

GOVERNANCE CHANGES FOR FIRMS ADDED TO THE S&P 500

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ABSTRACT

What happens to corporate governance after a firm is added to the S&P 500 index? Using firms added from 1994 to 2007, this paper examines how governance mechanisms change for these firms. Specifically, we look at both the overall governance and details on how each mechanism changes. We find that governance improves after being added to the index. Controlling for firm size, leverage, prior firm performance, and growth opportunities, the market reacts positively to governance improvements as a whole. In addition, changes in governance are positively associated with changes in operating performance.

JEL: G340, G390

KEYWORDS: Corporate Governance, S&P 500, Firm Performance

INTRODUCTION

What happens to corporate governance after a firm is added to the Standard & Poor's 500 Index (S&P 500)? Companies included in the S&P 500 index are selected by the Index Committee and a team of analysts and economists at Standard and Poor's. The potential companies have to distinguish themselves in order to gain membership; thus, membership in the S&P 500 index provides a certain level of prestige to its members. However, little is known about what happens after a firm is added. Much of research focuses on interim performance and reports that the market reacts favorably to firms following index inclusion (Harris and Gurel, 1986; Shleifer, 1986; Beneish and Whaley, 2002). Others have focused on long-term performance, where they provide evidence of a puzzling superior performance persistence post-addition (Lynch and Mendenhall, 1997; Kaul, Mehrotra, and Morck, 2000). While prestige and "certification" can be used to explain the transitory price effect (Jain, 1987), the justification for the permanent price effect is less clear. Chen, Noronha, and Singh (2004) suggest the price effect is attributable to an increase in investor awareness, while Platikanova (2008) asserts that it is likely related to an improvement in earnings quality.

However, being added to the index may lead to an improvement the firm's governance structure. These changes in monitoring mechanisms following index inclusion may (at least partially) explain the performance persistence in firm performance. Denis, McConnell, Ovtchinnikov, and Yu (2003) show that inclusion in the S&P 500 Index is associated with higher analyst estimates of operating performance and higher realized earnings. They argue that inclusion leads to greater scrutiny and monitoring of management. Gompers, Ishii, and Metrick (2003) provide evidence that a firm's governance structure does have a permanent performance effect. Thus, changes in governance mechanisms following index inclusion may help explain the persistence in firm operating performance.

Research has shown that institutional investors increase their holdings in firms that are being added to the index (Pruitt and Wei, 1989; Lynch and Mendenhall, 1997; Shankar and Miller, 2006). A similar trend is

found for analyst coverage as well (Yu, 2008). However, these studies focus on external monitoring that may exhibit pressure or scrutiny on management rather than on internal governance mechanisms.

In this study, we extend this literature by taking a more comprehensive look at how more traditional measures of governance change following additions. Specifically, we examine eight monitoring mechanisms both individually and in aggregate. The aggregate approach is designed to capture the notion that monitoring mechanisms may be substitutes or complements (Rediker and Seth, 1995). Thus, considering governance as a whole gives a more comprehensive picture of how governance changes. Mechanisms examined in this study include the Governance Index (G-Index), Entrenchment Index (E-Index), institutional ownership, managerial ownership, blockholders' ownership, duality, board size, and the proportion of outsiders on a board. To capture overall monitoring changes, we create an Improvement Index (I-Index), which is simply a collection of improvements in monitoring mechanisms.

We find that governance improves after firms are added to the S&P 500 index. For firms that alter their governance structures, we show a significant improvement in the G-Index, the E-Index, institutional ownership, duality, board size, and the percentage of outsiders on the board. We also find a significant overall improvement in governance, captured by our I-Index. This supports Denis et al. (2003), who suggest index inclusion is associated with improved monitoring. To see how the market reacts in response to changes in governance mechanisms, cumulative abnormal returns (CARs) are regressed on the various governance mechanisms. The results suggest that changes in institutional ownership have a significant impact. In addition, we find a positive and significant association between announcement returns and the I-Index, suggesting that the market anticipates and views aggregate governance improvements as good news. Finally, we find that governance improvements are positively related to operating performance improvements following inclusion.

This study contributes to the literature in several ways. First, prior research on governance focuses on subsets of mechanisms. This paper acknowledges the fact that firms have the ability to choose among different governance mechanisms and examines a collection of governance mechanisms. Using a novel measure, we offer a different perspective for examining governance issues at an aggregate level. Second, this paper provides an alternative explanation to the long-term performance persistence following inclusion. Improved governance is associated with better performance, consistent with Gompers et al. (2003). Third, we show that being added to the S&P 500 affects a firm's overall governance structure. Specifically, monitoring is increased, which is consistent with the increased public scrutiny and monitoring of firms in the index suggested by Denis et al. (2003). The remainder of the paper is organized as follows. The next section discusses the literature and hypotheses. The data and sample construction are then discussed, followed by a discussion of the results. The last section provides some concluding remarks.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The S&P 500 index is considered a bellwether for the American economy and is often regarded as the best single gauge of the U.S. equities market (Standard and Poor's, 2009). In order to be included in this index, potential firms have to first meet seven eligibility criteria: (1) domicile, (2) market capitalization of \$3.5 billion or more, (3) public float of at least 50%, (4) four consecutive quarters of positive as-reported earnings, (5) contribute to sector balance maintenance, (6) adequate liquidity and reasonable price, and (7) company type. Firms are selected for inclusion by the S&P Index Committee, a team of economists from S&P and index analysts. Being selected for inclusion conveys a level of prestige for firms as well as positive information about the prospects and longevity of that firm, and thus provides "certification" to potential investors (Jain, 1987; Dhillon and Johnson, 1991).

Numerous studies have found positive announcement returns for firms added to an index (Harris and Gurel, 1986; Shleifer, 1986; Dhillon and Johnson, 1991; Beneish and Whaley, 2002; Chen et al., 2004). In addition,

prior studies have demonstrated that firms exhibit superior long-term performance following index inclusion (Lynch and Mendenhall, 1997; Kaul et al., 2000; Madhavan, 2003; Chen et al., 2004; Platikanova, 2008). Using a simple model of demand curves for stocks, Wurgler and Zhuravskaya (2002) argue that since individual stocks do not have perfect substitutes, risk-averse arbitrageurs have to bear additional risk and thus will trade less aggressively. They show that mean cumulative abnormal returns for added stocks do not reverse within 20 trading days and their findings support the notion that demand curves for stocks slope downwards. Using realized earnings per share (EPS), Denis et al. (2003) show that firms added to the S&P 500 index outperform peer firms and argue that index inclusion is not an information-free event.

The performance improvement phenomenon is not only limited to the United States. Kaul et al. (2000) examine firms in the Toronto Stock Exchange (TSE) 300 index to test whether demand curves for stocks slope downwards. They argue that unlike using the S&P 500, the addition to the TSE 300 is information free and therefore allows them to segregate the price pressure effects. They show that stock prices do not reverse even as trading volume returns to normal. Thus, they find support for downward sloping demand curves for stocks. However, the explanation for the persistence is mixed. Chen et al. (2004) argue that the permanent price effect is due to an increase in investor awareness while Platikanova (2008) asserts that it is due to an improvement in earnings quality. Denis et al. (2003) suggest firms benefit from improved monitoring. Consistent with Denis et al. (2003), some studies have shown that firms encounter noticeable governance changes after being added to an index. Pruitt and Wei (1989) examine actual changes in institutional holdings and find that additions to the S&P 500 index are associated with increases in these holdings. Hegde and McDermott (2003) also find that institutional investors increase their holdings following S&P 500 index addition. In another S&P 500 study, Chen et al. (2004) report that both the number of institutions and institutional holdings increase after firms are added to the index. An increase in institutional holdings has also been observed in firms added to the Russell 2000 index (Biktimirov, Cowan, and Jordan, 2004) and S&P 600 index (Shankar and Miller, 2006).

While institutional investors may serve an important monitoring role, the literature has not taken a comprehensive examination of governance changes following inclusion to the S&P 500 Index. In our study, we also examine institutional ownership, but add to it the G-Index, E-Index, managerial ownership, blockholders' ownership, duality, board size, and outside directors. Gompers et al. (2003) construct a Governance Index to capture the extent of shareholder protection in a corporation using the incidence of twenty-four governance rules. The G-Index is constructed using charter provisions, bylaw provisions, other firm-level rules, and state takeover laws. As Gompers et al. (2003) note, the power-sharing relationship between shareholders and managers is defined by the rules of corporate governance. Firms with low index values have the strongest shareholder rights (or better governance) and firms with high index values have the weakest rights (or worse governance). The Entrenchment Index, constructed by Bebchuk, Cohen, and Ferrell (2009), is a subset of six provisions from the G-Index (staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, supermajority requirements for charter amendments, poison pills and golden parachutes). They contend that these elements of the G-Index drive the performance and governance link in Gompers et al. (2003). A high E-Index suggests an entrenched management team that may be difficult to monitor or essentially a firm with poor governance.

Low levels of managerial ownership are also associated with weak governance (Jensen and Meckling 1976). Ang, Cole, and Lin (2000) find that agency costs vary inversely with the manager's ownership share, providing support to the theoretical predictions of Jensen and Meckling (1976). Likewise, blockholders may serve a monitoring function. Park and Song (1995) compare the year-end performance between block firms and non-block firms and find that block firms outperform non-block firms, which they attribute to monitoring. Shome and Singh (1995) examine the relationship between firm value and blockholdings and find that the market reaction to the announcement of block formations is positive. Board characteristics also capture the monitoring potential. Agency theory suggests that it may not be in the firm's best interest to have the CEO holding the Chair of the Board position (Fama and Jensen, 1983; Rechner and Dalton, 1991;

Jensen, 1993; Pi and Timme, 1993). The rationale is that the CEO may become too powerful for the board to overcome since he/she is also heading the board. Thus, duality is associated with poor governance.

In addition, larger boards are less effective (Jensen 1993). Yermack (1996) and Eisenberg, Sundgren, and Wells (1998) provide evidence that smaller boards are associated with higher firm value. Thus, if governance improves following index inclusion, board size should decrease. However, when large institutions increase their holdings in a firm, they may want to secure a board seat, thereby increasing the board size. Prior studies provide evidence on the favorable impact of outside directors on firm decisions aimed at maximizing shareholder wealth. Beasley (1996) documents a negative relationship between outside directors and likelihood of financial fraud. Fama and Jensen (1983) indicate that outside directors, by providing expertise and monitoring services, add value to firms. Rosenstein and Wyatt (1990) provide evidence on the potential benefit of having an outsider on a board by showing that the appointment of an outside director is accompanied by significantly positively excess returns.

In addition to examining individual mechanisms, some studies suggest that mechanisms may be interrelated. Using young IPO firms, Berry, Fields, and Wilkins (2006) provide evidence that governance mechanisms may work positively to reduce the agency costs that arises from the decrease of managerial ownership. Examining multiple control mechanisms, Rediker and Seth (1995) also provide evidence supporting the substitution hypothesis. Using a large sample of firms, Agrawal and Knoeber (1996) provide empirical evidence of interdependence among various governance mechanisms. Thus, we combine the mechanisms to examine the aggregate effect. Specifically, we define governance-improving changes as an increase in institutional holdings, a decrease in the G-Index, a decrease in the E-index, an increase in managerial ownership, an increase in blockholders holdings, a reduction of duality, a reduction in board size, and an increase in the proportion of outside directors.

DATA AND METHODOLOGY

Firms added to the S&P 500 index are identified from the Standard and Poor's website. To ensure accuracy, firms are then verified through the *Wall Street Journal*, *New York Times*, *Los Angeles Times*, *Washington Post*, ProQuest, and *PR Newswire*. The sample period begins in 1994, which is the starting date for company filings at the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database of the U.S. Securities and Exchange Commission (SEC), and ends in 2007. This ending period (2007) was selected primarily because we wanted to exclude the recent financial crisis period. During a financial crisis (recession), firm performance and/or governance structure are erratic. This initial process yields a sample of 427 firms. Additional restrictions are imposed which reduce the sample size. Not all index additions convey valuable information for the current study. Firms that are added to the index due to mergers and acquisitions, corporate restructuring and/or name changes were excluded from the sample, reducing the sample size to 393. To be able to estimate the change in institutional ownership, information on institutional ownership must be available for 2 quarters prior and 2 quarters after the announcement date.

Firms with missing information are excluded (25 firms). In addition, we lose sample firms (11 firms) due to a lack of CRSP closing price information from 2 days prior to 2 days after the announcement date. We also lose firms because of missing Compustat data (5 firms) and missing proxy statements (5 firms). The final sample includes 347 firms. Cumulative Abnormal Returns (CARs) are used to measure the market reaction. A firm's cumulative return (CRTN) is calculated as the sum of the firm's holding period return over the 2-day period. We use three indices to proxy for the market, namely the S&P 500 index, the CRSP Value-Weighted index, and the CRSP Equal-Weighted index. The market cumulative return (CMKTRTN) is calculated as the sum of the market's holding period return over the same 2-day period. For robustness, we calculate CARs using two event windows, (0,2) and (-1,1). The CARs over a 2-day window are calculated as the difference between the firm's cumulative return and the market's cumulative return over a 2-day window, as shown below:

$$CAR_i = CRTN_{it} - CMKTRTN_i \tag{1}$$

Studies have shown that firms being added to an index exhibit positive announcement period abnormal returns (Beneish and Whaley, 2002). As shown in Table 1, the sample CAR over the (0,2) and (-1, 1) windows are 4.3% and 4.5%, with p-values less than 0.01.

Table 1: Cumulative Returns

	Event Window (0,2)	Event Window (-1,1)
Additions Sample	0.043	0.045
S&P 500 Index	-0.001	0.000
Difference	0.044	0.045
P-values	0.000	0.000

The cumulative return is calculated as the sum of the daily return within the event windows, (0,2) and (-1,1). The abnormal or excess return is simply the difference between the cumulative return of the sample and the cumulative return of the S&P 500. The sample size used in this study is 347 firms.

We use eight commonly used measures of governance, including the G-Index, E-Index, institutional ownership, managerial ownership, blockholders’ ownership, duality, board size, and proportion of outsiders on a board. The G-Index, adopted from Gompers et al. (2003), tracks 24 unique provisions covered by the Investor Responsibility Research Center (IRRC). The E-Index, adopted from Bebchuk et al. (2009), is based on six of the 24 provisions tracked by the G-Index and attempts to capture the extent to which shareholders can impose their will on management. Both indexes are derived using a similar method: one point is added for every provision that restricts shareholder rights, i.e., a lower score implies stronger shareholder rights. To see the change in G-Index and E-Index after the firm’s inclusion to the S&P 500 Index, we take the difference between the G-Index/E-Index values pre- and post-addition to the index. For example, S&P announced on May 25, 2000, that Agilent Technologies would be added to the S&P 500 index. In this case, we take the G-Index in 1998 (pre-addition) and 2002 (post-addition) to calculate the difference. Note that information on the G-Index and E-Index are not available every year. Data on the G-Index and the E-Index are obtained from Andrew Metrick’s and Lucian Bebchuk’s websites, respectively.

Institutional ownership (*IO*) is defined as the ratio of total shares owned by all institutions to the total shares outstanding (*TSO*). Quarterly institutional holdings data and total shares outstanding are obtained from the CDA/Spectrum Institutional Investors’ (13-F) database and Standard and Poor’s Compustat (COMPUSTAT) database, respectively. The change in institutional ownership (ΔIO) in response to addition to the S&P 500 index is calculated as the difference between institutional ownership in the quarter before and the quarter after the announcement quarter:

$$\Delta IO = \frac{IO_{q+1}}{TSO_{q+1}} - \frac{IO_{q-1}}{TSO_{q-1}} \tag{2}$$

Since institutional ownership data are only available quarterly, the institutional ownership before and after each quarter are used to allow more time for changes to materialize. For example, the announcement that Maxim Integrated Products was to be included in the S&P 500 index was made on May 2, 2000. In this case, the post-institutional ownership information and pre-institutional ownership information are obtained from the quarter ending September 30, 2000 and March 31, 2000, respectively. For completeness, we also calculate change in institutional ownership using two quarters before and two quarters after the announcement quarter. The results are qualitatively similar. Management ownership is defined as the total shareholdings of all senior management and directors and is obtained from the proxy statements. To calculate the change in management ownership, we take the difference between the pre- and post-inclusion management ownership. Blockholders are individuals or institutions that hold a substantial stake in a

corporation. A blockholder is defined as an individual or institution holding at least 5% of the firm's total outstanding shares. Blockholder ownership is defined as the ratio of sum of all shares owned by all blockholders to the total shares outstanding. Information on blockholders' holdings is obtained from proxy statements. To measure the change in blockholders' ownership, we subtract the pre-addition blockholders' ownership from the post-addition blockholders' ownership.

We also examine board characteristics. Board size is the number of directors on a corporate board. Larger boards, which may be less efficient, are generally viewed as having a negative effect on firm value. To calculate the change in board size, we obtain the board size in the year before the inclusion and the board size in the year after the inclusion and take the difference. The proportion of outside directors on a board is the fraction of outside/independent directors as a percentage of the board size. Directors are classified as independent/outside if they are not employees of the firm, do not have substantial business relations with the firm, are not related to employees, or are not former employees. For the change in the proportion of outside directors on a board, we obtain the proportion of outside directors on a board from prior the inclusion and post-inclusion and subtract the prior from the post. Duality is defined as a firm having the same person holding the Chief Executive Officer (CEO) and Chair of the Board (Chair) positions. Duality takes the value 1 if the same person holds the CEO/Chair posts, and zero otherwise. To see the change in duality, we examine the duality situation pre- and post-addition and take the difference between them. Data on board-related information are hand-collected from proxy statements.

To measure the overall governance effect, we construct an Improvement Index (I-Index). For each governance mechanism, we compare the pre- and post-addition values and determine whether it has improved or not. Similar to the G-Index and E-Index, we simply add one for each improvement to the I-Index. An improvement is defined as (1) a decrease in the G-Index, (2) a decrease in the E-Index, (3) an increase in institutional ownership, (4) an increase in management ownership, (5) an increase in blockholders' ownership, (6) a decrease in duality, (7) a decrease in the board size, (8) an increase in the proportion of outside directors on a board.

The control variables used are firm size, prior performance, growth opportunities, and leverage. Smaller firms typically outperform larger firms (Keim, 1983; Perez-Quiros and Timmermann, 2000). We use the natural logarithm of total assets to proxy for size. We control for prior performance using industry-adjusted Return on Assets (ROA) from the prior year. Firms that perform well tend to have better governance characteristics. Gompers et al. (2003) show a positive relation between firm performance and governance. Firms are classified into industries based on their 2-digit Standard Industrial Classification (SIC) codes. Industry-adjusted ROA is the firm's ROA in excess of the median firm's ROA in that same 2-digit SIC industry. Tobin's Q is used to control for growth opportunities. A firm's growth opportunities are likely to affect its governance, as evidenced by Smith and Watts (1992) and Lehn, Patro, and Zhao (2009). Tobin's Q is calculated using Chung and Pruitt's (1994) methodology:

$$Tobin's\ Q = \frac{(MVE + PS + DEBT)}{TA}, \text{ where } MVE \text{ is the product of a firm's share price and the number of}$$

common shares outstanding; *PS* is the liquidating value of the firm's outstanding preferred stock; *DEBT* is the value of the firm's short-term liabilities net of its short-term assets, plus the firm's long-term debt; *TA* is the total assets of the firm. Finally, we control for leverage. The level of debt may impact the firm's future cash flows and the market's expectations (Campello, 2006; George and Hwang, 2010). Leverage is the ratio of long-term debt to total assets. Variables used to obtain and calculate the control variables are obtained from COMPUSTAT.

Table 2 shows the summary statistics for the sample. A typical corporate board of firms added to the S&P 500 consists of about nine members (median), of which around 70% are independent directors. On average, blockholders hold about one-fifth of total shares outstanding while insiders own approximately 6.3% of total outstanding shares. The mean (median) G-Index and E-Index for the sample is 8.89 (9.00) and 2.48 (3.00), respectively. More than 70% of the sample firms have one person serving both the CEO and Chair posts. Institutional investors own approximately two-thirds of total shares outstanding. The average number of governance improvements, as shown by the I-Index, is around three, with a maximum of eight. Sales for the sample average about \$1.26 billion. Market capitalization for the average firm in the sample is \$9.64 billion, consistent with the S&P 500 focus on large cap stocks. On average, a firm has about 16.8% of long-term debt. Industry-adjusted ROA and Tobin's Q average at around 1.5% and 2.679, respectively. A typical firm added to the S&P 500 is outperforming its industry peers.

Table 2: Summary Statistics

Variables	Mean	Median	St. Deviation
G-Index	8.890	9.000	2.604
E-Index	2.484	3.000	1.417
Duality	0.706	1.000	0.456
Institutional Ownership	0.655	0.683	0.213
Blockholders' Ownership	0.196	0.140	0.192
Management Ownership	0.063	0.000	0.086
Board Size	10.02	9.000	3.500
Percent Outsiders	0.674	0.714	0.188
Improvement Index	3.012	3.000	0.075
Industry-Adjusted ROA	0.015	0.011	0.035
Tobin's Q	2.679	1.782	2.556
Leverage	0.168	0.125	0.164
Sales (\$ millions)	1,260.0	679.0	1,700.0
Market Capitalization (\$ millions)	9,640.0	6,780.0	11,600

This table shows the descriptive statistics for the variables used in this study. Institutional ownership is the total institutional holdings as a percentage of total shares outstanding. Blockholder ownership is the combined holdings of all blockholders. Management ownership is the combined holdings of all senior management. Board size is the total number of directors on a corporate board. Percent outsiders is the proportion of outside directors as a percentage of board size. A director is classified as independent/outside if they are not employees of the firm, do not have substantial business relations with the firms, are not related to employees, or are not former employees. The Improvement Index compares governance mechanisms before and after being added to the S&P 500 Index. We add one for each improvement, where an improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. Industry-adjusted ROA is the difference between the firm's ROA and the ROA of the median firm in the same industry. Tobin's Q is calculated using Chung and Pruitt (1994)'s methodology, as the sum of the market value of equity, preferred equity, short-term liabilities net of short-term assets, and long term debt over total assets. Leverage is the ratio of long term debt over total assets. Sales is net sales revenue. Market capitalization is the market value of equity. The sample size used in this study is 347 firms.

RESULTS

To explore how governance changes after being added to the S&P 500 index, we compare each mechanism before and after the addition using paired t-tests. The results are summarized in Table 3. Institutional ownership increases significantly over the event, averaging a 4.2% increase. This result reaffirms the findings by Pruitt and Wei (1989) and Biktimirov et al. (2004). We also find statistically significant changes in the percentage of outsiders on the board and duality, both changing in the direction suggesting better governance. Changes in other variables are not statistically significant. However, mean levels of managerial ownership and blockholders increase, board sizes decrease as do the G-Index and E-Index means.

Table 3: Governance Variables before and after Being Added to the S&P 500 Index

Variables	Before Being Added	After Being Added	Difference	P-Value
G-Index	8.890	8.830	-0.061	0.270
E-Index	2.484	2.427	-0.058	0.103
Institutional Ownership	0.655	0.697	0.042	0.000***
Management Ownership	0.063	0.070	0.006	0.128
Blockholders' Ownership	0.196	0.201	0.005	0.657
Duality	0.706	0.663	-0.043	0.063*
Board Size	10.023	9.931	-0.092	0.376
Percent Outsiders	0.663	0.674	0.011	0.067*

For every firm, each governance variable is collected pre- and post- being added to the S&P 500 index. Then, the pre- and post- variables are paired up and their means are compared. The sample consists of 347 firms. *** and * denotes statistical significance at the 1% and 10% levels, respectively.

In addition, a t-test and a Wilcoxon signed-rank test are conducted on the I-Index. The results are summarized in Table 4. On average, each firm exhibits three governance improvements over the event. Both tests conclude that the mean and median of the I-Index are positive and significantly different from zero. This provides support to our hypothesis that firms improve governance following addition to the Index. To further investigate whether the governance mechanisms improve, we examine each mechanism in greater detail. The G-Index, E-Index, and board-related mechanisms for quite a number of firms in the sample exhibit no change. For example, 282 out of 347 firms show no change in duality, while 240 and 205 firms have no change in the E-Index and the G-Index, respectively. To address this, we perform a one-sample test of proportions on each mechanism. For each mechanism, we compare the firms that improve to those which deteriorate, excluding the firms with no change. Table 5 summarizes the results. With the exception of managerial and blockholders' ownership, all other mechanisms show evidence of statistically significant improvements. For example, 62.0% (G-Index) and 63.6% (E-Index) of the firms that change governance indexes show improvements. Approximately 66% of the firms that see changes in institutional ownership experience an increase. Firms that change also seem to significantly reduce duality, shrink board size, and increase the proportion of outside directors. In addition, we find no evidence of governance getting significantly worse. In general, Table 4 suggests that when firms make changes following their inclusion on the S&P 500 Index, they generally improve monitoring.

Table 4: Changes in the Improvement Index following S&P 500 Index Addition

Variable	# Observations	Mean	Standard Error	P-Value	
Improvement Index	347	3.012***	0.0753	0.000	
Variable	# Observations	# Positive	# Negative	# Zero	Z
Improvement Index	347	329	0	18	16.224***

The Improvement Index compares governance mechanisms before and after being added to the S&P 500 Index. We add one for each improvement, where an improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. The t-test tests whether the mean is significantly different from zero. *** denotes statistical significance at the 1% level.

Next, we examine whether the market reacts to changes in governance mechanisms. In other words, we explore whether at least part of the favorable reaction to index inclusion is a result of anticipated governance changes. Specifically, we regress the CARs on binary variables that take the value one if there is an improvement in governance. An improvement is defined as a decrease in the G-Index, E-Index, duality, and board size or an increase in institutional ownership, management ownership, blockholders' ownership, and the proportion of outside directors on the board. The control variables include proxies for firm size, prior profitability, growth opportunities, and leverage.

The regression results are presented in Table 6. Only the institutional ownership dummy variable is statistically significant. The positive coefficient for institutional ownership suggests that the market reacts

positively to an improvement in institutional ownership. All the other governance variables are not statistically significant. We also take a more aggregate look at governance improvements, essentially considering that governance mechanisms work in cohesion (rather than in isolation). In Table 6, we report results from CARs regressed on our I-Index and control variables. Consistent with the importance of governance, the market reacts more positively to firms that make governance improvements. The coefficient on the change in the I-Index is positive and significant. This suggests the market reaction is at least partially based on anticipated improvements in the overall governance or monitoring of the firm. Since prior literature has documented the importance of institutional ownership changes following index inclusion, we also verify that our results are not solely driven by institutional holdings. Specifically, we modify the I-Index to exclude improvements in institutional ownership and re-run the regression. As shown in model (2), the coefficient for I-Index is still positive and statistically significant.

Table 5: Proportions Test

Variables	# Observations	Mean	Z-Statistic	P-Value
Improvement in G-Index	142	0.620***	2.853	0.004
Improvement in E-Index	107	0.636***	2.804	0.005
Improvement in Institutional Ownership	347	0.660***	5.959	0.000
Improvement in Management Ownership	347	0.542	1.557	0.120
Improvement in Blockholders' Ownership	323	0.536	1.280	0.201
Improvement in Duality	65	0.615*	1.861	0.063
Improvement in Board Size	178	0.573*	1.949	0.051
Improvement in Percent Outsiders	234	0.573**	2.223	0.026

For every firm, we capture whether each governance variable has improved or deteriorated. We denote an improvement with a 1 and 0 for a deterioration. An improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. Governance variables that do not change are excluded. A proportions test is conducted on each governance variable. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6: CAR Regression on Governance Changes

Variables	Coefficient	P-Value
Constant	0.2132***	0.006
G-Index Improvement Dummy	-0.0058	0.418
E-Index Improvement Dummy	0.0120	0.123
Management Ownership Improvement Dummy	0.0062	0.305
Blockholders' Ownership Improvement Dummy	0.0004	0.947
Institutional Ownership Improvement Dummy	0.0316***	0.000
Duality Improvement Dummy	-0.0087	0.358
Board Size Improvement Dummy	0.0058	0.349
Percent Outsiders Improvement Dummy	-0.0042	0.524
Growth Opportunities	-0.0016	0.338
Firm Size	-0.0083**	0.010
Prior Performance	-0.0877	0.341
Leverage	-0.0113	0.559

The dependent variable is the Cumulative Abnormal Returns (CARs) associated with the announcement of addition into the S&P 500 Index. The independent variables are binary variables that take the value 1 if an improvement occurs, and zero otherwise as well as control variables. An improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. P-values are reported in parenthesis. *** and ** denotes statistical significance at the 1% and 5% levels, respectively. Sample size and R-square are 347 and 0.0992, respectively.

The results from Table 7 suggest that improvements in overall governance are viewed favorably by the market. To see whether operating performance improvement is associated with governance mechanisms improvements, we regress changes in ROA on governance improvement dummy variables. We calculate changes in ROA from year t+1 to years t+2, t+3, t+4 and t+5. The results are summarized in Table 8. In all of the specifications, the improvement in the G-Index is associated with performance improvement. Also, in three of the four specifications, the duality improvement dummy variable is positive and statistically significant. As expected, the separation of the CEO/Chair position is associated with performance improvements. We also see that an increase in managerial ownership is positively related to

an improvement in performance for ROA changes from year one to year two and year three. In model specification (1), a decrease in the board size is significantly associated with an improvement in operating performance, consistent with Jensen (1993) and Yermack (1996).

Table 7: CAR Regression on Governance Improvement

Variables	Model (1)	Model (2)
Constant	0.2047*** (0.008)	0.2186*** (0.005)
Improvement Index (with Institutional Ownership)	0.0067*** (0.002)	-
Improvement Index (without Institutional Ownership)	-	0.0045* (0.075)
Growth Opportunities	-0.0016 (0.341)	-0.0018 (0.281)
Firm Size	-0.0077** (0.019)	-0.0078** (0.018)
Prior Performance	-0.0748 (0.422)	0.0793 (0.399)
Leverage	-0.0238 (0.220)	-0.0253 (0.196)
R-square	0.0493	0.0310
# Observations	347	347

The dependent variable is the Cumulative Abnormal Returns (CARs) associated with the announcement of addition into the S&P 500 Index. The Improvement Index compares governance mechanisms before and after being added to the S&P 500 Index. We add one for each improvement, where an improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. We calculate the I-Index with and without institutional ownership. P-values are reported in parenthesis. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Performance Regression on Governance Changes

Variables	Δ ROA (Yr2-Yr1)	Δ ROA (Yr3-Yr1)	Δ ROA (Yr4-Yr1)	Δ ROA (Yr5-Yr1)
Constant	-0.1047 (0.540)	-0.0494 (0.800)	-0.0761 (0.701)	-0.1003 (0.635)
G-Index Improvement Dummy	0.0609*** (0.000)	0.0502*** (0.010)	0.0565*** (0.005)	0.0497** (0.016)
E-Index Improvement Dummy	0.0132 (0.459)	0.0280 (0.194)	0.0201 (0.389)	0.0273 (0.265)
Management Ownership Improvement Dummy	0.0239* (0.087)	0.0340** (0.038)	0.0209 (0.211)	-0.0007 (0.968)
Blockholders' Ownership Improvement Dummy	0.0151 (0.279)	0.0246 (0.129)	0.0186 (0.260)	0.0205 (0.230)
Institutional Ownership Improvement Dummy	0.0137 (0.395)	0.0291 (0.116)	0.0286 (0.138)	0.0155 (0.426)
Duality Improvement Dummy	0.0443* (0.054)	0.0728*** (0.006)	0.0555** (0.048)	0.0448 (0.114)
Board Size Improvement Dummy	0.0328** (0.023)	0.0274 (0.101)	0.0264 (0.122)	0.0240 (0.180)
Percent Outsiders Improvement Dummy	0.0163 (0.284)	0.0275 (0.117)	0.0208 (0.244)	0.0208 (0.257)
Growth Opportunities	-0.0019 (0.601)	-0.0020 (0.626)	0.0025 (0.544)	-0.0006 (0.905)
Firm Size	0.0009 (0.904)	-0.0026 (0.757)	-0.0019 (0.823)	-0.0008 (0.929)
Prior Performance	0.0147 (0.941)	0.0759 (0.742)	0.0086 (0.973)	0.0810 (0.747)
Leverage	-0.0219 (0.633)	-0.0663 (0.224)	-0.0128 (0.819)	0.0149 (0.793)
R-square	0.1196	0.1500	0.1195	0.0917
# Observations	294	257	237	215

The dependent variable is the change in ROA. Changes in ROA from year $t+1$ to years $t+2$, $t+3$, $t+4$ and $t+5$. The independent variables are binary variables that take the value 1 if an improvement occurs, and zero otherwise. An improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. P-values are reported in parenthesis. ***, **, and * denotes statistical significance at the 1%, 5%, and 10% levels.

Table 9: Performance Regression on Governance Improvements

Variables	Δ ROA (Yr2-Yr1)	Δ ROA (Yr3-Yr1)	Δ ROA (Yr4-Yr1)	Δ ROA (Yr5-Yr1)
Constant	-0.1191 (0.478)	-0.0549 (0.773)	-0.0822 (0.672)	-0.0832 (0.684)
Improvement Index	0.0256*** (0.000)	0.0349*** (0.000)	0.0294*** (0.000)	0.0230*** (0.000)
Growth Opportunities	-0.0016 (0.650)	-0.0020 (0.627)	0.0025 (0.544)	-0.0016 (0.723)
Firm Size	0.0011 (0.878)	-0.0028 (0.726)	-0.0021 (0.794)	-0.0021 (0.807)
Prior Performance	-0.0213 (0.914)	0.0459 (0.839)	0.0225 (0.927)	0.1174 (0.635)
Leverage	-0.0068 (0.881)	-0.0476 (0.367)	0.0115 (0.831)	0.0338 (0.537)
R-square	0.0951	0.1378	0.1030	0.0697
# Observations	294	257	237	215

The dependent variable is the change in ROA. Changes in ROA from year $t+1$ to years $t+2$, $t+3$, $t+4$ and $t+5$. The Improvement Index compares governance mechanisms before and after being added to the S&P 500 Index. We add one for each improvement, where an improvement is defined as a decrease in the G-Index, a decrease in the E-Index, an increase in institutional ownership, an increase in management ownership, an increase in blockholders' ownership, a decrease in duality, a decrease in the board size, and an increase in the proportion of outside directors on the board. P-values are reported in parenthesis. *** denotes statistical significance at the 1% level.

The regression results in Table 9 account for governance interdependencies by using our I-Index. In all four specifications, the coefficient for the I-Index is positive and statistically significant. An improvement in governance is associated with an improvement in operating performance. This result suggests that governance improvements following index inclusion are associated with better operating performance. Our results also emphasize the need to consider governance as a whole. Mechanisms may be working in cohesion rather than in isolation. Firms need not improve all governance mechanisms to improve monitoring.

Robustness of Results

We explore the robustness of our results in several ways. For the CARs, we examine results for other windows, (-2,2) and (0,1). The results are qualitatively similar to the (0,2) and (-1,1) windows reported. In addition, our results are robust to using two other market indices (CRSP value-weighted index and CRSP equal-weighted index) to calculate CARs. All results are also robust to using either sales or market capitalization to proxy for firm size (Kaul et al., 2000; Hartzell and Starks, 2003; Madhavan, 2003; Yu, 2008). In addition, in most model specifications we use dummy variables for governance mechanism improvements following the addition to the S&P 500 Index. Our results are robust to using levels of changes. Finally, two components of the I-Index, the G-index and E-index, are highly correlated (correlation coefficient > 0.60), and are potentially capturing the same aspect of governance. To make sure the results are not biased due to this relation, we perform additional analyses by (1) excluding E-Index and (2) by excluding G-index in the I-Index computation. All results are qualitatively similar.

CONCLUSIONS

We examine what happens to the governance structures of firms added to the S&P 500 index. With a sample of 347 firms, we compare the pre- and post-addition governance mechanisms and find that firm governance improves after being added to the index. In particular, for firms that change their governance structures, G-Index, E-Index, institutional holdings, duality, board size and the proportion of outside directors all exhibit significant improvements. This finding is reinforced by the fact that a typical firm exhibits three governance improvements post-addition. We also explore whether the positive stock market reaction at the announcement of the addition is related to the anticipated governance changes. We show

that the market reacts positively to an increase in institutional ownership. Using governance improvements in aggregate, the relationship between the market reaction and the I-Index is positive and significant. Hence, the market reacts more favorably to firms making governance improvements following index inclusion. This suggests these anticipated changes are viewed favorably.

Finally, we examine the relationship between governance improvements and operating firm performance. We find that improvements in governance are positively related to operating performance improvement. While our results are strongest using our aggregate measure of governance improvements (I-Index), we find improvements in operating performance are also significantly associated with improvements in the G-Index, managerial ownership, duality, and board size. This may shed light on the documented puzzle of performance persistence following index inclusion. We show that operating performance improvements are positively related to governance improvements. Limitations exist due to various reasons. First, endogeneity issues exist between performance and governance, which we did not address in this paper due to resource restrictions. Given more resources, this issue could be moderated. Second, this paper examines only U.S. large firms. It could be extended to mid-sized (S&P400) or even small-sized (S&P600) firms. Alternatively, one could explore firms from other economies (TSX Composite [Canada], FTSE 100 [London], Nikkei 225 [Tokyo], etc.) to see if the results hold across borders. In summary, our results support the notion that for firms added to the S&P 500 index, governance shows improvement and that this improvement leads to better operating performance. Our findings also highlight the necessity to consider governance collectively.

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