year preceding the turnover. In the second year following forced turnover, these firms experience abnormal increases in the number of institutional investors, but no abnormal increases in the percentage of shares held by institutions.

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<sup>4</sup>Closed-end funds, REITS, primes and scores, and foreign companies are excluded from the analysis. An average of 1,469 securities are used in each cross-sectional regression.

Table 3

Abnormal changes in institutional ownership in four years around CEO turnover

For each quarter between 1980 and 1996 (inclusive), we compute the abnormal change in the number of institutional investors for each NYSE security as the residual in a cross-sectional regression of the change in the number of institutions holding shares in the security over the quarter on the return over the quarter. Similarly, we compute the abnormal change in the fraction of shares held by institutional investors by replacing the dependent variable with the change in the fraction of shares held by institutional investors over the quarter. The results of these 68 cross-sectional regressions are summarized in Panel A (on average each regression contains 1,469 securities). The *t*-statistics in Panel A are computed from time-series standard errors. Panels B and C report, for various periods in the four years around CEO turnovers, for the samples of forced turnovers, their matched control firms, and voluntary turnovers, the mean abnormal change in the number of institutional investors (Panel B) and abnormal change in the fraction of shares held by institutional investors (Panel C). Abnormal changes in institutional ownership over multiple quarters are computed as the sum of the residuals over the quarters. The numbers of observations in the period for the forced/matching control/voluntary samples are given in the first row of Panel B. *T*-statistics provided in the last two rows of Panels B and C test the null hypothesis that the forced turnover and matched control firm samples or the forced and voluntary turnover samples have equal means. *T*-statistics reported in parentheses test the null hypothesis that the mean value does not differ from zero. The turnover occurs in quarter *t* = 0.

*Panel A: Regression summary—Abnormal change in institutional ownership*,  $\alpha_t + \beta_t(\text{return}_{i,t}) + \varepsilon_{i,t}$

Dependent variable	Average intercept ( <i>t</i> -statistic)	Average slope coefficient ( <i>t</i> -statistic)	Average R <sup>2</sup>
Change in No. of institutional investors	0.9450 (6.03)***	12.0361 (24.24)***	7.33%
Change in % institutional ownership	0.0022 (5.09)***	0.0298 (10.70)***	1.81%

  

	Quarters (inclusive)								
	-7 thru 0	-7 thru -4	-3 thru -2	-1 thru 0	1 thru 2	3 thru 4	5 thru 8	1 thru 8	-7 thru 8
No. of firms (forced/match/vol.)	102/101/ 455	103/101/ 458	111/107/ 467	110/108/ 467	105/108/ 468	101/109/ 466	92/108/ 451	87/107/ 450	80/100/ 436

  

*Panel B: Mean abnormal change in number of institutional investors*

	-7 thru 0	-7 thru -4	-3 thru -2	-1 thru 0	1 thru 2	3 thru 4	5 thru 8	1 thru 8	-7 thru 8
Forced turnover	-12.96 (-4.21)***	-2.56 (-1.12)	-4.21 (-3.37)***	-7.02 (-4.47)***	-3.55 (-1.98)**	-0.30 (-0.16)	7.59 (3.31)***	6.18 (1.60)	-6.30 (-1.31)
Matched sample	-3.48 (-1.27)	-0.96 (-0.43)	-1.25 (-1.20)	-0.93 (-0.94)	-0.22 (-0.18)	-0.44 (-0.41)	1.46 (0.77)	0.88 (0.33)	-2.47 (-0.57)

Voluntary turnover	8.79 (4.91)***	5.91 (5.21)**	2.10 (3.04)**	1.11 (1.51)	1.65 (2.20)**	1.43 (2.12)**	3.79 (3.36)**	7.05 (4.41)***	16.02 (5.93)***
<i>t</i> -statistic ( $H_0$ : forced = matched)	-2.30**	-0.50	-1.82*	-3.29***	-1.54	0.07	2.05**	1.13	-0.59
<i>t</i> -statistic ( $H_0$ : forced = voluntary)	-6.11***	-3.33***	-4.42***	-4.68***	-2.68***	-0.86	1.48	-0.21	-4.03***
<i>Panel C: Mean abnormal change in percentage institutional ownership (%)</i>									
Forced turnover	-6.06 (-4.53)***	-0.50 (-0.56)	-2.13 (-3.12)***	-3.39 (-3.83)***	-0.61 (-0.87)	-0.89 (-1.31)	0.45 (0.48)	0.70 (0.58)	-4.02 (-2.08)**
Matched sample	0.09 (0.08)	-0.67 (-0.70)	0.28 (0.69)	0.52 (1.29)	0.38 (0.71)	-0.63 (-1.11)	0.69 (0.96)	0.74 (0.87)	1.05 (0.71)
Voluntary turnover	-0.19 (-0.54)	0.06 (0.24)	-0.01 (-0.04)	-0.15 (-0.65)	0.41 (1.69)*	-0.16 (-0.61)	0.23 (0.75)	0.71 (1.74)*	0.29 (0.55)
<i>t</i> -statistic ( $H_0$ : forced = matched)	-3.44***	0.13	-3.04***	-4.02***	-1.12	-0.29	-0.20	-0.02	-2.08**
<i>t</i> -statistic ( $H_0$ : forced = voluntary)	-4.25***	-0.61	-2.97***	-3.55***	-1.38	-1.00	0.22	-0.01	-2.15**

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

Comparing Panel C of Table 3 to Panel C of Table 2 reveals that the average abnormal decline in fractional institutional ownership during the two years prior to turnover ( $-6.06\%$ ) is greater than the average raw decline in institutional ownership ( $-4.34\%$ ) for firms in the forced turnover sample. Similarly, the abnormal decline in the number of institutional investors in the two years prior to turnover ( $-12.96$ ) is greater than the raw decline ( $-6.26$ ). These differences indicate that the general increase in institutional ownership is greater than the effect of the positive relation between returns and changes in institutional ownership. That is, on average, for firms in the forced turnover sample, the positive intercept term is larger (in absolute value) than the product of the firms' returns and the estimated coefficient associated with quarterly returns.

In sum, some institutional investors reduce their positions prior to forced CEO turnover because these securities suffer from poor performance and these investors engage in momentum trading (i.e., Table 3, Panel A). Nonetheless, based on the analysis of abnormal changes in institutional ownership and the differences between forced CEO succession firms and the matching control firms, we conclude that institutional momentum trading (H1) does not fully explain the change in shareholder composition.

### 5.2. Window-dressing and changes in institutional ownership

“Window-dressing” refers to the alleged practice of some institutional investors selling stocks that performed poorly prior to reporting dates to present “respectable” portfolios to sponsors. This behavior can be viewed as a special case of momentum trading motivated by an agency problem. Although extant evidence of systematic window-dressing is scant, that evidence is limited to the end of the calendar year (see Lakonishok et al., 1991; Sias and Starks, 1997; Musto, 1997). Thus, if the change in ownership structure is driven by window-dressing, we expect that institutional investors will sell shares of forced CEO turnover firms with greater vigor in the fourth quarter of each calendar year than in the first three quarters of the year. Therefore, to test whether window-dressing helps explain why some institutional investors sell these securities, we examine abnormal returns and the four measures of changes in institutional ownership (raw and abnormal changes in fractional ownership and number of institutional investors) in the year prior to forced turnover, partitioning the sample into fourth-quarter observations and observations from the first three calendar quarters. This analysis, the details of which are not reported to conserve space, reveals no significant difference across the quarters in the year prior to turnover, suggesting that window-dressing is not a major factor behind the shift in shareholder composition prior to forced turnover.

### 5.3. Dividend cuts or eliminations

The desire to avoid imprudent securities (H2) is a second reason some institutional investors may abandon shares of firms with forced CEO succession (Badrinath et al., 1989; Del Guercio, 1996; Falkenstein, 1996; Bennett et al., 2002). For example, some

institutions operate under investment policies that restrict their ability to invest in shares of firms that do not pay dividends or cut their dividends. To investigate whether the observed decline in institutional ownership for the firms in the forced turnover sample is due to cuts or the elimination of dividends at those firms, we identified all dividend cuts during the year preceding turnover at the sample firms. Not surprisingly, given their general poor performance, proportionately more dividend cuts occurred at firms with forced turnovers than at firms with voluntary turnovers. Specifically, 28 of the 111 (25.2%) forced turnover firms announce at least one dividend cut during the year preceding the turnover announcement, and 18 of these firms completely eliminate dividends. In contrast, only 29 of the 465 (6.2%) voluntary turnover firms announce at least one dividend cut during the year preceding the turnover announcement and only nine eliminate dividends altogether. The difference in proportions of firms that cut dividends and the proportions of firms that eliminate dividends altogether across the forced and voluntary turnover samples are both statistically significant at the 1% level. Furthermore, despite their similarity in performance, only seven of 107 (6.5%) matched control sample firms cut dividends and only two (1.9%) terminate them in the year prior to the turnover date.

To examine whether institutions sell shares in response to dividend cuts, for each sample we compare aggregate changes in institutional ownership over the year preceding turnover 1) at firms that cut or eliminate dividends with those that do not cut dividends and 2) at firms that eliminate dividends with those that do not cut dividends. The results of this analysis are presented in Table 4. Panel A of Table 4 shows the average market-adjusted return for each sample, partitioned into three groups, including (1) firms that do not cut dividends, (2) firms that cut *or* eliminate dividends, and (3) firms that eliminate dividends in the year preceding CEO turnover. The last two columns report the results of a *t*-test for difference in means of the null hypothesis that the mean for the no-dividend-cut group equals the mean for the dividend-cut or elimination group (fourth column) or that the mean for the no-dividend-cut group equals the mean for the dividend-elimination group (fifth column). For the forced and voluntary samples, those firms that cut dividends or that eliminate dividends altogether had significantly worse performance than firms that did not cut dividends. This was not the case for the matched control firm sample, although the small number of firms in this group that cut or eliminate dividends makes it difficult to draw meaningful conclusions.

The raw and abnormal changes in fractional institutional ownership and number of institutional shareholders during the year preceding turnover are reported in Panels B through E of Table 4. The evidence in these panels indicates that firms in the forced turnover sample generally experience greater declines in fractional institutional ownership than firms in the voluntary sample regardless of whether or not they cut or eliminate dividends altogether (last row in Panels C and E). Similarly, when we limit the sample to those firms that do not cut dividends, firms in the forced turnover sample experience a significantly greater decline in the number of institutional investors than firms in the voluntary turnover sample (last row in Panels B and D). Significant differences in the changes in fractional institutional

Table 4

Institutional ownership changes in the year preceding CEO turnover partitioned by dividend cuts and eliminations. This table shows the mean market-adjusted stock return and change in institutional ownership during the year preceding turnover for the forced, matched control, and voluntary turnover samples partitioned according to whether dividends are cut or eliminated during the year preceding turnover. The statistics are for samples of 110 forced turnovers, 107 matched control firms, and 465 voluntary turnovers. Twenty-eight of the forced turnover firms (10 dividend cuts, 18 dividend eliminations), seven of the matched control firms (5 dividend cuts, 2 dividend eliminations), and 29 of the voluntary turnover firms (20 dividend cuts, 9 dividend eliminations) cut or eliminated their dividends in the year preceding turnover. The first column reports the averages for those firms in each sample that did not cut or eliminate dividends. The second column reports the averages for those firms that reduced or eliminated their dividends. The third column reports the averages for those firms that eliminated their dividends.  $T$ -statistics for tests that the average values equal zero are provided in parentheses.  $T$ -statistics provided in the fourth and fifth row of each panel test the null hypothesis that the forced turnover and matched control firm samples or the forced and voluntary turnover samples have equal means.  $T$ -statistics provided in the last two columns test the null hypothesis that firms with and without dividend cuts (i.e., first and second columns) or firms without dividend cuts and firms that eliminate their dividends (i.e., first and third columns) exhibit equal means.

	No dividend cut or elimination ( $n = 82/100/436$ )	Dividend cut or elimination ( $n = 28/7/29$ )	Dividend elimination ( $n = 18/2/9$ )	$t$ -statistic ( $H_0$ : No cut = cut or elimination)	$t$ -statistic ( $H_0$ : No cut = elimination)
<i>Panel A: Average market-adjusted return</i>					
Forced turnover	-13.73 (-3.90)***	-48.73 (-7.52)***	-56.70 (-7.36)***	4.74***	5.07***
Matched sample	-18.52 (-7.59)***	-22.80 (-1.80)	-32.04 (-1.29)	0.33	0.54
Voluntary turnover	0.05 (0.04)	-20.98 (-4.89)***	-25.15 (-4.19)***	4.69***	4.11***
$t$ -statistic ( $H_0$ : forced = matched)	-1.12	1.82	0.95		
$t$ -statistic ( $H_0$ : forced = voluntary)	3.68***	3.57***	3.23***		
<i>Panel B: Average change in number of institutional owners</i>					
Forced turnover	-3.05 (-1.25)	-28.04 (-4.86)***	-25.83 (-3.88)***	3.99***	3.22***
Matched sample	1.79 (2.76)***	-3.84 (-0.88)	-10.00 (-1.25)	1.28	1.32
Voluntary turnover	10.77 (8.69)***	-15.66 (-4.61)***	-11.67 (-4.04)***	7.31***	7.14***

*t*-statistic ( $H_0$ : forced = matched) 3.22\*\*\* 1.60 1.52  
*t*-statistic ( $H_0$ : forced = voluntary) 5.08\*\*\* 1.85 1.95\*

*Panel C: Average change in percentage total institutional ownership (%)*  
 Forced turnover -2.80 -12.13 -15.93 3.02\*\*\* 3.28\*\*\*  
 (-2.20)\*\* (-4.30)\*\*\* (-4.20)\*\*\*  
 Matched sample 1.79 -3.84 1.32 1.28 0.05  
 (2.76)\*\*\* (-0.88) (0.15)  
 Voluntary turnover 1.16 2.66 6.14 -0.99 -2.32\*\*  
 (3.83)\*\*\* (1.80)\* (2.89)\*\*\*  
*t*-statistic ( $H_0$ : forced = matched) 3.22\*\*\* 1.60 1.80  
*t*-statistic ( $H_0$ : forced = voluntary) 3.03\*\*\* 4.04\*\* 5.08\*\*\*

*Panel D: Average abnormal change in number of institutional owners*  
 Forced turnover -6.89 -23.70 -19.39 3.05\*\*\* 2.06\*  
 (-3.20)\*\*\* (-4.68)\*\*\* (-3.42)\*\*\*  
 Matched sample -1.75 -7.97 -13.13 0.72 2.57  
 (-1.07) (-0.95) (-3.19)\*\*\*  
 Voluntary turnover 4.68 -18.87 -14.40 6.81\*\*\* 5.76\*\*\*  
 (4.09)\*\*\* (-5.79)\*\*\* (-4.63)\*\*\*  
*t*-statistic ( $H_0$ : forced = matched) 1.90\* 1.60 0.90  
*t*-statistic ( $H_0$ : forced = voluntary) 4.74\*\*\* 0.80 0.77

*Panel E: Average abnormal change in percent institutional ownership (%)*  
 Forced turnover -3.72 -10.79 -13.88 2.60\*\* 2.84\*\*\*  
 (-3.08)\*\*\* (-4.42)\*\*\* (-4.12)\*\*\*  
 Matched sample 1.17 -4.53 -1.43 1.51 0.29  
 (1.92)\* (-1.22) (-0.16)\*  
 Voluntary turnover -0.29 1.46 4.52 -1.31 -2.51\*\*  
 (-0.99) (1.12) (2.39)\*\*  
*t*-statistic ( $H_0$ : forced = matched) 3.62\*\*\* 1.41 1.30  
*t*-statistic ( $H_0$ : forced = voluntary) 2.77\*\*\* 4.42\*\*\* 4.76\*\*\*

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

ownership or number of institutional investors between the forced turnover sample and the matched control firm sample are only observed in the no-dividend-cut subsamples. This is not surprising given the lack of power associated with so few matched control sample dividend-cutting firms.<sup>5</sup>

We conclude from the evidence in Table 4 that some institutional investors reduce their holdings when firms cut or eliminate dividends. The higher rate of dividend cuts and eliminations in the sample of forced turnovers suggests this explains some of the shift in the ownership structure. In other words, those institutions most concerned with holding prudent securities are moving away from these stocks. Dividend cuts by themselves, however, do not fully explain the change in shareholder composition at firms with forced turnover. Specifically, institutional ownership declines more at firms with forced turnover regardless of changes in their dividend policies.

#### 5.4. Changes in return volatility

Clayton et al. (2001) find increases in stock price volatility around the time of a forced CEO turnover. If some institutional investors prefer prudent stocks, increases in return volatility for shares in the forced turnover sample could help explain the change in ownership structure. To examine this possibility, we compute the standard deviation of daily returns for each firm-quarter. Table 5 reports the cross-sectional average return volatility for firms in each sample for each quarter in the four years around turnover. Consistent with the prudence explanation, the stock return volatility for forced CEO turnover firm shares increases as turnover approaches and remains higher than the volatility of voluntary turnover sample firm shares following turnover. The difference is statistically significant at the 1% level in every quarter. The average return volatility for firms in the forced turnover sample is also greater than that for firms in the matching control sample during the year leading up to (i.e., quarters –3–0) and the year following (i.e., quarters 1–4) turnover. However, the difference between the forced turnover and matching control samples is statistically significant at the 5% level or better only in the quarter in which turnover is announced and in the second quarter following the announcement.

The results in Table 5 provide mixed support for the prudence explanation (H2). Comparing the forced and voluntary turnover samples suggests that increased risk explains why some institutions sell securities in the forced turnover sample. However, following forced turnover, the change in ownership structure stabilizes even though return volatility remains high (on average, return volatility is higher in the year following CEO succession than the year prior to CEO succession). This is inconsistent with the prudence explanation. In addition, no support for the prudence explanation is found from a comparison of the forced and matched control sample

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<sup>5</sup>In unreported results, we compare market-adjusted returns and changes in institutional ownership between firms that cut, but do not eliminate dividends, and firms that eliminate dividends. We find no statistically significant differences in abnormal returns or changes in the number of institutional investors. We do find a significantly larger reduction in percentage institutional ownership when firms eliminate dividends for the forced CEO turnover sample.

Table 5

Comparison of return volatilities in four years around CEO turnover

For each quarter in the four years around CEO turnover for the samples of forced turnovers, their matched control firms, and voluntary turnovers, this table shows the cross-sectional average standard deviation of daily returns (in percent). The numbers of observations in the period for the forced/matching/voluntary samples for each quarter are given in parentheses in the first column. *T*-statistics provided in the fourth and fifth columns test the null hypothesis that the forced turnover and matched firm samples or the forced and voluntary turnover samples have equal means, respectively. The turnover occurs in quarter  $t=0$ .

Quarter ( <i>n/n/n</i> )	Forced turnovers	Matched sample	Voluntary turnovers	<i>t</i> -statistic $H_0$ : force = match	<i>t</i> -statistic $H_0$ : force = vol.
$t = -7$ (103/101/458)	2.09	2.33	1.78	-1.65	2.88***
$t = -6$ (103/101/458)	2.08	2.27	1.78	-1.28	3.06***
$t = -5$ (103/101/458)	2.19	2.31	1.80	-0.69	3.47***
$t = -4$ (103/101/458)	2.21	2.28	1.85	-0.45	2.98***
$t = -3$ (111/107/467)	2.37	2.17	1.90	1.34	3.80***
$t = -2$ (111/107/467)	2.56	2.37	1.94	0.90	4.24***
$t = -1$ (110/108/467)	2.89	2.47	1.90	1.91*	5.72***
$t = 0$ (110/108/467)	3.28	2.48	1.90	3.15***	6.24***
$t = 1$ (105/108/468)	2.98	2.60	1.87	1.41	4.84***
$t = 2$ (105/108/468)	3.41	2.69	1.89	2.22**	5.48***
$t = 3$ (101/109/466)	3.19	2.54	1.91	1.77*	3.88***
$t = 4$ (101/109/466)	3.04	2.49	1.85	1.55	3.86***
$t = 5$ (92/108/451)	2.58	2.36	1.74	0.94	4.37***
$t = 6$ (92/108/451)	2.59	2.49	1.78	0.38	3.81***
$t = 7$ (92/108/451)	2.60	2.63	1.75	-0.08	3.75***
$t = 8$ (92/108/451)	2.60	2.43	1.75	0.63	3.82***

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

results. Although volatility differences in the pre-turnover period are not substantially different for these two samples, changes in ownership structure are (see Tables 2 and 3).

### 5.5. Changes in institutional ownership by investor type

Existing studies report two interesting characteristics of different classes of institutional investors. First, Del Guercio (1996) and Bennett et al. (2002) find that bank holding companies hold more prudent portfolios than do other institutional investors. Second, Jones et al. (1999) and Sias et al. (2001) report that independent investment advisors appear to be the best-informed institutional investors.<sup>6</sup> An examination of the relation between institutional selling by investor type provides tests of both the prudence and informational advantage explanations for the shift in the ownership structure. If some institutional investors sell shares in firms with forced CEO turnover because they prefer to hold prudent securities, then bank

<sup>6</sup>These studies find that changes in ownership by independent investment advisors exhibit the strongest correlation with future returns. In unreported results, we also find that changes in independent investment advisor ownership are more strongly correlated with future returns than changes in ownership by any of the other investor types.

holding companies should sell shares to a greater extent than other types of institutional investors. In addition, the fact that some institutions are abandoning stocks of firms with forced CEO turnover during the pre-turnover period, when these stocks have large negative abnormal returns, is consistent with H3, which states that these institutional investors are better informed than other investors. If the shift in shareholder composition occurs because some institutional investors are better informed than other investors, then the group of institutional investors most likely to be informed (independent investment advisors) should sell shares to a greater extent than other types of institutions.

Table 6 partitions the changes in institutional ownership for the forced CEO turnover sample by type of institution. Panel A reports changes in the number of institutional investors and Panel B reports changes in the fraction of shares held by institutional investors. For comparison purposes, the first column in Table 6 reports the mean number of each investor type that holds shares in the sample firms (Panel A) and their percentage holdings (Panel B) at the time of the turnover announcement. As expected, given the evidence in Table 2, the number of institutions owning shares and fractional institutional holdings at the time of the forced turnover are smaller than those two years earlier (reported in the first column of Panel B in Table 1). In fact, over the two years preceding forced turnover, the number of institutions and the fraction of shares held by institutions declines for each investor type with the sole exception of the “other” category.

The evidence also reveals differences across institutional investor type in both the timing and magnitude of the changes in their stock ownership. Panel A of Table 6 reveals that a relatively large number of bank trust departments completely eliminate their positions in firms with forced CEO turnover. Furthermore, Panel B shows that bank trust departments are, on average, net sellers throughout the two-year period preceding forced turnover and that they account for the largest overall fraction of the total decline in the fraction of shares held by institutional investors during this period. In the two years prior to turnover, banks account for 44.9% of the decline in fractional institutional holdings ( $-1.95$  in Panel B of Table 6 divided by  $-4.34$  in Panel C of Table 2). During the year prior to turnover, as a fraction of their initial ownership, bank trust departments account for the largest decline in the number of institutional investors ( $(-2.91-1.91)/(2.91+1.91+49.47)=-8.9\%$ ) and the second largest decline in the fraction of shares ( $(-1.07-0.55)/(1.07+0.55+10.17)=-13.7\%$ ). In addition, following the forced CEO succession, bank trust departments are the only investor class that continues to significantly abandon the stocks.

Independent investment advisors are also big sellers in the year prior to forced CEO turnover. While they only exhibit the third largest decline in the number of shareholders as a fraction of their initial ownership ( $(-2.34-0.91)/(2.34+0.91+46.01)=-6.6\%$ ), independent investment advisors exhibit the greatest percentage decline in ownership ( $(-1.84-1.14)/(1.84+1.14+17.45)=-14.6\%$ ) during the year prior to turnover. Moreover, they account for 57.6% ( $(-1.14-1.84)/(-1.83-3.34)$  from Tables 2 and 6) of the overall decline in the fraction of shares held by institutional investors during the year leading up to forced turnover.

Table 6

Changes in institutional investor holdings by investor type in four years around forced CEO turnovers  
 For various periods in the four years around forced CEO turnovers, this table shows the mean change in the number of institutional investors (Panel A) and the mean change in institutional investors' percentage ownership (Panel B) by institutional investor type. The first column reports the level of institutional ownership (by class) at the time of turnover (quarter  $t=0$ ).  $T$ -statistics reported in parentheses test the null hypothesis that the mean value does not differ from zero.

Level at $t=0$	Quarters (inclusive)								
	-7 thru 0	-7 thru -4	-3 thru -2	-1 thru 0	1 thru 2	3 thru 4	5 thru 8	1 thru 8	-7 thru 8
<i>Panel A: Mean change in number of institutional investors</i>									
49.47	-5.19 (-3.94)**	-0.80 (-0.80)	-1.91 (-3.52)**	-2.91 (-4.47)**	-2.81 (-3.41)**	-0.45 (-0.60)	1.48 (1.88)*	-0.63 (-0.41)	-4.91 (-2.29)**
10.52	-0.65 (-1.81)	-0.50 (-1.60)	0.18 (0.81)	-0.39 (-1.79)	0.00 (0.00)	0.50 (1.85)*	1.36 (4.39)**	2.17 (5.48)**	1.76 (3.43)**
6.01	-0.35 (-1.19)	0.09 (0.35)	-0.07 (-0.34)	-0.40* (-2.16)*	-0.02 (-0.08)	0.62 (2.86)**	1.62 (4.19)**	2.48 (5.15)**	2.48 (4.51)**
46.01	-0.14 (-0.08)	2.52 (2.15)**	-0.91 (-1.26)	-2.34 (-2.69)**	1.08 (1.11)	1.25 (1.18)	8.84 (5.99)**	13.32 (5.89)**	13.83 (4.85)**
12.97	0.06 (0.12)	0.72 (1.91)*	-0.20 (-0.87)	-0.54 (-2.14)*	0.11 (0.54)	0.15 (0.51)	0.62 (2.08)**	0.99 (2.21)**	1.08 (1.51)
<i>Panel B: Mean change in percentage institutional investor ownership (%)</i>									
10.17%	-1.95 (-3.97)**	-0.30 (-0.83)	-0.55 (-2.24)**	-1.07 (-3.66)**	-0.54 (-2.22)**	-0.37 (-1.71)*	0.29 (0.94)	-0.28 (-0.63)	-1.83 (-2.50)**
3.34%	-0.87 (-2.57)**	-0.66 (-2.33)**	-0.04 (-0.30)	-0.16 (-0.81)	0.10 (0.54)	-0.05 (-0.35)	0.36 (1.04)	0.67 (1.65)	-0.23 (-0.39)
2.84%	-0.65 (-2.17)**	-0.33 (-1.32)	0.09 (0.48)	-0.28 (-1.35)	0.02 (0.07)	0.62 (3.06)**	0.70 (1.59)	1.48 (3.79)**	1.19 (2.44)**
17.45%	-1.13 (-1.14)	1.71 (2.70)**	-1.14 (-2.07)**	-1.84 (-3.04)**	0.37 (0.74)	-0.13 (-0.30)	0.69 (0.93)	2.29 (2.56)**	1.73 (1.28)
4.32%	0.27 (0.78)	0.35 (1.61)	-0.19 (-1.17)	0.01 (0.05)	-0.03 (-0.19)	-0.32 (-1.47)	-0.15 (-1.02)	-0.43 (-2.07)*	0.27 (0.65)

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

The results reported in [Table 6](#) support H2, which states that some of the shift in shareholder composition results from more prudent institutional investors selling to less prudent institutional investors. Specifically, bank trust departments are more inclined to reduce their holdings or to eliminate their positions altogether at the first sign of trouble. Nonetheless, consistent with H3, which states that some of the shift in ownership structure results from better-informed institutional investors selling to less well-informed investors, independent investment advisors account for the largest decline in the fraction of shares in the year prior to turnover. In sum, the results in [Table 6](#) are consistent with both the prudence and informed trading explanations.

### 5.6. Changes in institutional ownership by level of ownership

As a second test of H3, we examine differences in changes in institutional ownership during the two years prior to forced CEO turnover between institutions with large and small fractional ownership. If at least part of the change in shareholder composition in the forced turnover sample results from trading on an informational advantage by some institutions, we expect to observe that institutions with larger fractional ownership are more likely to sell shares. In addition to having greater incentives to collect additional information regarding the firm's future potential, institutions with large fractional ownership often have access to board members, senior managers, suppliers, and customers. Such access is typically not available to smaller investors.

In [Table 7](#), institutions are partitioned based on the size of their fractional holdings of sample firm shares two years before forced turnover. The table distinguishes between those that hold less than 1% of a firm's shares and those that hold 1% or more of a firm's shares. The first row reports the aggregate proportions of shares held by the two institutional investor groups. Note that the sum of the two percentages reported in the first row equals the aggregate percent institutional ownership reported in [Table 1](#), 43.3%. Comparing the two figures reveals that institutions holding at least 1% of the sample firm shares account for over half of the institutional ownership at those firms. The second row in [Table 7](#) reports the percentage change in institutional ownership attributed to each of the two ownership groups and to institutions that do not own shares two years prior to the turnover, but do own shares at the time of the turnover.

On average, institutions holding at least 1% of the outstanding shares two years before forced turnover reduce their aggregate ownership by 13.50 percentage points (second row), from 26.13% (first row) to 12.63% of the total shares outstanding, representing a decrease of 51.66% in the aggregate holdings of these institutions. In contrast, institutions initially holding less than 1% of a sample firm's shares reduce their aggregate holdings an average of 3.48 percentage points, from 17.16% to 13.68% of the total shares outstanding, representing a decrease of 20.28%. The difference in the change in aggregate institutional ownership attributed to these two shareholder groups is statistically significant at the 1% level.

The third through fifth rows in [Table 7](#) report the fraction of institutions in each group (i.e., those holding more than 1% of the shares and those holding less than 1%

Table 7

Changes in institutional ownership over two years preceding forced CEO turnover, sorted by size of institutions' holdings. Institutions are partitioned based on size of holdings in the firm, including those with holdings of less than 1% and those with holdings of 1% or more of the outstanding shares two years prior to forced CEO turnover. The first row reports the mean cross-sectional fraction of shares held by institutions within each group two years prior to CEO turnover. The second row reports the mean cross-sectional percentage change in institutional ownership attributed to each in their positions, increases in their positions, and no change in their positions. The fourth column reports *t*-statistics for tests that the values in the first two columns are equal. The first *t*-statistic is a paired *t*-statistic and the last three are for tests of differences in means. The statistics in the first two rows are computed at the firm level for the 102 firms with forced turnover. The statistics in rows three through five are computed at the institution-firm level with the number of institution-firm observations reported in the last row. The turnover occurs in quarter  $t = 0$ .

	Institutions with $\geq 1\%$ ownership	Institutions with $< 1\%$ ownership	Institutions with no ownership at $t = -8$	<i>t</i> -statistic for test that the values in the first and second columns are equal
Institutional ownership at $t = -8$ ( $n = 102$ )	26.13%	17.16%		
Change in ownership in quarters $t = -7$ to $t = 0$ ( $n = 102$ )	-13.50%	-3.48%	12.64%	-8.34***
Institutions with negative change	80.36%	74.41%	0.00%	-4.62***
Institutions with positive change	18.77%	25.04%	100.00%	4.94***
Institutions with no change	0.86%	0.55%	0.00%	-1.05
Number of observations	1,044	12,850	5,210	

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

of the shares) with positive changes in ownership, negative changes in ownership, and no changes in ownership, respectively, over quarters  $-7-0$ . The last row reports the number of institution-firm observations used to compute the statistics in the third through the fifth rows. The evidence indicates that institutions with larger holdings are more likely to decrease their holdings in the two years prior to forced turnover than institutions with smaller holdings. *T*-statistics, reported in the fourth column, reveal that differences in the mean values reported in the first two columns are statistically significant at the 1% level. Overall, the evidence in Table 7, supporting H3, indicates that much of the selling prior to forced turnover can be attributed to institutions with large holdings that, presumably, are the most likely to be informed.

### 5.7. Long-term performance and changes in institutional ownership

As a final test of H3, we examine the relation between changes in institutional ownership and long-term returns in general. Extant work (e.g., Wermers, 1999; Nofsinger and Sias, 1999) suggests that institutional investors are better informed over horizons out to two years. We build on this work and examine the relation between different measures of changes in institutional ownership and returns out to four years.

To compare the returns of stocks institutional investors buy with those they sell, we compute, for all NYSE firms, institutional ownership change quintile portfolios each quarter according to the quarterly change in institutional ownership. The quarterly change in institutional ownership is measured in the four different ways described in Sections 4.2 and 5.1, which include the change in number of institutions owning the stock, the change in fractional institutional ownership, the abnormal change in the number of institutional owners, and the abnormal change in fractional institutional ownership.

For each stock-quarter we calculate a market-adjusted return, defined as the quarterly return on the stock less the CRSP NYSE equal-weighted market return that quarter.<sup>7</sup> We then compute the compound market-adjusted return for each stock over the different time periods and the cross-sectional average compound abnormal return across the stocks in each institutional ownership change quintile portfolio. The first two rows of Table 8 report the time-series averages of these cross-sectional averages for the stocks in the top and bottom institutional ownership change quintile portfolios. The third row of each panel shows the mean difference between the first two rows.

The results in Table 8 show that, in general, for the four years following the portfolio formation date, the firms in which institutions increase their holdings by the greatest amount outperform the firms in which the institutions decrease their holdings by the greatest amount. The results suggest that some institutions are better informed than other investors. This is consistent with H3, that the change in shareholder composition in the years prior to forced CEO succession is due in part to

<sup>7</sup>We find similar results when we repeat the analysis with capitalization quintile-adjusted returns.

Table 8

Long-term performance and changes in institutional ownership

This table reports the results of an analysis of the relation between institutional ownership changes and long-term performance. Each quarter, NYSE stocks are partitioned into change in institutional ownership quintiles. A market-adjusted return is calculated for each stock-quarter as the quarterly return on the stock less the CRSP equal-weighted NYSE return. Market-adjusted returns for each stock are then compounded up to four years. Cross-sectional averages are then computed for firms in each institutional ownership change portfolio. The table reports the time-series average of these cross-sectional averages for the extreme quintiles, including the quintile with the largest increase in institutional ownership and the quintile with the largest decrease. The third row of each panel is the mean difference between the first two rows. *T*-statistics (computed from time-series standard errors) for tests that the average values equal zero are provided in parentheses

	Quarter +1	One year forward return ( <i>n</i> = 68)	Two years forward return ( <i>n</i> = 68)	Three years forward return ( <i>n</i> = 68)	Four years forward return ( <i>n</i> = 64)
<i>Panel A: Quintiles formed on changes in number of institutional investors</i>					
Largest increase in number of institutions	0.34 (0.85)	1.29 (2.06)**	1.72 (1.70)	2.94 (2.39)**	5.42 (3.83)***
Largest decrease in number of institutions	-0.38 (-1.42)	-2.12 (-4.15)***	-1.41 (-1.94)*	-0.61 (-0.67)	0.68 (0.60)
Difference	0.72 (1.24)	3.41 (3.72)***	3.13 (2.32)**	3.55 (2.29)**	4.75 (2.64)**
<i>Panel B: Quintiles formed on changes in fraction of shares held by institutional investors</i>					
Largest increase in % institutional ownership	0.06 (0.26)	0.62 (1.51)	0.72 (1.32)	1.43 (2.06)**	2.40 (2.84)***
Largest decrease in % institutional ownership	-0.24 (-0.71)	-1.54 (-3.25)***	-1.24 (-2.06)**	-0.85 (-1.21)	-0.89 (-0.89)
Difference	0.30 (0.73)	2.17 (3.62)***	1.96 (2.58)**	2.28 (2.34)**	3.29 (2.56)**
<i>Panel C: Quintiles formed on abnormal changes in number of institutional investors</i>					
Largest increase in abnormal number of institutions	0.45 (1.39)	1.04 (1.80)**	1.74 (2.03)**	2.91 (2.89)***	5.21 (4.45)***
Largest decrease in abnormal number of institutions	-0.32 (-1.42)	-0.73 (-1.68)	-1.32 (-0.21)	1.13 (1.32)	2.41 (2.36)**
Difference	0.77 (1.76)*	1.77 (2.43)**	1.87 (1.76)*	1.77 (1.36)	2.79 (1.94)*
<i>Panel D: Quintiles formed on abnormal changes in fraction of shares held by institutional investors</i>					
Largest increase in abnormal change in % institutional	0.24 (0.84)	0.50 (1.09)	0.73 (1.27)	1.56 (2.02)**	2.36 (2.59)**
Largest decrease in abnormal change in % institutional	-0.11 (-0.47)	-0.93 (-2.26)**	-0.74 (-1.27)	-0.40 (-0.60)	-0.01 (-0.08)
Difference	0.36 (1.22)	1.44 (2.53)**	1.47 (2.05)**	1.97 (2.14)**	2.43 (2.18)**

\*Indicates statistical significance at the 10% level, \*\* at the 5% level, \*\*\* at the 1% level.

better informed institutional investors selling to less well-informed institutions and individual investors.

### 5.8. Corporate governance characteristics and changes in institutional ownership

In this section we examine H4, the possibility that some institutional investors sell shares when they are dissatisfied with management because they believe the corporate governance structure makes direct action too costly. These governance characteristics help determine how effectively managers are monitored and how much influence a shareholder can exert. For example, evidence suggests that outside directors are more likely to replace a poorly performing CEO and to appoint a new executive from outside the firm (Weisbach, 1988; Borokhovich et al., 1996). In addition, CEOs who are members of a firm's founding family tend to control relatively large blocks of stock either directly or indirectly. This type of control makes it more difficult to remove such CEOs (Morck et al., 1989; Parrino, 1997). Similarly, greater fractional stock ownership can help non-founding family CEOs retain their positions.

We examine the relation between governance characteristics and changes in ownership structure by regressing the change in institutional ownership during the year prior to turnover for firms in the forced, matched control, and voluntary CEO turnover samples on the governance characteristics. Table 9 reports the results of regressions of the four measures of changes in institutional ownership on three governance variables: a family CEO dummy that equals one if the CEO is a member of the founding family, the percentage of outside directors on the board, and the fraction of shares held by the CEO. Additional variables are included in these regressions to control for a dividend cut in the year preceding turnover (a dummy variable that equals one if the firm cuts or eliminates the dividend in the year prior to turnover), operating performance (industry-adjusted EBIT/assets), market-adjusted stock performance, and firm size (the natural log of market capitalization). In addition, we include dummy variables for the matched control sample and the voluntary CEO turnover sample. If the change in ownership structure is fully accounted for by governance structure, dividend cuts, operating performance, stock performance, and firm size, the coefficients associated with these two dummy variables should not differ meaningfully from zero.

Table 9 shows that firms experience larger declines in both raw and abnormal changes in the number of institutional investors when the CEO is a member of the founding family (marginally significant at the 10% level). This is consistent with the hypothesis that some institutional investors are more likely to sell shares when they believe they are unlikely to influence corporate decisions. We find no evidence, however, that any of the measures of changes in institutional ownership are related to the other governance characteristics. In addition, the statistically significant (at the 5% level or better) voluntary turnover and matched control firm dummy variables suggest that institutions tend to reduce their holdings in the forced turnover sample to a greater extent than they do in the matching control sample or in the voluntary turnover sample, even after accounting for corporate governance

Table 9

Regression of change in institutional ownership on corporate governance characteristics and other variables

This table reports results from OLS regressions of the change in institutional ownership in the year prior to turnover on firm characteristics. The sample includes 570 firms with adequate data that experience CEO turnover or are a matched control firm for forced CEO turnovers (65 forced, 398 voluntary, and 107 matching). The change in institutional ownership is represented by four variables used in the different regressions: change in the number of institutional owners, change in the fraction of shares held by institutional investors, abnormal change in the number of institutional owners, and abnormal change in the fraction of shares held by institutional investors. The firm characteristics include a matching firm dummy variable (one if the firm is in the matching firm control sample and zero otherwise), a voluntary turnover firm dummy variable (one if the firm is in the voluntary turnover sample and zero otherwise), founding family dummy (one if CEO is a member of the founding family and zero otherwise), the fraction of directors who are outsiders, the fraction of shares held by the CEO, a dummy variable indicating a dividend cut in the year preceding turnover, industry-adjusted level of accounting performance (EBIT/book assets) in the year preceding turnover, and the market-adjusted stock return in the year preceding turnover. The *t*-statistics are reported in parentheses.

Explanatory variable	Dependent variable			
	$\Delta$ no. of institutions	$\Delta$ % institutional ownership	Abnormal $\Delta$ no. of institutions	Abnormal $\Delta$ % institutional ownership
Constant	-25.45** (-2.02)	0.05 (1.14)	-21.87* (-1.77)	0.39 (1.03)
Matching sample dummy	10.11** (2.85)	0.06*** (5.14)	10.33** (2.99)	0.06*** (5.19)
Voluntary turnover dummy	7.91** (2.67)	0.05*** (5.29)	7.32** (2.53)	0.04*** (4.97)
Founding family dummy	-6.24* (-1.89)	-0.02 (-1.51)	-6.04* (-1.88)	-0.01 (-1.39)
% outside directors	-2.06 (-0.27)	-0.003 (-0.13)	-2.00 (-0.26)	0.00 (0.16)
% shares owned by the CEO	11.29 (0.59)	0.03 (0.43)	12.18 (0.65)	0.04 (0.66)
Dividend cut dummy	-13.71*** (-3.94)	0.01 (0.87)	-13.02*** (-3.83)	0.01 (0.76)
Industry-adjusted EBIT/assets	-3.45 (-0.50)	-0.01 (-0.21)	-1.12 (-0.17)	0.01 (0.31)
Market-adjusted return	46.10*** (12.80)	0.06*** (5.53)	34.94*** (9.93)	0.04** (3.39)
Log (market capitalization)	2.10** (2.73)	-0.01** (-2.24)	1.45* (1.94)	-0.59** (-2.55)
<i>N</i>	570	570	570	570
<i>R</i> <sup>2</sup>	0.35	0.11	0.26	0.08

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

characteristics, dividend cuts, operating performance, stock performance, and firm size.

Another governance factor that could affect ownership structure surrounding CEO turnover is shareholder activism by public pension and union funds. Previous

studies examine whether such activism has an effect on management turnover. Four of these studies find no relation between CEO turnover and shareholder proposal submissions or public targeting (Smith, 1996; Karpoff et al., 1996; Del Guercio and Hawkins, 1999; Opler and Sokobin, 1998). Yet, Huson (1997) finds higher turnover in firms that are targeted by one public pension fund, CalPERS. In addition, although Opler and Sokobin find no change in the rate of CEO turnover following appearance on the Council of Institutional Investors' focus list, they do find management turnover rates at these firms to be abnormally high in comparison to the sample examined by Warner et al. (1988).

Given the diversity of the evidence in other studies, we check to see whether shareholder activism had an effect on our results. We restrict the sample period to 1987 through 1993, because shareholder proposal submissions by public pension funds were first observed in 1987. Despite the large change in ownership structure in these firms, we find little evidence of extensive activism as represented by shareholder proposals. Shareholder proposals were submitted during three years prior to the turnover announcement at only ten of the 78 firms that experienced forced turnover during the 1987 to 1993 period. In unreported results, we also find no significant difference in the changes in institutional ownership between firms with shareholder proposals and the firms without.

### *5.9. A summary of reasons why some institutions sell*

The evidence reported in this section suggests the shift in shareholder composition prior to forced CEO turnovers results from several factors. The positive cross-sectional correlation between returns and changes in institutional ownership reveals that some institutions sell because these institutions are momentum traders and these securities suffer from poor performance. For our sample, however, increases in the general level of institutional ownership more than offset this effect; that is, abnormal changes in institutional ownership are greater than raw changes in institutional ownership. In addition, institutional investors abandon stocks that subsequently experience forced CEO succession to a greater degree than similar performing stocks that do not experience forced CEO succession (firms in the matched control sample). Thus, the results suggest that at least some institutional investors respond differently when the poor performance is attributed to the managers, as in the forced CEO succession sample, and when the performance problems are more exogenous, as in the matching control sample.

The desire by some institutional investors to hold prudent securities, H2, appears to explain part of the change in ownership structure. Three pieces of evidence support the hypothesis that more prudent investors sell to less prudent investors. First, institutional selling is greater when firms cut or eliminate dividends. Nonetheless, firms with forced turnover still experience greater declines in institutional ownership than other firms when controlling for dividend cuts and eliminations. Second, the most conservative institutional investor class, bank trust departments, accounts for the greatest selling. Third, stock price volatility increases in the pre-turnover period for firms in the forced turnover sample. Changes in

shareholder composition, however, stabilize in the post-turnover period even though volatility for firms in the forced turnover sample remains high.

The change in ownership structure also appears to result from selling by better-informed institutional investors to less well-informed institutional and individual investors (H3). Shareholders with larger fractional holdings, and therefore arguably more likely to be informed, account for most of the selling. In addition, much of the change in ownership structure in the year prior to forced CEO turnover is attributed to independent investment advisors, the institutional investors who are most likely to be informed. Moreover, consistent with previous work, we find that the stocks most heavily purchased by institutional investors outperform those most heavily sold by institutional investors in the subsequent four years.

Finally, we find weak evidence the change in shareholder composition results, in part, from selling by some institutional investors who believe the corporate governance structure makes direct action too costly (H4). Specifically, some institutional investors appear more likely to sell when the CEO is a member of the founding family.

Overall, the evidence indicates that the equity ownership structure changes prior to forced CEO turnover. On average, there is an increase in ownership by individual investors, institutional investors less concerned with holding prudent securities, less well-informed institutional investors, and away from institutions that engage in momentum trading.

## 6. Institutional selling and board decisions

The previous evidence shows a shift in shareholder composition preceding forced CEO turnover and shows that much of the shift can be attributed to institutions that hold larger positions in these firms; that is, 1% owners. We next examine whether this shift can influence the decision to replace the CEO and the choice of the successor. As noted in the introduction, boards of directors may respond to the change in the ownership structure for several reasons, including selling price pressure, changes in monitoring, and concern for signals conveyed to other investors. If changes in shareholder composition influence the decisions made by directors, then changes in institutional ownership should help predict forced CEO succession and the choice of a successor.

In [Table 10](#) we report the results from multinomial logistic regressions in which the dependent variable equals zero if the observation is for a firm in the forced turnover sample, one if the firm is in the voluntary turnover sample, and two if the observation is for a matched control firm. We include a number of additional independent variables identified in previous literature (e.g., [Weisbach, 1988](#); [Parrino, 1997](#)) as helpful in discriminating between forced and voluntary turnovers. Specifically, we include independent variables to control for CEO age, whether the CEO is a member of the founding family, whether the firm reduced or eliminated dividends in the year before turnover, the percent of outside directors on the board, industry-adjusted EBIT/assets in the fiscal year before the turnover is announced,

Table 10

## Multinomial logit regression of turnover on firm characteristics

This table shows results from multinomial logistic regression models with type of turnover (zero for forced, one for voluntary, and two for no turnover (i.e., matching control firm sample)) as the dependent variable and firm characteristics as the independent variables for a sample of 575 firms with adequate data (66 forced turnovers, 402 voluntary turnovers, and 107 no-turnover matching control firms). The firm characteristics include CEO age dummy (one if CEO age is greater than 59 and zero otherwise), founding family dummy (one if CEO is a member of the founding family and zero otherwise), a dummy variable indicating a dividend cut in the year preceding turnover, the percentage of outside directors, industry-adjusted level of accounting performance (EBIT/book assets) in the year preceding turnover, the market-adjusted stock return in the year preceding turnover, and the change in institutional ownership in the four quarters preceding turnover. The change in institutional ownership is represented by four variables used in the different regressions: change in the number of institutional owners (Model 2), change in the fraction of shares held by institutional investors (Model 3), abnormal change in the number of institutional owners (Model 4), and abnormal change in the fraction of shares held by institutional investors (Model 5). The *t*-statistics are reported in parentheses.

Explanatory variable	Model									
	(1)		(2)		(3)		(4)		(5)	
	Voluntary	Matching	Voluntary	Matching	Voluntary	Matching	Voluntary	Matching	Voluntary	Matching
Constant	0.901 (0.92)	0.054 (0.05)	0.985 (0.97)	0.107 (0.10)	1.186 (1.18)	0.273 (0.25)	1.091 (1.08)	0.231 (0.21)	1.260 (1.25)	0.398 (0.36)
CEO age dummy	2.059*** (6.90)	-0.138 (-0.40)	2.031*** (6.66)	-0.149 (-0.42)	1.940*** (6.37)	-0.257 (-0.72)	2.043*** (6.69)	-0.140 (-0.40)	1.948*** (6.41)	-0.254 (-0.72)
Founding family dummy	2.021* (1.94)	3.158*** (3.04)	2.048* (1.96)	3.172*** (3.04)	1.98* (1.89)	3.100*** (2.96)	2.068*** (1.98)	3.179*** (3.05)	1.962* (1.87)	3.068*** (2.93)
Dividend cut dummy	-0.533 (-1.19)	-1.333** (-2.41)	-0.345 (-0.76)	-1.103* (-1.95)	-0.592 (-1.30)	-1.361** (-2.41)	-0.333 (-0.73)	-1.081* (-1.91)	-0.583 (-1.28)	-1.367** (-2.42)
% outside directors	-0.576 (-0.45)	0.296 (0.21)	-0.848 (-0.64)	0.040 (0.03)	-0.881 (-0.67)	-0.050 (-0.03)	-0.860 (-0.65)	-0.005 (-0.00)	-0.917 (-0.70)	-0.084 (-0.06)

Industry-adjusted EBIT/assets	2.264*	-0.389	2.454*	-0.042	2.503*	-0.032	2.477*	0.015	2.487*	-0.050
	(1.74)	(-0.27)	(1.83)	(-0.03)	(1.89)	(-0.02)	(1.85)	(0.01)	(1.87)	(-0.03)
Market-adjusted return	1.400**	-0.746	0.463	-1.621*	0.964	-1.493*	0.641	-1.494*	1.102*	-1.310*
	(2.24)	(-1.05)	(0.63)	(-1.95)	(1.46)	(-1.95)	(0.93)	(-1.90)	(1.70)	(-1.74)
$\Delta$ number of institutions			0.018**	0.018**						
			(2.46)	(2.16)						
$\Delta$ % institutional ownership			4.354**	8.361**						
			(1.99)	(3.29)						
Abnormal $\Delta$ number of institutions							0.02***	0.02**		
							(2.60)	(2.40)		
Abnormal $\Delta$ % institutional ownership									3.649*	8.673***
									(1.65)	(3.33)
Number of forced turnovers	66.0		64.0		64.0		64.0		64.0	
Number of voluntary turnovers	402.0		399.0		399.0		400.0		399.0	
Number of matching firm observations	107.0		104.0		104.0		104.0		104.0	
Model $\chi^2$	204.1***		200.7***		206.1***		202.0***		206.9***	

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

and market-adjusted stock return in quarters  $-4$  to  $-1$ , inclusive. The CEO age dummy variable equals one if the incumbent CEO is greater than 59 years old. We use four different measures to capture the effects of changes in institutional ownership: the raw and abnormal changes in fractional institutional ownership and the raw and abnormal changes in the number of institutional investors over quarters  $-4$  to  $-1$ , inclusive. Because we are interested in predicting forced turnover, we focus on performance and changes in ownership in the four quarters prior to the quarter in which the turnover occurs (i.e., quarters  $-4$  to  $-1$ ).

The first model in [Table 10](#) reports the estimated coefficients from a model that includes all variables except the change in institutional ownership. The signs of the estimated coefficients for the voluntary turnover outcome are largely consistent with earlier work (see [Weisbach, 1988](#); [Parrino, 1997](#)). Older CEOs, CEOs who are member of the firm's founding family, and CEOs of firms that recently had higher accounting and stock returns are less likely to be forced out.

The second–fifth models in [Table 10](#) each include a measure of the change in institutional ownership as an explanatory variable. The coefficients for these variables are all positive and statistically significant, indicating that firms that experience a decline in the raw or abnormal number of institutional investors or fractional institutional ownership are more likely to experience a forced CEO turnover.

In comparing forced turnovers to voluntary turnovers, it should be noted that the market-adjusted return variable is not statistically significant (at traditional levels) in Models 2–4 and is only marginally significant in Model 5. This suggests that the change in the number and fractional holdings of institutional investors subsumes the explanatory power of returns for differentiating between these two groups. That is, holding the change in institutional ownership constant, we find little evidence that lag returns can be used to discriminate between forced and voluntary turnovers. Overall, the evidence in [Table 10](#) is consistent with the idea that at least some boards are influenced by the change in shareholder composition when deciding whether to force CEO succession.

To the extent that directors care about which investors hold their firms' shares, a change in the ownership structure may place pressure on directors not only to replace poorly performing CEOs, but also to identify successors who are likely to restore the confidence of investors. Given the previous evidence that a new CEO who is appointed from outside the firm is more likely to break with the failed policies of his or her predecessor ([Borokhovich et al., 1996](#)) and that operating performance is better following a forced turnover when an outsider is appointed CEO ([Huson et al., 2001](#)), we expect that directors will take the more drastic measure of not only firing the old CEO, but also replacing the CEO with an outsider if their decision is affected by the shift in shareholder composition. This implies a negative relation between the change in institutional ownership and the likelihood that an outsider is selected to replace the departing CEO.

To investigate how the change in ownership structure influences the selection of a new CEO, we first examine the frequencies of forced turnover and outside succession. [Table 11](#) reports the frequencies of forced turnover, outside succession,

Table 11

CEO turnover frequencies by change in institutional ownership during the year preceding turnover. Turnover is classified as forced if the incumbent CEO departs prior to age 60 and does not leave for other employment or for health reasons or if the *Wall Street Journal* reports that the CEO was forced from the position. All other turnovers are classified as voluntary. An outside succession is a succession in which the new CEO has been employed at the firm for one year or less at the time of the turnover.

	Increase in institutional ownership			Decrease in institutional ownership			$\chi^2$ statistic for test that the percentages of total are equal for positive and negative institutional ownership changes
	N	Percent of total (%)	Percent of forced (%)	N	Percent of total (%)	Percent of forced (%)	
All turnovers	334			237			
Forced turnover	46	13.77		62	26.16		10.60***
Outside succession	52	15.57	41.30	59	24.89	66.13	5.73***
Forced/outside succession	19	5.69		41	17.30		16.70***

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

and forced/outside succession for subsamples in which the percentage of shares held by institutions increases during the year preceding turnover (quarters  $-4$  to  $-1$ , inclusive) and in which the percentage of shares held by institutions decreases.<sup>8</sup> Following Parrino (1997), an outside appointment is defined as an appointment in which the new CEO has been employed at the firm for one year or less at the time of the turnover announcement. The evidence in this table indicates that the frequencies of all three classes of turnover are significantly greater when institutional ownership at the firm declined in the previous year. The higher frequency of forced turnover associated with decreases in institutional ownership is not surprising given the relation between forced turnover and changes in institutional ownership that we previously documented. The significantly higher frequency of outside succession following declines in institutional ownership, especially when turnover is forced, suggests the change in ownership structure is also associated with the choice of the successor. Following a decline in institutional ownership, outsiders replace 66.13% of CEOs who are forced from office. In contrast, only 41.30% of fired CEOs are replaced by outsiders when institutional ownership recently increased. This difference is significant at the 2% level. The higher frequency of outside appointments in forced turnovers when institutional ownership recently declined is consistent with the argument that changes in shareholder composition influence board decisions.

To further investigate this issue, we estimate multinomial logit models to directly measure the relations between changes in institutional ownership and the likelihood that an executive from outside the firm replaces a CEO who is forced from office. These logit models have four outcomes: (1) voluntary/inside turnovers, (2)

<sup>8</sup>The analysis does not include the matching control firms because they had no CEO turnovers.

voluntary/outside turnover, (3) forced/inside turnover, and (4) forced/outside turnover and allow us to control for CEO and firm characteristics that are likely to affect the selection of a new CEO. The results are reported in [Table 12](#), where the logit regressions differ only in the measure of the change in institutional ownership. Each regression includes controls for CEO age, whether the firm cut or eliminated dividends in the year prior to turnover, the fraction of outside directors on the board, industry-adjusted accounting performance, and market-adjusted stock performance.<sup>9</sup> All of the reported coefficient estimates in [Table 12](#) are computed relative to the voluntary/inside turnover outcome. The negative coefficient estimates for the institutional ownership variables for forced/outside succession in all of these models suggest that changes in ownership structure influence the choice of a successor in forced turnovers. Boards of firms at which the number of institutional investors and the fraction of shares held by institutional investors recently declined are more likely to appoint an executive who is likely to break with the failed policies of the previous CEO—an outsider.

In sum, the results reported in this section are consistent with the hypothesis that the shift in shareholder composition influences the decisions made by the board of directors. As noted in the introduction, however, it is also possible that the relation between changes in ownership composition and board decisions are related to other exogenous factors. For example, some institutional investors may have informal contact, such as a phone call, with the board explaining their reasons for selling. Alternatively, the shift in the ownership composition and the board's decisions may be related to other unexamined factors (e.g., media coverage of management's performance).

## 7. Conclusions

Although practitioners have long claimed that institutional investors vote with their feet, empirical evidence is scant. We investigate this phenomenon by examining changes in ownership structure prior to forced CEO turnover. Our results reveal that institutional investors engaging in momentum trading, institutional investors more concerned about holding prudent securities, and better-informed institutional investors sell to individual investors, institutional investors not engaging in momentum trading, institutional investors less concerned about holding prudent securities, and less well-informed institutional investors. This results in a substantial shift in shareholder composition prior to forced CEO succession.

The shift in ownership composition may influence the boards of directors when they decide whether to force a CEO from office and in selecting a new CEO. The change in institutional investor ownership in the year prior to turnover can be used to discriminate forced CEO turnovers from voluntary turnovers and firms in the

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<sup>9</sup>The founding family dummy variable that is included in the regressions in [Table 10](#) is excluded because there are no instances in which a member of a founding family is forced from office and replaced by an outsider.

Table 12

Regression of relation between turnover type, origin of successor, and changes in institutional ownership. This table shows results from multinomial logistic regression models with four turnover outcomes (voluntary/inside, voluntary/outside, forced/inside, and forced/outside) as the dependent variables and firm characteristics as the independent variables. The firm characteristics include CEO age dummy (one if CEO age is greater than 59 and zero otherwise), a dummy variable indicating a dividend cut in the year preceding turnover, the percentage of outside directors, industry-adjusted level of accounting performance (EBIT/book assets) in the year preceding turnover, the market adjusted stock return in the year preceding turnover, and the change in institutional ownership in the four quarters preceding turnover. The change in institutional ownership is represented by four variables used in the different regressions: change in the number of institutional owners (Model 1), change in the fraction of shares held by institutional investors (Model 2), abnormal change in the number of institutional owners (Model 3), and abnormal change in the fraction of shares held by institutional investors (Model 4). The *t*-statistics are reported in parentheses.

Explanatory variable	Model 1				Model 2			
	Turnover outcome		Turnover outcome		Turnover outcome		Turnover outcome	
	Vol/out	Force/ins	Force/out	Vol/out	Vol/out	Force/ins	Force/out	
Constant	-5.01*** (-3.70)	-2.31* (-1.72)	-3.78** (-2.44)	-5.10*** (-3.73)	-2.40* (-1.79)	-4.22*** (-2.74)		
CEO age dummy	-0.74* (-1.96)	-2.55*** (-5.89)	-1.88*** (-4.61)	-0.72* (-1.91)	-2.51*** (-5.77)	-1.75*** (-4.33)		
Dividend cut dummy	-0.28 (-0.42)	-0.35 (-0.47)	0.75 (1.40)	-0.35 (-0.53)	-0.22 (-0.30)	1.14** (2.13)		
% outside directors	4.97*** (2.89)	1.98 (1.11)	3.70* (1.84)	5.04*** (2.91)	2.05 (1.14)	3.99** (2.01)		
Industry-adjusted EBIT/assets	-2.58* (-1.86)	-2.09 (-1.21)	-2.64 (-1.48)	-2.59* (-1.84)	-2.23 (-1.30)	-2.79 (-1.61)		
Market-adjusted return	-0.05 (-0.06)	-1.54 (-1.43)	0.28 (0.29)	-0.17 (-0.25)	-1.34 (-1.39)	-0.67 (-0.67)		
Δ number of institutions	0.00 (0.08)	-0.00 (-0.38)	-0.02*** (-2.81)					
Δ % institutional ownership				2.70 (0.96)	-4.28 (-1.53)	-5.03* (-1.82)		
N (turnovers)		462			462			
N (voluntary/inside)		353			353			
N (voluntary/outside)		45			45			
N (forced/inside)		31			31			
N (forced/outside)		33			33			
Model $\chi^2$		108.22***			106.75***			

Table 12 (continued)

Explanatory variable	Model 3			Model 4		
	Turnover outcome			Turnover outcome		
	Vol/out	Force/ins	Force/out	Vol/out	Force/ins	Force/out
Constant	-5.01*** (-3.71)	-2.33* (-1.74)	-3.88** (-2.52)	-5.10*** (-3.72)	-2.44* (-1.82)	-4.28*** (-2.79)
CEO age dummy	-0.74* (-1.95)	-2.55*** (-5.89)	-1.88*** (-4.61)	-0.73* (-1.92)	-2.51*** (-5.79)	-1.75*** (-4.33)
Dividend cut dummy	-0.28 (-0.42)	-0.35 (-0.48)	0.75 (1.41)	-0.38 (-0.57)	-0.24 (-0.33)	1.12** (2.11)
% outside directors	4.98*** (2.90)	1.97 (1.11)	3.64* (1.82)	5.09*** (2.92)	2.04 (1.14)	4.00** (2.01)
Industry-adjusted EBIT/assets	-2.57* (-1.86)	-2.09 (-1.21)	-2.72 (-1.52)	-2.61* (-1.86)	-2.22 (-1.29)	-2.81 (-1.61)
Market-adjusted return	-0.06 (-0.08)	-1.56 (-1.53)	0.01 (0.01)	-0.14 (-0.21)	-1.50 (-1.59)	-0.83 (-0.94)
Abnormal $\Delta$ number of institutions	0.00 (0.14)	-0.00 (-0.43)	-0.03*** (-2.85)			
Abnormal $\Delta$ % institutional ownership				3.93 (1.36)	-3.39 (-1.21)	-4.24 (-1.52)
N (turnovers)		462			462	
N (voluntary/inside)		353			353	
N (voluntary/outside)		45			45	
N (forced/inside)		31			31	
N (forced/outside)		33			33	
Model $\chi^2$		108.49***			106.33***	

\*Indicates statistical significance at the 10% level; \*\* at the 5% level; \*\*\* at the 1% level.

matched control sample. Moreover, an outsider is more likely to be appointed CEO following a decline in institutional ownership.

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