When is board independence beneficial to mutual fund shareholders?

Evidence from the 2001 SEC amendment

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ABSTRACT

I study how board independence affects fund performance, in relation to investment experience of independent directors. Using the SEC amendment in 2001 as an exogenous shock, I find that board independence does not improve or damage fund performance on average. When a fund board has independent directors with investment experience, however, it boosts fund performance. I also find that a fund manager is less constrained and the management fee on a contract is more aligned with fund performance under such a fund board. My findings suggest that board independence is not always beneficial to mutual fund shareholders, but its effectiveness varies depending on independent directors' investment experience.

JEL classification: G23; G28.

Keywords: Board independence; Fund performance; SEC amendment in 2001.

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I. Introduction

The fiduciary duty of independent directors in a fund board closely relates to the interest of mutual fund investors. Independent directors separately oversee and evaluate the performance of a mutual fund. Based on the oversight and evaluation, they vote in person to approve an advisory contract and its renewal on an annual basis. The terms of the contract independent directors bargain with a fund manager include the amount of management fee and investment practice restrictions which should be directly tied to fund performance. Along with its important role, regulators have attempted to raise the proportion of independent directors in fund boards to advocate and protect the interest of fund investors. The Securities and Exchange Commission (SEC), for example, mandates fund boards to increase the minimum proportion of independent directors from 40 percent to a majority in 2001. The Investment Company Institute (ICI) recommends each board has a two-thirds majority of independent directors (ICI, 1999). As a result, the number of fund complexes with at least 75 percent of board seats held by independent directors increases from 46 percent in 1996 to 84 percent in 2016 (ICI, 2017).

However, the oversight function performed by independent directors can be limited because they are in a difficult position to acquire necessary information for effective oversight or proper evaluation of mutual funds. As an outsider in the mutual fund they monitor, an independent director likely has no inner source which can provide full information for the directors' duties. Also, inside directors or fund managers are reluctant to share information disadvantageous to them with independent directors at the risk of hash monitoring (Harris and Raviv, 2008). In addition, perhaps more importantly, independent directors usually attend board meetings on a *quarterly* basis to monitor the management of *multiple* funds.[1] It is challenging for independent directors to detect management problems in a number of mutual funds in such a short time. So it is possible that independent directors may be hard to obtain material information regarding mutual fund management and represent the interest of mutual fund investors effectively. Consitent with

[1]ICI (2017) reports the majority of investment companies have four scheduled board meetings in a year. Also, Ferris and Yan (2007) document that the average (median) number of funds overseen by an independent director is 18.54 (6.00) in 2002.

this idea, prior studies have failed to identify significant relation between board independence and fund performance despite of the important role of independent directors as a watchdog in fund management.[2]

Investment experience can improve the ability of independent directors to evaluate and monitor mutual fund management by lowering their cost for information acquisition. Specifically, I focus on investment experience from working experience as a fund manager, a general partner, or an executive officer in an investment company and as a private investor. Independent directors with investment experience likely have knowledge on the nature of investment activities, skills to quickly process financial information, or connections to help them to gain information about fund management. Therefore, investment experience can bridge information gap between independent directors and insiders like inside directors or fund managers. By doing so, it can help independent directors overcome information challenge while evaluating the investment ability of fund managers or the benefit and cost of current investment practice restrictions. Investment experience is helpful especially in the mutual fund industry where the decision-making process in daily trading practices is arguably opaque. In the line of thinking, this paper examines the effect of board independence on fund performance, depending on investment experience of independent directors.

The most challenging issue in this study is that board composition is endogenously determined (Hermalin and Weisbach, 1998; Raheja, 2005). I employ an SEC amendment in 2001 as an "exogenous" regulation shock to address the endogeneity issues in board independence. The amendment requires mutual funds to increase the minimum proportion of independent directors in the board from 40 percent to a majority. I define a treatment (control) group of mutual funds as mutual funds in which independent directors did not (did) constitute a majority of their board of directors before the 2001 SEC amendment. As a result of the amendment, 179 mutual funds in the treatment group significantly increase the averaged proportion of independent directors in a fund board from 47.0 percent to 67.9 percent, while other mutual funds in the control group increases from 74.5 percent to 75.8 percent only. The sudden increase of treated mutual funds

[2]See Almazan, *et al.* (2003), Ferris and Yan (2007), Khorana, Serves, and Wedge (2007), Chen, Goldstein, and Jiang (2008), and Cremers, *et al.* (2009).

in board independence gives me confidence to estimate the effect of fund board independence which is largely free from endogeneity concerns. I compare fund performance of treated mutual funds with that of controlled mutual funds before and after the 2001 amendment, depending on investment experience of independent directors who exist in a fund board before 2001. With the difference-in-difference test, this paper answers whether and when board independence is beneficial to mutual fund investors.

My main finding is that board independence does not improve or damage fund performance on average. However, it significantly increases fund return by 1.98 percent per year at the same level of fund risk when a fund board has an independent director with investment experience. The conditional effect is economically significant, given the average annual return in the treatment group of mutual funds is 0.69 percent. Similarly, I also find that board independence does not on average affect the return of a fund portfolio as well as a return gap – the difference between the reported fund return and the return on a fund portfolio disclosed on the previous quarter. With investment-experienced independent directors, however, board independence makes the return gap significantly increased without notable changes in portfolio return. All findings are robust in a propensity score match analysis, suggesting that they are not driven by pre-existing heterogeneity between treatment and control groups of mutual funds. Note that the return gap can partially capture the trading ability of fund managers and that the return of a portfolio represent their stock-picking ability (Kacperczyk, Sialm, and Zheng, 2008). My findings suggest it is possible that independent directors with investment experience would provide investment environment for fund managers to exert better trading ability.

I look into this possibility by investigating the change of investment practice restrictions and the relation between contractual management fee and fund performance around the SEC amendment. I find that the treatment group of mutual funds decreases 1.40 out of eighteen investment restrictions in the grace period of the 2001 SEC amendment, while the control group decreases 0.56 restrictions only. Notably, the decrease of investment restrictions in the treatment group is mainly attributed to treated mutual funds with at least one independent director with investment experience. I also

find weak evidence on that board independence causes management fee on a contract to be more positively associated with fund performance when a fund board has independent directors with investment experience. My findings suggest that independent directors with investment experience may provide fund managers better investment environment by relaxing investment restrictions and adjusting the level of contractual management fee in line with fund performance.

In addition, I explore endogenous concerns regarding investment experience of independent directors, defined as the proportion of independent directors with investment experience in a fund board who exist in 2000 before the SEC amendment. It would be possible that investment experience of independent directors who are newly hired or resigned after 2000 may affect the effect of board independence on fund performance. If it is the case, one may interpret my main findings as meaning that fund performance improves in response to a change in the proportion of independent directors with investment experience, rather than an increase in the proportion of independent directors. To address that concern, I compare the effect of board independence, conditional on investment experience of independent directors who (1) hold the position, (2) get hired, and (3) are resigned in the grace period of the 2001 amendment. I find that my main findings are mainly driven by independent directors who keep holding the director position in the period, while newly hired independent directors marginally influence the effectiveness of board independence and resigned independent directors have statistically no influence.

Also, it would be possible that independent directors without investment experience may affect the effect of board independence on fund performance. For example, they can provide material inside information to fund managers, using their working experience in non-finance industries (Dass, *et al.*, 2014). If it is the case, the interpretation of my findings is much complicated. Taking this concern into consideration, I compare the effectiveness of board independence, conditional on independent directors with (1) investment experience, (2) working experience in the finance industry except an investment company, and (3) working experience in non-finance industries. I find that independent directors with investment experience play a major role to enhance the effectiveness of board independence, while independent directors with other types of working

experience marginally hurt.

This paper makes three contribution to literature. First, this paper provides evidence that board independence in the mutual fund industry is not always beneficial to mutual fund investors, but its effect varies depending on investment experience of independent directors. Specifically, board independence unconditionally does not increase or decrease fund performance. Having independent directors with investment experience, however, board independence boosts fund return by 1.98 percent per year at the qualitatively same level of fund risk. Furthermore, the evidence suggests that prior studies have failed to find significant relation between board independence and fund performance because the effect of board independence can be cancelled out on average.

Second, this paper provides an insight to mutual fund investors on how to exploit board information in fund investment. Mutual fund investors care little about board information despite of its importance. According to ICI (2006), only five percent of mutual fund holders consider board information to be very important for fund investment. This paper documents evidence that mutual fund investors can have the benefit of board information when they choose an independent fund board which has an independent director with investment experience.

To the best of my knowledge, this is the first paper to study the SEC amendment of 2001. The SEC requires mutual funds to increase the minimum proportion of independent directors in the board from 40 percent to a majority. The amendment is as useful as the Sarbanes-Oxley Act of 2002 to examine the effectiveness of board independence in the mutual fund industry because it makes an exogenous impact on the proportion of independent directors in a board of a non-compliant mutual fund. Specifically, The amendment causes 179 non-compliant mutual funds in my sample to increase the proportion of independent directors from 47.0 to 67.9 percent on average. In sharp contrast, compliant mutual funds increase from 74.5 to 75.8 percent only.

II. Empirical strategy

In this section, I will describe my identification strategy and difference-in-difference estimators based on the SEC amendment of 2001.

The simplest approach to examine the effect of board independence on fund shareholders' interest is to regress after-fee fund return on the proportion of independent directors in a fund board. However, board independence is endogenous in the mutual fund industry. For example, poor fund performance may induce fund shareholders to invite more independent directors into a fund board, as in Hermalin and Weisbach (1998). Also, a fund manager who has strong bargaining power due to his investment ability may strategically move into a fund with a smaller fraction of independent directors in a board, seeking higher fee, as in Tufano and Sevick (1997). Hence results from the regression estimation would be interpreted in various ways. To address the endogeneity concerns and clarify a causal effect, I use the 2001 SEC amendment as a source of exogenous changes in board independence.

In 1992, the Division of Investment Management re-examined the adequacy of the governance structure for investment companies. The Division concluded that the monitoring role of independent directors has served investors well at minimal cost. However, the Division recommended the SEC to increase the minimum proportion of independent directors on fund boards from forty percent to more than fifty percent, taking into account the increasingly significant responsibilities placed on independent directors, e.g., the approval of rule 12b-1 plans. In response, the SEC held a Roundtable in 1999 to discuss the role of independent investment company directors and particularly how to enhance their effectiveness.

After evaluating the ideas and suggestions offered by the Division and the Roundtable, the SEC adopted three amendments in 2001 to enhance director independence and its effectiveness. The Commission requires any mutual fund that relies upon certain exemptive rules (1) to raise the minimum percent of independent directors in board from 40 percent to a majority, (2) to let independent directors nominate and select other independent directors, (3) for independent directors to hire only counsel that does not have substantial tie to fund managers, if they hire counsel. I

study the first amendment among three relevant amendments because it has a clear treatment group of mutual funds for which independent directors did not constitute a majority of the board before the 2001 amendment, while the other amendments influence entire mutual fund industry. The first amendment was announced on January 3, 2001 and its compliance date was July 1, 2002.

I begin by hand-collecting fund-level board information from mutual fund's Statement of Additional Information (SAI). The information contained in the SAI includes the name of fund directors, whether a director is independent, and their principal occupations during the past five years. With the SAI, I define a treatment (control) group of mutual funds in which independent directors did not (did) constitute a majority of their board of directors before the SEC amendment of 2001. I keep mutual funds which has fund performance information in CRSP Survival-Bias Free Mutual Fund Database (CRSP) after matching funds in the SAI and CRSP by a fund name. Finally, I retain mutual funds which have both board and fund information on December 2000 and July 2002. The producedure yields my sample with 179 mutual funds in the treatment group and 5,409 mutual funds in the control group.

I also collect biographical information on fund directors to examine how the effectiveness of board independence varies with investment experience of independent directors. I identify the portion of independent directors with investment experience in a fund board, using the information from the SAI on directors' work history over the last five years. I consider an independent director to have investment experience when the director has working experience as a fund manager, a general partner, or an executive officer in an investment company or as a private investor. In total, I am able to obtain working-experience information on 4,333 fund directors in the mutual fund industry on December 2000 and July 2002.

[Place Figure 1 about here]

Figure 1 presents the change in the proportion of independent directors on a mutual fund board before and after the SEC amendment of 2001. 179 treated mutual funds significantly increase the averaged proportion of independent directors in a fund board from 47.0 percent to 67.9 percent,

while other mutual funds in the control group increase from 74.5 percent to 75.8 percent only.[3] The sudden increase of treated mutual funds in board independence gives me confidence to estimate the effect of fund board independence which is largely free from endogeneity concerns. Using the exogenous shock in board independence, I analyze the effect of board independence on fund performance, conditional on investment experience of independent directors who exist in a fund board before the amendment announcement.

My approach to test for the change of fund performance following the enhanced board independence is to compare the difference in a fund performance measure around the 2001 amendment between treated and controlled mutual funds and examine how the difference depends on investment experience of independent directors. The difference-in-difference methodology, however, would be vulnerable to pre-existing heterogeneity between treatment and control groups because the heterogeneity may affect the estimated impact of independent boards. Therefore, the ex-ante difference between two groups should be controlled to ensure I am correctly identifying the effect of board independence. I take two ways to mitigate the concern. First, I add control variables into my regression models to reduce their effect in my estimation. Second, I use the propensity-score matching procedure to compare treated funds with similar controlled funds.

I estimate the following regression specification to empirically examine how mutual funds react to the exogenous improvement in board independency:

$$\text{Fund Performance}_i = \alpha + \beta_1 \text{After}_i + \beta_2 \text{Treat}_i + \beta_3 \text{After}_i \times \text{Treat}_i + \gamma' \mathbf{X}_i + \epsilon_i, \tag{1}$$

where for each mutual fund i, I use four measures for Fund Performance including fund return, portfolio holding return, the return gap between fund return and portfolio holding return, idiosyncratic risk of fund return, as detailed in Section III; "After" denotes a dummy variable that is equal to one on July 2002 and zero on December 2000; "Treat" denotes a dummy variable that indicates

[3] A usual way for non-compliant mutual funds to increase the proportion of independent directors in a fund board is to replace its insider director with an independent director and maintain the size of a fund board. The replacement does not, at least in my sample, cause a significant change in the portion of investment-experienced independent directors on a fund board around the amendment. That is because treated mutual funds usually elect (remove) an independent (inside) director who has working experience in a non-finance industry, rather than in an investment company.

if a mutual fund is treated or not; $\mathbf{X}$ denotes a vector of control variables including investment experience of independent and inside directors, board size, director age, director compensation, ownership of independent and inside directors, institutional ownership, fund age, fund total net asset, and expense ratio on December 2000. β_3 is the coefficient of interest which captures the effect of enhanced board independence on fund performance of treated funds relative to controlled funds.

I also test how investment experience of independent directors contributes to the effectiveness of board independence by using the following regression model:

$$\begin{aligned} \text{Fund Performance}_i &= \alpha + \beta_1 \text{After}_i + \beta_2 \text{Treat}_i + \beta_3 \text{After}_i \times \text{Treat}_i \\ &\quad + \beta_4 \text{After}_i \times \text{IIE}_i + \beta_5 \text{Treat}_i \times \text{IIE}_i + \beta_6 \text{After}_i \times \text{Treat}_i \times \text{IIE}_i \\ &\quad + \gamma' \mathbf{X}_i + \epsilon_i, \end{aligned} \tag{2}$$

where for each mutual fund i, IE denotes the portion of independent directors with investment experience on a fund board and other variables are the same as above. In the regression model, β_6 is the coefficient of interest which corresponds to the conditional effect of enhanced board independence on fund performance in treated funds relative to controlled funds.

I estimate several versions of equation (1) and (2) in this paper, including fund fixed effects to remove potential time-invariant factors which may influence the effect of the regulation shock on fund performance. The regressor of "After" in the above regression models accounts for time fixed effects because my empirical setting focuses on a single time period around the SEC amendment in 2001. Lastly, standard errors for all specifications are robust to heteroskedasticity and clustered at the fund level.

III. Data

A. *Sample selection*

This study employs three data sources to construct main sample. The Statement of Additional Information (SAI) is a source of board information for a mutual fund such as director names, director ownership, director compensation, if a director is independent and their principal occupations during the past five years. The SAI is the part B of the registration statement which a mutual fund is required to file with SEC on an annual basis. Another source is the Semi-Annual Report (N-SAR) for fund information about what kind of investment practice restrictions a mutual fund imposes on (Item 70) and the management fee on a contract between a mutual fund and a fund manager (Item 48). The SEC requires a mutual fund to report N-SAR on a semi-annual basis. Both the SAI and the N-SAR are available electronically from SEC's EDGAR database. The third and last source is CRSP Survival-Bias Free Mutual Fund Database (CRSP). I gather fund information such as expense ratio, actual 12b-1 fee, actual management fee, institutional ownership, fund age, fund total net asset (TNA), fund object, fund return and fund portfolio holding.

I hand-collect the above information from the SAI and N-SAR either in the last report of each mutual fund on SEC EDGAR database before January 2, 2001 when the SEC amendment is announced or in the first report after July 1, 2002 when the amendment becomes effective. I also use fund information of mutual funds listed on CRSP between January 1997 and June 2006. I merge the three data sources in two steps: First, I match the SAI and N-SAR by Central Index Key (CIK) and use a fund name in N-SAR (Item 7) to create fund-level observations. Second, I merge the EDGAR-sourced sample with CRSP database by matching a fund name manually.[4] I combine different share classes under the same fund name into a single fund by computing the

[4]The SAI and N-SAR report at a Central Index Key (CIK) level. CIK is a 10-digit number used on the SEC to identify a corporation or an individual who have filed disclosure with the SEC. It is too noisy to construct sample at fund level based on CIK because it could be either at a fund level or a fund complex level. So, I use a fund name provided by N-SAR to create fund-level observations after matching the SAI and N-SAR by CIK. CRSP records data at a share class level with the name of a share class (fund_name) in the following format: [Registrant company name]:[Fund name];[Share class type], e.g., BlackRock Index Funds, Inc: BlackRock Small Cap Index Fund; Investor A Shares. To combine the SAI and N-SAR with CRSP, I refer a fund name to the second part of the share class name. In case of a fund name is missing, I use registrant company name instead.

asset-weighted average of the class-level variables. For comparison reason, I require that each fund observation has non-missing data on board composition and monthly return on both December 2000 and July 2002.

B. Summary statistics and variable description

This section conveys summary statistics and brief description for variables of interest. Table A1 lists the definitions of the variables in detail.

[Place Table I about here]

Table I presents summary statistics of variables used in this paper at the fund level. The sample consists of 5,564 unique funds from 452 fund families, covering 4,333 directors. The sample funds include 179 (5,385) mutual funds in a treatment (control) group which didn't constitute (constituted) a majority of independent director in a board before the SEC amendment of 2001. The sample funds managed $5.50 trillion total assets in 2000, 79.0 percent of all U.S. mutual funds[5].

B.1. Board information

The first part of Table I starts with the proportion of independent directors. Treated fund boards has experienced its increase from 0.47 to 0.68 by the SEC amendment of 2001. The difference between before and after the amendment is substantially significant, i.e., 0.21 with a t-statistic of 21.76. Controlled mutual funds, however, increase the proportion of independent board directors by 0.01 with t-statistics of 6.44.

Next, Table I reports descriptive statistics for working experience of directors. Directors' investment experience is about whether a director has working experience as a professional or private investor. A professional investor indicates that the director has worked in an investment company, and a private investor is for a director who is described as a private investor in the

[5]Investment Company Institute (ICI) reports the amount of total mutual fund assets is $6.96 trillion in 2000.

biographical information of the SAI. 26 percent of independent directors in the treatment group have investment experience before the 2001 amendment, and the portion of investment-experienced independent directors marginally falls to 23 percent after the 2001 amendment. The control group also has similar portion of independent directors with investment experience, 20 percent, and has no change across the grace period of the amendment. Most dependent directors has investment experience, regardless of treatment and control groups, because dependent directors are usually a fund manager or an executive of the fund complex.

In addition, both treated and controlled funds have about twenty percent of independent directors who has working experience in a finance industry except an investment company and about half of independent directors who do not have working experience in finance industry. Note that treated mutual funds have the portion of independent directors from a non-finance industry increased from 42 to 48 percent (t-stat=2.03) and the portion of dependent directors from a non-finance industry decreased from 10 to 6 percent (t-stat=2.58). Considering the board size is not changed in the adopting period, the statistical change suggests that treated funds usually comply the amendment by replacing its insider directors with independent directors who have working experience in a non-finance industry.

Independent chairmanship on a fund board has rarely been changed for both treatment and control groups in the SEC amendment: 12 percent of treated funds and 18 percent of controlled funds hold independent chairmanship on the board. The dollar value of fund shares owned by its directors is \$0.04 million of for treated funds and \$0.08 million for controlled funds.[6] The averaged age of directors across a fund board is around 55 and 60 for treated and controlled funds, respectively. The amount of compensation for directors is \$0.01 million and \$0.07 million for treated and controlled funds. Note that the huge gap in compensation between treated and controlled groups is because controlled funds are, on average, five times bigger than treated funds

[6]Table I reports directors' ownership in a fund they oversee only after the 2001 amendment because mutual funds start to document the information in the SAI on February 2001. For the rest of this paper, I assume that the director ownership before the amendment is the same as after the amendment. My rationale for the assumption is based on the finding of Chen, Goldstein, and Jiang (2008): Director ownership is virtually identical in 2002 and 2003. The finding suggests that the ownership of directors is likely constant over time. For the reason, I believe the constant assumption in director ownership does not cause serious issues in my analyses.

in terms of total net asset (TNA). The size difference between two groups may cause potential bias in difference-in-difference estimation, so I address this concern by using the propensity-score match in Section IV.A.

B.2. Performance information

The second part of Table I is about performance information. I employ four measures for fund performance including three return-related measures and two risk-related measures. I require four years of fund return history to compute the four performance measures. The first measure is the cumulative risk-adjusted fund return with respect to Fama-French (2015) five factors. The second measure is the return gap between fund return and portfolio return. I first compute the difference between quarterly cumulative FF5-adjusted fund return and the quarterly buy-and-hold FF5-adjusted return on a portfolio that invests in the most recently disclosed stock positions. Then, I take an average of the quarterly difference over four years before and after the amendment, i.e., 1997:Q1-2000:Q4 and 2002:Q3-2005:Q2. The third measure is the FF5-adjusted return on a portfolio disclosed most recently. Similar to the return gap, I compute the quarterly portfolio return first and average it over four years before and after the amendment. The fourth and last measure is about idiosyncratic risk of monthly fund return, calculated as the standard deviation of the residual from a regression of monthly fund returns on the Fama-French (2015) five-factor model.

The mean value of fund performance measures is almost the same for treated and controlled mutual funds except that idiosyncratic risk for treated funds is higher than for controlled funds. For example, the mean value of cumulative FF5-adjusted return is 0.03 for both groups of funds before the amendment, and it drops together to close to 0.00 after the amendment. However, the time trends for the measures are mixed: fund return, portfolio return, and idiosyncratic risk decrease, but return gap increase over time. The time trends can be partially explained by market-wide events like the dot-com bubble for 1994-2000 and the mutual fund scandal of 2003. The regressor of "After" in the equation (1) and (2) accounts for changes in the level of the U.S. captial markets over time. Note that the treated group has a lower t value for the difference between before and after

the SEC amendment, indicating that there is greater variation across treated mutual funds in the impact of the amendment on fund performance. The number of observations for fund performance measures is always less than board information variables because I impose a four-year minimum in estimating the performance measures. Also, the number of observations for the return gap and portfolio return is less than for fund return and idiosyncratic risk because some mutual funds like bond funds do not have portfolio information.

B.3. Fund information

The third and last part of Table I is about fund information. First, five versions of investment restriction measures are reported. The total number of restrictions on investment in the treated funds is 8.14 before the amendment, but it significantly fallss to 6.74 with t-statistics of 2.50 after the amendment. The control group also shows a similar pattern, but it relaxs, on average, 0.56 restrictions only. Following Almazan, *et al.* (2004), investment restriction items which can affect fund performance are decomposed into three categories: Derivative (Item 70B to Item 70I), Leverage (Item 70O, Item 70Q, and Item 70R), Illiquidity (Item 70J). The number of restrictions in the three categories are all significantly reduced after the amendment, particularly in the treatment group of mutual funds. I also construct a constraint score, termed as C-Score, proposed by Almazan, *et al.* (2004) and observe the same time trend as the other restriction measures: Greater reduction of a constraint score for treated funds than for controlled funds after the amendment. In this paper, I will mainly use the total number of investment practice restrictions as a proxy for the level of constraints a fund manager faces. Other restriction measures are not heavily discussed in the paper, but their test results are qualitatively the same as the reported results.

Then, I report statistics for fund fees including expense ratio, 12b-1 fee, management fee, and contractual management fee. Fund fee variables are constructed in two steps: I first obatin the amount of fund fees at the end of every month. Then, I take an average of the fund fees over four years before and after the amendment. By doing so, I can observe the change in the level of fund fees following the enhancement of board independency in 2001. I require four years of

fund return history when computing the fee variables. Expense ratio and its detailed items are not significantly changed in the treatment group after the SEC amendment, while the control group of mutual funds raise the expense ratio with more spending on 12b-1 plans and other operating cost. Note that management fee provided by CRSP can be offset by fee waivers and reimbursements and, therefore, it can be lower than management fee on a contract, depending on the reaction of fund investors to their past performance. To idenfity the role of independent directors in adjusting the level of management fee, I gather information on contractual management fee from N-SAR, termed as K-mgmt Fee. The management fee on a contract marginally increases in treated funds, while it shows no change in controlled funds.

Other variables regarding fund information are following. There is no significant change in institutional ownership for both groups of mutual funds. Institutional ownership is calculated as the total net asset of institutional class in a fund divided by the total net asset of the fund. The treated mutual funds are about two years younger than the controlled. Lastly, treated funds are well-diversified: treated funds compose roughly sixty percent of equity funds, thity percent of fixed income funds, and ten percent of index funds. Controlled mutual funds also have well-diversified composition. Also, the fund objective has not been changed around the SEC amendment of 2001.

IV. Results

In Section IV.A, I confirm the averaged effect of an exogenous enhancement in board independence on fund performance as well as how its effect varies with investment experience of independent directors on a fund board. In Section IV.B and IV.C, I explore additional difference-in-difference analyses to assess what causes the estimated treatment effect. Speicifically, I examine the change in investment contraints a fund manager faces and the change in the association of contractual management fee with fund performance. In Section IV.D, I conduct several robustness tests.

A. *Baseline*

[Place Table II about here]

Table II presents the main results from the regression model of (1) and (2). My primary purpose is to examine how the improvement of board independence affects fund performance, depending on investment experience of independent directors: On averge, treated mutual funds should improve fund performance relative to non-treated mutual funds after the amendment when they have investment-experience independent directors on a fund board. I first test if enhanced board independence affects cumulative return and idiosyncratic risk unconditionally. Column 'Unconditional' of Table II reports the estimated coefficients of estimating equation of (1) without control variables in Panel A and with control variable in Panel B.[7] Consistent with the prior literature, I do not find a significant relation between board independence and performance, regardless of adding the control variables. For example, the difference-in-difference (DiD) coefficients, β_3, are statistically insignificant in Panel A: 0.007 for cumulative return (t-stat=0.22) and 0.020 for idiosyncratic risk (t-stat=0.64).

The next columns contain my cental results. In Column 'Conditional', I allow the effect of board independence to depend on investment experience of independent directors by introducing interaction terms with their experience. Recall that the investment experience of independent directors is the portion of independent directors on a fund board who have working experience as a professional or private investor. Two important findings emerge from these estimates. First, the estimated coefficient on the interaction term, β_6, is positive and significant for cumulative return. The conditional DiD coefficient in Column 'Conditional' is 0.314 with t-statistics of 2.71, indicating that the improvement in board independence among treated funds causes fund return to increase 1.98% per year when treated funds have independent directors with investment experience.[8] Even after adding control variables, the conditional coefficient is still positive and

[7] I also replicate Table II, removing fund fixed effect or restricting my sample to mutual funds which survive for entire estimation period from 1997 to 2006. The results are qualitatively the same as Table II.

[8] The economic significance is calculated as follows. The average portion of experienced independent directors is

different from zero at high level of statistical significance. Second, the estimates reveal that the improved board independency has a negative impact on fund return for certain funds which do not have experienced independent directors on a board. The DiD coefficient, β_3, in the equation (2) is -0.074 with a t-value of -2.51 in Panel A and -0.054 with a t-value of -1.79 in Panel B. The outcome mirrors recent theories and empirical research that infer the cost of an independent board when it is informationally constrained.[9] I do not find a significant relation between idiosyncratic risk and the improvement in fund board independency, regardless of the presence of control variables.

Table II provides evidence that the increased proportion of independent directors has a material impact on fund performance, conditional on their investment experience. Independent directors seem to boost fund return when they have investment experience, and they damage when they do not have the experience, but their positive and negative impact cancel out on average. One interpretation of the evidence is that the working experience as a professional or private investor helps them to overcome the inherent information disadvantage of independent directors as outsiders and, therefore, they can govern fund management effectively. Prior studies have failed to figure out the substantial effect of board independence. One potential reason is that they have examined the unconditional effect of board independence which is statistically indifferent from zero in my sample. Another possible reason can be due to my empirical identification strategy. I employ the SEC amendment of 2001 as an exogenous shock in the degree of board independence among treated funds. Without using such an exogenous shock, evidence documented in previous literature may be subject to potential bias rooted in endogeneity of board composition and fund performance.

[Place Figure 2 about here]

I graphically illustrate the conditional effect of board indepedence in Figure 2. It plots cumulative return for treated (controlled) funds with versus without independent directors who has

0.26 on a treated fund board, and the estimation period of cumulative fund return is four years. Therefore, the enhanced board independence is, on average, associated with 1.98% higher annual return ($= \sqrt[4]{1 + (0.314 \times 0.26)} - 1$) among treated funds with experienced independent directors.

[9] Adams and Ferreira (2007) and Harris and Raviv (2008) provide theoretical models to prove that a board controlled by insiders, rather than independent directors, can be optimal for firm value due to their information advantage. Duchin, Matsusaka, and Ozbas (2010) empirically prove independent directors are less effective in worse information environment.

investment experience on a board. Consistent with Table II, the left plot of Figure 2 reflects the increasing return difference between treated funds with and without investment-experience independent directors: -0.50% in the grace period of the amendment from January 2001 to June 2002 (t-stat=0.75), -0.50% in the first year after the amendment (t-stat=0.38), 2.83% in the second year (t-stat=1.95), 4.55% in the third year (t-stat=2.65), and 9.24% in the fourth year (t-stat=3.79). The return difference between controlled funds has qualitatively the same time trend with much smaller variation, ranging from -0.40% in the grace period to 2.64% in the fourth year. Overall, this figure shows how investment experience of independent directors makes an economically significant increase in cumulative return of treated mutual funds relative to controlled mutual funds after the amendment.

Next, I repeat my baseline tests on portfolio-based performance measures such as the return gap and portfolio return. I note that the return gap can partially capture the trading ability of fund managers, and the return of a portfolio represents their stock-picking ability (Kacperczyk, Sialm, and Zheng, 2008). In line with the thought, I aim to clarify which ability is most prominently improved by the enhanced independency.

[Place Table III about here]

Table III presents the outcome of re-estimating equation (1) and (2) using the portfolio-based measures as dependent variables. The regression specifications are the same as Table II, but I only report coefficients of interest for brevity's sake. Looking across Panel A and Panel B and focusing on the three-way interaction term in Column 'Conditional', the estimates indicate that the return gap is significantly increased following the independency enhancement, if a fund board has investment-experience independent directors and the return gap drops otherwise. One message from the table is that the trading ability of a fund manager, captured by the return gap, is primarily improved or damaged by the enhanced independency, depending on the presence of experienced independent directors on a fund board. These results suggest it is possible that the quality of trading environment managed by a fund board would depend on investment experience of independent directors. I will

explore the possibility using the number of investment practice restrictions in Section IV.B and the association of management fee on a contract with fund return in Section IV.C.

[Place Table IV about here]

I implement a difference-in-difference matching estimator to address unobservable heterogeneity between the treatment and control groups of mutual funds. Specifically, I match each treated fund to a set of control funds using all the control variables in Table II. First, I run a logit regression of an indicator variable for whether a particular fund is classified as treated or controlled on my matching variable on December 2000. The estimated coefficients from the logit regression are used to estimate probabilities of treatment for each fund in the sample. Second, these probabilities are used to perform a nearest neighbor match. I match with replacement using a standard tolerance of 0.005 caliper and allowing for up to four unique matches per treated fund. As a consequence, I can reconstruct my sample with 99 treated funds and 366 matched control funds.

Table IV shows the results from the matching sample. Panel A displays the descriptive statistics for the treatment and matched control samples. The number of treated funds are 99, less than the total number of treated funds in my sample, i.e., 179, because they are required not to have any missing variables in the propensity matching analysis. Also, the number of matched control funds drops from 396 ($= 99 * 4$) to 366 because some treated funds do not have four unique matches within the standard tolerance of 0.005 caliper. Importantly, the descriptive statistics in Panel A indicate that, at least for the variables I match on, treated funds are not statistically differentiable from matched control funds. This is a clear indication that the matching scheme performs well.

Panel B of Table IV displays the impact of board independence on fund performance, conditional on independent directors' investment experience. The first and second rows present the DiD matching coefficient of β_3 in the equation (1) and β_6 in the equation (2), respectively. The estimators produces quantitatively similar estimated coefficients of the average treatment effect. The results indicate that my key findings in Table II and Table III are robust and not driven by heterogeneity between treatment and control groups.

B. Investment practice restriction

In this section, I examine whether board independence enhanced by the SEC amendment in 2001 reduces restrictions on investment activities, depending on investment experience of independent directors. A fund board of directors can use investment restrictions to fill the gap of their monitoring ability by prohibiting certain types of investment practices like investing in options or futures, purchasing restricted securities, borrowing of money, purchasing securities on margin, or short-selling (Almazan, *et al.*, 2004). Imposing such investment restrictions, however, may cause investment advisors to lose some chances of timely investment. Therefore, as the monitoring ability of independent directors is improved, they are less likely to bind investment advisors by restrictions. Independent directors with investment experience can be better informed and can more effectively monitor fund management because they are likely to have investment-specific knowledge, skills, and connections. Accordingly, when an independent board has independent directors with investment experience, the fund board is less likely to constrict the trading practices of a fund manager.

[Place Figure 3 about here]

Figure 3 illustrates the change of investment practice restrictions around the SEC amendment. I count the number of investment restrictions for a fund at the end of each year and take an average across four groups of mutual funds: a treatment (control) group of mutual funds with and without investment-experience independent directors. The figure depicts the time trend in the number of investment restriction items every year during pre-amendment period (1997-2000) and post amendment period (2002-2005). Table I reports that the treatment group of mutual funds decreases 1.40 out of eighteen investment restrictions in the grace period of the 2001 SEC amendment, while the control group decreases 0.56 restrictions only. Figure 3 shows the decrease of investment restrictions in the treatment group is mainly attributed to treated mutual funds with at least one independent director with investment experience. Specifically, mutual funds with experienced independent directors in the treatment group reduce the number of restricted investment activities by 2.74, while other treated mutual funds reduce it by 0.20. Similar to treated funds without

experienced independent directors, controlled funds with and without experienced independent directors drop it by 0.86 and 0.26, respectively.

[Place Table V about here]

Table V presents the effects of the SEC amendment in 2001 on investment practice restrictions, conditional on investment experience of independent directors. I examine it by replacing fund performance measures with the number of restricted investment activities on the left-hand side of (1) and (2). Column 1 of Table V indicates that the overall effect of improved board independence is to ease constraints on fund managers, consistent with Almazan, *et al.* (2004). The estimated coefficient is -0.911 with a t-value of -2.17. Notably, the result of Column 3 indicates that the DiD coefficient, β_3, is insignificant but the conditional DiD coefficient, β_6, is negative and statistically significant. The estimates on the DiD terms in Column 3 are 0.784 for β_3 (t-stat=1.36) and -6.674 for β_6 (t-stat=-4.30), indicating that the negative effect is largely attributed to treated funds which has investment-experience independent directors on a fund board. After adding control variables, Column 2 and 4 of Table V also indicate that the fund board reduces the number of investment practice restrictions only when it has independent directors with investment experience, which is consistent with Figure 3. This confirms that independent directors with investment experience may provide fund managers better investment environment by relaxing investment restrictions.

C. Management fee on a contract

Next, I examine whether the association of contractual management fee with fund performance is changed by enhanced board independence with respect to investment experience of independent directors. Without market friction, all mutual funds are supposed to generate zero expected after-fee risk-adjusted returns in equilibrium. Otherwise, there would be positive (negative) cash flow for funds with positive (negative) expected after-fee risk-adjusted returns (Berk and Green, 2004). Experienced independent directors are better informed, so they can properly evaluate funds' alpha and fairly reflect into management fee. The board action made by independent directors can be

directly measured in management fee on a contract. Therefore, I expect contractual management fee to be alingned more, or at least flatter, with fund performance when a fund board has independent directors with investment experience.

I first measure the relation between after-fee risk-adjusted fund return and management fee on a contract for four years before and after the SEC amendment in 2001 by using the following regression equation,

$$\text{FF5-Adjusted Fund Return}_{i,m} = \alpha_i + \beta_i \text{ Management Fee on a Contract}_{i,m} + \epsilon_{i,m}. \quad (3)$$

For example, I regress the risk-adjusted fund return in the first half of 1999 on contractual management fee reported in the last Semi-Annual Report (SAR) of 1998. I focus on the coefficient of interest, β_i, which should become more positive, or at least flatter, after the amendment for better-informed funds.

[Place Table VI about here]

Table VI presents the effects of the SEC amendment in 2001 on the association of contractual management fee with fund return, conditional on investment experience of independent directors. I examine it by using regression specification of (1) and (2) after replacing the dependent variable with β_i of equation (3). Column 1 and 2 of Table VI indicates that the overall effect of improved board independence is to exacerbate the relation between fund performance and contractual management fee. The estimated coefficient is -0.087 with a t-value of -1.88. Notably, the result of Column 3 and 4 also shows that the DiD coefficient, β_3, is negative and significant at 10 percent significance, indicating the negative relation is largely attributed to treated funds which do not has investment-experience independent directors on a fund board. In sharp contrast, the conditional DiD coefficient, β_6, on Column 3 and 4 is positive. The estimates on the DiD terms in Column 3 are 0.144 (t-stat=0.69). After adding control variables, the conditional DiD terms in Column 4 is positive and even significant. These results suggests that the fund board sets the management fee on a contract properly reflecting the ability of a fund manager only when it has independent directors

with investment experience.

D. Robustness tests

In this section, I report the results of several robustness exercises. First, I explore endogenous concerns regarding investment experience of independent directors, defined as the proportion of independent directors with investment experience in a fund board who exist in 2000 before the SEC amendment. It would be possible that investment experience of independent directors who are newly hired or resigned after 2000 may affect the effect of board independence on fund performance. If it is the case, one may interpret my main findings as meaning that fund performance improves in response to a change in the proportion of independent directors with investment experience, rather than an increase in the proportion of independent directors. To address that concern, I compare the effect of board independence, conditional on investment experience of independent directors who (1) hold the position, (2) get hired, and (3) are resigned in the grace period of the 2001 amendment.

[Place Table VII about here]

The results are reported in Table VII. I define three variables first: the faction of independent directors on a fund board who who (1) hold the position, termed as 'Existing Indep Inv Exp', (2) get hired, termed as 'New Indep Inv Exp', and (3) are resigned, termed as 'Resigned Indep Inv Exp', in the grace period of the 2001 amendment. I then estimate my baseline model, allowing the treated effect to differ among these three groups of independent directors. The focal estimates indicate that the effect of the amendment is concentrated on independent directors who exist before the SEC amendment. For this group of independent directors, the estimated DiD coefficients for fund return and the return gap are positive and significant, regardless of control variables. This is not the case for independent directors who are resigned during the grace period. The estimated coefficient for newly elected independent directors is positive and significant for fund return only in Panel B. Thus, the test results suggest that my main findings are mainly driven by independent directors who keep holding the director position in the period, while newly hired independent

directors marginally influence the effectiveness of board independence and resigned independent directors have statistically no influence.

Next, it would be possible that independent directors without investment experience may affect the effect of board independence on fund performance. For example, they can provide material inside information to fund managers, using their working experience in non-finance industries (Dass, *et al.*, 2014). If it is the case, the interpretation of my findings is much complicated. Taking this concern into consideration, I compare the effectiveness of board independence, conditional on independent directors with (1) investment experience, (2) working experience in the finance industry except an investment company, and (3) working experience in non-finance industries.

[Place Table VIII about here]

The comparison results are reported in Table VIII. Similar to the previous robustness test, I first construct three additional variables: the fraction of independent directors with with (1) investment experience, termed as 'Indep Inv Exp', (2) working experience in the finance industry except an investment company, termed as 'Indep Fin-But-Inv Exp', and (3) working experience in non-finance industries, termed as 'Indep Non-Fin Exp'. Then, I conduct the baseline analysis based on the three groups of independent directors. The point estimates indicate that the effect of improved board independence exclusively results from independent directors with investment experience. For this group of independent directors, the estimated DiD coefficients, β_6, for fund return and the return gap are positive and significant in both Panel A (Without control variable) and Panel B (With control variable). For the other groups of independent directors, the conditional DiD estimates are always negative for fund return and the return gap. Therefore, the results suggest that independent directors with investment experience play a major role to enhance the effectiveness of board independence, while independent directors with other types of working experience marginally hurt.

V. Conclusion

Independent directors play a vital role in fund management. Despite of the importance, prior studies have failed to find significant relation between board independence and fund performance so far. The SEC amendment of 2001 requires mutual funds to raise the minimum proportion of independent directors on a fund board from 40 percent to a majority. Taking advantage of the largely exogenous shock in board independency, I mitigate the endogeneity issues that has disturbed previous attempts to estimate the effect of board independence. My main finding is that the role of independent directors matters in fund performance, but the direction of their effect varies with their investment experience. Independent directors with investment experience can be better informed because they are likely to have knowledge on the nature of investment activities, skills to process financial information, and connections to provide full information for fund management. Consistent with the notion, I find that improved board independency is associated with significantly better fund performance when a fund board has independent directors with investment experience, while it is negatively associated with fund performance when a fund board does not have. These findings suggest that the failure of privious studies to find the impact of board independence on fund performance may result from the failure to separate the positive and negative effect of board independence.

The governance environment in the mutual fund industry has been changing from early 2000s when the amendment becomes effective. Independent directors can hire independent staffs who can closely observe the management of mutual funds and directly report to the directors on compliance matters as well as independent legal counsels which can provide adequate legal advice on the resolution of conflicts between fund shareholders and a fund manager. Those newly adopted rule may lessen the concern regarding the information constraint of independent directors. Nonetheless, most independent directors should still monitor multiple funds at quarterly meetings and a fund manager is frequently in a position to have a monopoly over information about fund operation. Therefore, although my findings are supposed to be interpreted with a caution, they still have significant implication on the role of board independence even in the recent period.

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Figure 1. Proportion of Independent Fund Directors Before and After the SEC amendment of 2001 This figure illustrates the change in the proportion of independent directors on a fund board before and after the SEC amendment of 2001, including 95 percent confidence intervals on the top. The sample includes all mutual funds listed on SEC's EDGAR database on December 2000, termed as "Before", and July 2002, termed as "After", which have information on the CRSP Mutual Fund Database. This figure shows the amendment significantly increases the proportion of independent directors in treated mutual funds relative to controlled mutual funds.

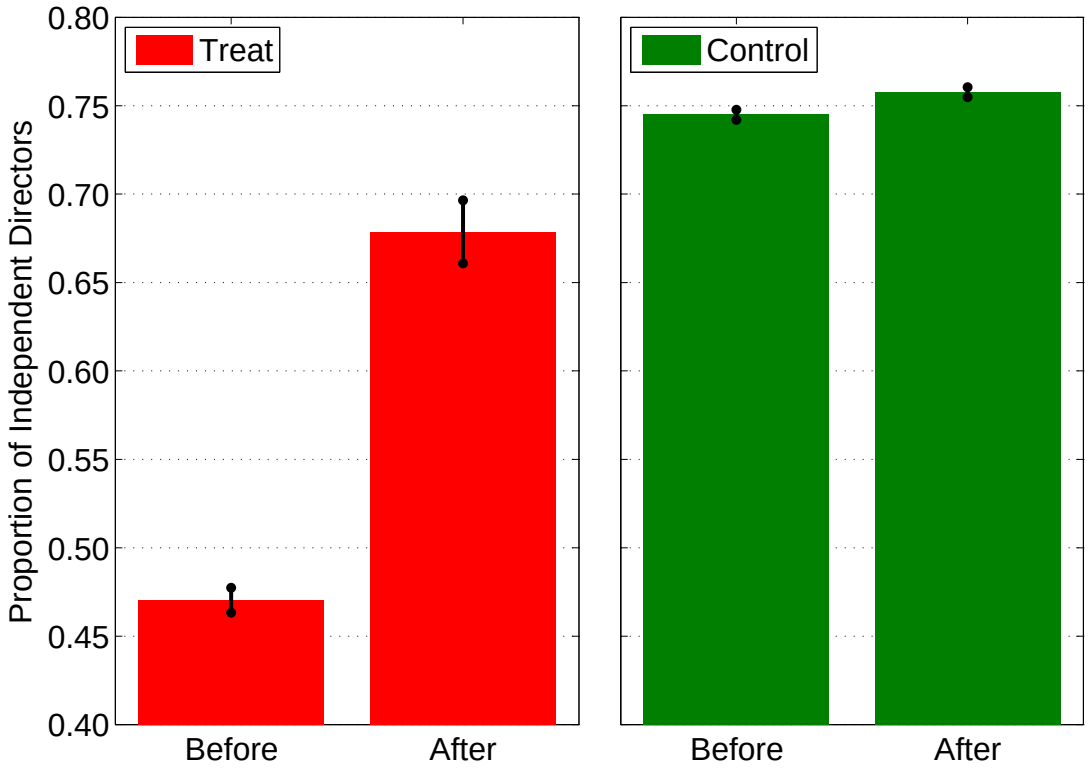

Figure 2. Fund Cumulative Return Over Time These figures plot fund cumulative return from January 2001 to June 2006 for four groups of mutual funds with 95 percent confidence intervals around them: The left (right) figure displays cumulative return for treated (controlled) mutual funds with versus without investment-experience independent directors on a board. The time period between January 2001 and June 2002 is the grace period of the SEC amendment. The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002 which have information on the CRSP Mutual Fund Database. This figure shows how investment experience of independent directors makes an economically meaningful increase in cumulative return of treated mutual funds relative to controlled mutual funds after the amendment.

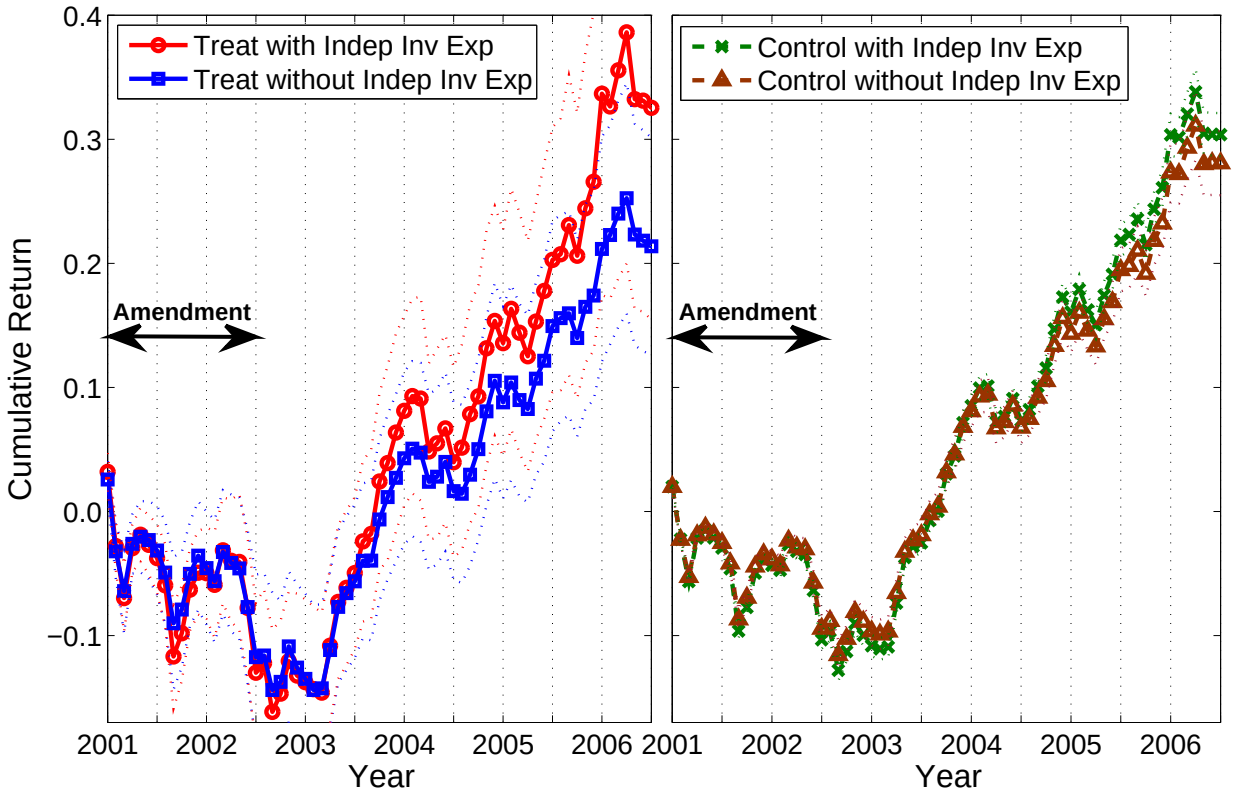

Figure 3. **Investment Practice Restriction Over Time** These figures depict the time trend in the number of investment restriction items. With 95 percent confidence intervals, I plot the average number of restriction items for 1997-2005 for treated (controlled) mutual funds with and without investment-experience independent director on a board. The time period between January 2001 and June 2002 is the grace period of the SEC amendment. The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002 which have information on the CRSP Mutual Fund Database.

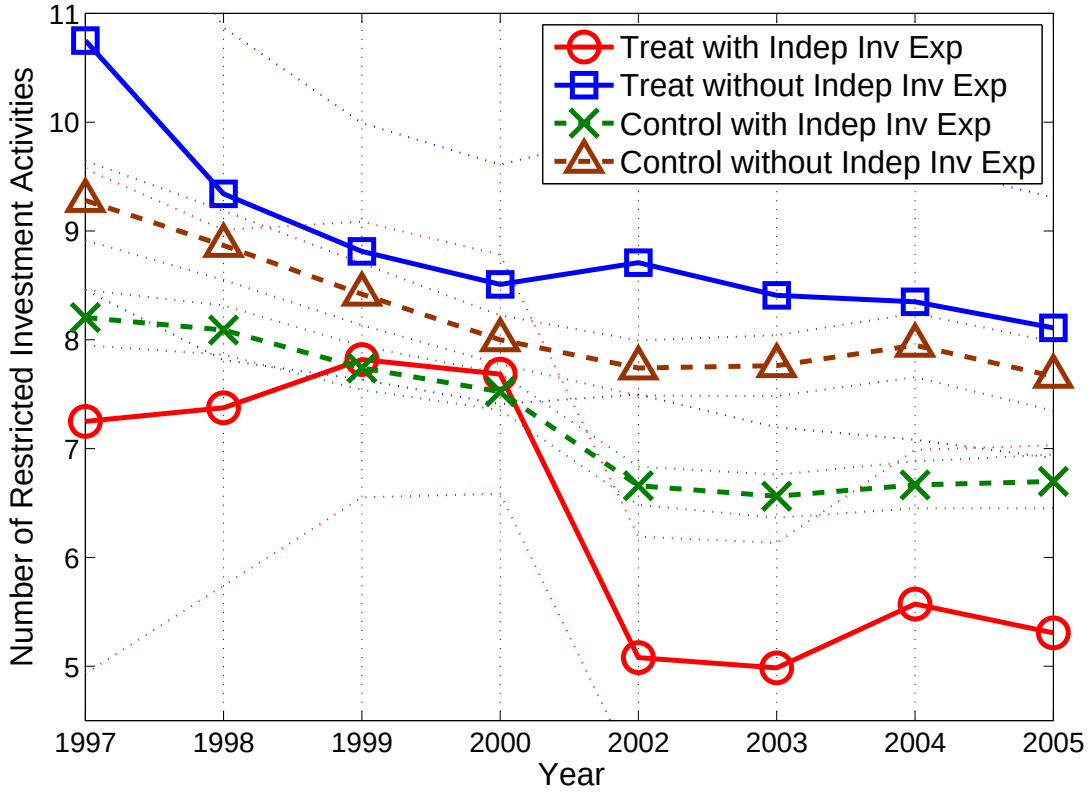

Table I. Summary Statistics

This table presents summary statistics for treatment and control groups of mutual funds on December 2000 before the SEC amendment of 2001. The sample includes all mutual funds listed on SEC's EDGAR database on December 2000, termed as "Before", and July 2002, termed as "After", which have information on the CRSP Mutual Fund Database. Statistics for treated (controlled) funds are reported in the top (bottom) row for each variable. All variables are defined in Table A1. Stardard deviation and values at 25, 50, 70 percentiles are statistics before the amendment. t-statistic of difference in mean before and after the amendment is from a non-pair test assuming unequal variances.

	Mean									
Variable	#	Before	#	After	Diff	t	Std Dev	P25	P50	P75
(1) *Board Information*										
Indep Dir Proportion	179	0.47	179	0.68	0.21	(21.76)	0.05	0.43	0.50	0.50
	5,385	0.74	5,385	0.76	0.01	(6.44)	0.11	0.67	0.75	0.80
Dir Inv Experience										
- Indep Director	179	0.26	179	0.23	-0.03	(-1.08)	0.30	0.00	0.33	0.50
	5,385	0.20	5,385	0.20	0.00	(0.28)	0.19	0.00	0.20	0.33
- Dep Director	179	0.88	179	0.84	-0.04	(-1.46)	0.17	0.67	1.00	1.00
	5,385	0.83	5,385	0.86	0.04	(6.14)	0.31	0.67	1.00	1.00
Dir Fin-but-Inv Exp										
- Indep Director	179	0.21	179	0.23	0.03	(1.03)	0.24	0.00	0.00	0.50
	5,385	0.23	5,385	0.24	0.00	(0.98)	0.21	0.09	0.20	0.33
- Dep Director	179	0.02	179	0.02	0.00	(0.15)	0.08	0.00	0.00	0.00
	5,385	0.03	5,385	0.02	-0.01	(-6.92)	0.13	0.00	0.00	0.00
Dir Non-fin Exp										
- Indep Director	179	0.42	179	0.48	0.06	(2.03)	0.32	0.00	0.50	0.67
	5,385	0.50	5,385	0.51	0.01	(2.08)	0.25	0.33	0.50	0.67
- Dep Director	179	0.10	179	0.06	-0.04	(-2.58)	0.16	0.00	0.00	0.25
	5,385	0.07	5,385	0.07	-0.01	(-2.56)	0.20	0.00	0.00	0.00
Indep Chair	179	0.12	179	0.12	0.00	(0.00)	0.33	0.00	0.00	0.00
	5,385	0.18	5,385	0.18	-0.01	(-0.83)	0.39	0.00	0.00	0.00
Board Size (#)	179	5.46	179	5.46	0.00	(0.00)	1.83	4.00	6.00	6.00
	5,385	8.06	5,385	8.10	0.03	(0.62)	2.92	6.00	8.00	10.0
Indep Ownership (M$)	-	-	130	0.04	-	-	0.04	0.01	0.03	0.10
	-	-	4,673	0.08	-	-	0.03	0.06	0.08	0.10
Dep Ownership (M$)	-	-	130	0.08	-	-	0.12	0.03	0.10	0.10
	-	-	4,673	0.08	-	-	0.04	0.09	0.10	0.10
Director Age (Yr)	179	55.4	179	56.7	1.31	(1.96)	6.44	51.2	55.4	61.0
	5,385	60.6	5,385	61.1	0.50	(5.73)	4.67	58.1	60.9	63.9
Compensation (M$)	139	0.01	155	0.02	0.00	(1.74)	0.02	0.01	0.01	0.01
	4,676	0.07	4,741	0.09	0.02	(12.35)	0.06	0.02	0.06	0.10
(2) *Performance Information*										
FF5-Adj Cum Return	105	0.03	147	0.00	-0.03	(-1.18)	0.23	-0.05	0.02	0.09
	3,876	0.03	4,462	-0.01	-0.04	(-9.10)	0.19	-0.05	0.01	0.08
FF5-Adj Return Gap	70	0.02	98	0.02	0.01	(2.71)	0.02	0.01	0.01	0.02
	1,790	0.02	2,291	0.03	0.01	(10.46)	0.03	0.00	0.01	0.02
FF5-Adj Port Return	70	-0.01	98	-0.02	-0.01	(-4.10)	0.02	-0.02	-0.01	0.01
	1,790	-0.01	2,291	-0.02	-0.01	(-15.68)	0.03	-0.01	-0.01	0.00
FF5 Idio Risk	105	0.50	147	0.34	-0.16	(-3.68)	0.39	0.22	0.44	0.68
	3,876	0.41	4,462	0.28	-0.13	(-17.17)	0.39	0.14	0.27	0.58

(Continued)

Table I – *Continued*

Variable	Mean #	Mean Before	Mean #	Mean After	Diff	*t*	Std Dev	P25	P50	P75
(3) *Fund Information*										
Restriction (#)	161	8.14	163	6.74	-1.40	(-2.50)	4.93	3.00	8.00	13.0
	4,815	7.67	4,965	7.11	-0.56	(-5.75)	4.75	3.00	7.00	12.0
- Derivative (#)	161	4.20	163	3.43	-0.78	(-2.11)	3.37	1.00	5.00	8.00
	4,817	4.06	4,970	3.79	-0.28	(-4.42)	3.06	1.00	4.00	8.00
- Leverage (#)	161	1.72	163	1.45	-0.27	(-2.80)	0.75	1.00	2.00	2.00
	4,815	1.82	4,966	1.75	-0.07	(-4.70)	0.79	1.00	2.00	2.00
- Illiquidity (#)	161	0.26	163	0.18	-0.08	(-1.66)	0.44	0.00	0.00	1.00
	4,817	0.15	4,970	0.14	-0.01	(-1.34)	0.35	0.00	0.00	0.00
- C-Score	161	0.45	163	0.37	-0.09	(-2.67)	0.28	0.22	0.47	0.57
	4,815	0.42	4,966	0.40	-0.02	(-4.53)	0.25	0.24	0.39	0.56
Expense Ratio (%)	105	1.18	147	1.32	0.14	(1.43)	0.68	0.72	1.05	1.46
	3,872	1.04	4,460	1.09	0.05	(2.64)	0.64	0.65	0.95	1.34
- 12b-1 Fee (%)	105	0.09	147	0.11	0.02	(0.71)	0.17	0.00	0.00	0.08
	3,872	0.18	4,460	0.20	0.02	(2.86)	0.25	0.00	0.05	0.27
- Mgmt Fee (%)	105	0.58	147	0.48	-0.10	(-0.77)	0.66	0.40	0.70	0.94
	3,869	0.54	4,460	0.54	0.00	(0.55)	0.38	0.36	0.52	0.75
- K-Mgmt Fee (%)	90	0.71	125	0.77	0.07	(1.63)	0.28	0.50	0.75	0.83
	2,911	0.56	3,477	0.56	0.00	(-0.48)	0.32	0.38	0.53	0.75
Inst Ownership	179	0.26	179	0.27	0.00	(0.02)	0.43	0.00	0.00	0.65
	5,385	0.26	5,385	0.26	0.00	(-0.47)	0.42	0.00	0.00	0.69
Fund Age (Yr)	179	6.35	179	8.33	1.98	(2.55)	7.38	3.00	4.00	8.00
	5,385	8.43	5,385	10.35	1.92	(11.95)	8.40	3.00	6.00	11.0
Fund TNA (B$)	179	0.24	179	0.34	0.11	(0.75)	0.89	0.02	0.05	0.16
	5,385	1.01	5,385	0.96	-0.05	(-0.63)	3.92	0.04	0.15	0.56
Int'l Equity Fund	179	0.09	179	0.09	0.00	(0.00)	0.29	0.00	0.00	0.00
	5,385	0.12	5,385	0.12	0.00	(0.00)	0.32	0.00	0.00	0.00
Dom Equity Fund	179	0.53	179	0.53	0.00	(0.00)	0.50	0.00	1.00	1.00
	5,385	0.36	5,385	0.36	0.00	(0.00)	0.48	0.00	0.00	1.00
Fix Income Fund	179	0.30	179	0.30	0.00	(0.00)	0.46	0.00	0.00	1.00
	5,385	0.43	5,385	0.43	0.00	(0.00)	0.50	0.00	0.00	1.00
Mixed Fund	179	0.07	179	0.07	0.00	(0.00)	0.26	0.00	0.00	0.00
	5,385	0.07	5,385	0.07	0.00	(0.00)	0.26	0.00	0.00	0.00
Index Fund	179	0.08	179	0.08	0.00	(0.00)	0.28	0.00	0.00	0.00
	5,385	0.04	5,385	0.04	0.00	(0.00)	0.20	0.00	0.00	0.00

Table II. Fund Performance on Board Independence

This table presents the effect of the SEC amendment in 2001 on fund performance, conditional on investment experience of independent directors, using the regression specifications of (1) and (2). The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002, which have information on the CRSP Mutual Fund Database. All variables are defined in Table A1. Panel A and Panel B report the coefficient estimates from the regression models without and with control variables, respectively. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Without control variable				
	Unconditional		Conditional	
	Cum Return	Idio Risk	Cum Return	Idio Risk
Treat × After	0.007	0.020	-0.074**	0.055
	(0.22)	(0.64)	(-2.51)	(1.37)
Treat	-0.000	0.117***	0.016*	0.101***
	(-0.00)	(7.27)	(1.86)	(5.20)
After	-0.035***	-0.081***	-0.038***	-0.084***
	(-7.62)	(-14.02)	(-5.92)	(-10.36)
Treat × After × Indep Inv Exp			0.314***	-0.104
			(2.71)	(-0.79)
Treat × Indep Inv Exp			-0.060**	-0.174**
			(-2.18)	(-2.48)
After × Indep Inv Exp			0.013	-0.015
			(0.50)	(-0.51)
Indep Inv Exp			0.009*	0.233***
			(1.86)	(21.18)
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.012	0.031	0.014	0.085
Num of Observations	8,590	8,590	8,590	8,590

Table II – *Continued*

Panel B. With control variable

	Unconditional		Conditional	
	Cum Return	Idio Risk	Cum Return	Idio Risk
Treat × After	0.033	-0.016	-0.054*	0.001
	(0.92)	(-0.44)	(-1.79)	(0.02)
Treat	-0.017**	0.014	-0.007	-0.015
	(-2.30)	(0.68)	(-0.73)	(-0.65)
After	-0.030**	-0.108***	-0.040***	-0.113***
	(-2.57)	(-12.36)	(-3.21)	(-10.83)
Treat × After × Indep Inv Exp			0.392**	-0.085
			(2.35)	(-0.42)
Treat × Indep Inv Exp			-0.050	0.139
			(-1.30)	(1.18)
After × Indep Inv Exp			0.054*	0.022
			(1.75)	(0.68)
Indep Inv Exp	0.004	0.064***	0.003	0.055***
	(0.55)	(3.86)	(0.34)	(3.44)
Dep Inv Exp	0.004	0.059***	0.004	0.061***
	(1.32)	(9.98)	(1.35)	(10.17)
Indep Chair	0.002	0.007	0.002	0.008
	(0.81)	(1.17)	(0.78)	(1.36)
Board Size	-0.000	0.001	-0.000	0.001
	(-0.89)	(1.07)	(-0.71)	(0.97)
Dir Age	0.000	0.001	0.000	0.001
	(0.98)	(0.92)	(0.82)	(0.91)
Compensation	-0.013	-0.123	-0.028	-0.131
	(-0.18)	(-1.47)	(-0.39)	(-1.56)
Indep Ownership	-0.115***	-0.139*	-0.111***	-0.134*
	(-2.72)	(-1.92)	(-2.60)	(-1.85)
Dep Ownership	0.061*	-0.027	0.059	-0.028
	(1.71)	(-0.48)	(1.57)	(-0.50)
Inst Ownership	0.005*	0.010	0.005**	0.011
	(1.93)	(1.51)	(1.97)	(1.56)
Fund Age	-0.003	0.013***	-0.003	0.013***
	(-0.59)	(2.84)	(-0.57)	(2.91)
Fund TNA	0.013***	0.012***	0.013***	0.012***
	(4.11)	(4.74)	(4.09)	(4.71)
Expense Ratio	0.003	0.034***	0.002	0.034***
	(1.14)	(4.00)	(1.08)	(3.98)
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.016	0.123	0.021	0.123
Num of Observations	6,808	6,808	6,808	6,808

Table III. Portfolio-Related Fund Performance and Board Independence

This table presents the effect of the SEC amendment in 2001 on portfolio-related performance, conditional on investment experience of independent directors, using the regression specifications of (1) and (2). The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002, which have information on the CRSP Mutual Fund Database. All variables are defined in Table A1. For brevity, I report difference-in-difference estimators only. Panel A and Panel B report the coefficient estimates from the regression models without and with control variables, respectively. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

	Unconditional		Conditional	
	Ret Gap	Port Ret	Ret Gap	Port Ret
Treat × After	0.001	-0.002	-0.006	-0.003
	(0.23)	(-0.53)	(-1.59)	(-0.62)
Treat	0.005***	-0.003***	0.006***	-0.004***
	(4.84)	(-2.99)	(4.71)	(-2.69)
After	0.014***	-0.016***	0.014***	-0.015***
	(16.80)	(-19.99)	(12.61)	(-14.42)
Treat × After × Indep Inv Exp			0.028**	0.003
			(2.29)	(0.20)
Treat × Indep Inv Exp			-0.020***	0.011**
			(-5.26)	(2.48)
After × Indep Inv Exp			-0.003	-0.001
			(-0.93)	(-0.29)
Indep Inv Exp			0.016***	-0.010***
			(13.47)	(-9.90)
Control Variable	No	No	No	No
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.088	0.122	0.118	0.134
Num of Observations	4,249	4,249	4,249	4,249

Panel B. With control variable

	Unconditional		Conditional	
	Ret Gap	Port Ret	Ret Gap	Port Ret
Treat × After	-0.002	0.003	-0.011**	0.002
	(-0.55)	(0.63)	(-2.32)	(0.42)
Treat	-0.002	-0.000	-0.001	-0.001
	(-1.30)	(-0.14)	(-0.43)	(-0.67)
After	0.010***	-0.013***	0.010***	-0.013***
	(4.57)	(-7.52)	(4.27)	(-6.81)
Treat × After × Indep Inv Exp			0.032**	0.002
			(2.56)	(0.14)
Treat × Indep Inv Exp			-0.003	0.003
			(-0.64)	(0.59)
After × Indep Inv Exp			0.002	-0.002
			(0.41)	(-0.39)
Indep Inv Exp	0.005***	-0.003*	0.005***	-0.003*
	(2.98)	(-1.72)	(2.73)	(-1.67)
Control Variable	Yes	Yes	Yes	Yes
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.131	0.145	0.132	0.145
Num of Observations	3,339	3,339	3,339	3,339

Table IV. Propensity Score Matching Estimation

This table documents descriptive statistics in the year of 2000 before the 2001 regulation change in Panel A and average treatment effects in Panel B for samples matched by logit propensity score. Treatment sample consists of 99 mutual funds with valid matching variables. Treated mutual funds are matched to at most four unique mutual funds in control sample by using a nearest neighbor logit propensity score match with a 0.005 caliper. 366 mutual funds in control sample are matched on variables listed in Panel A. All variables are defined in Table A1. Standard errors are reported in parentheses below the estimated coefficient and robust to clustering at fund level in Panel B. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Descriptive Statistics in Matched Samples (# of Treat: 99; # of Control: 366)

	Treatment		Matched Control			
Variable	Mean	Std Dev	Mean	Std Dev	Diff	*t*
Indep Inv Exp	0.23	0.27	0.22	0.23	0.01	(0.44)
Dep Inv Exp	0.90	0.16	0.87	0.29	0.03	(1.43)
Indep Chair	0.16	0.37	0.12	0.33	0.04	(0.91)
Board Size	5.63	2.25	5.83	2.06	-0.20	(-0.79)
Indep Ownership	0.05	0.04	0.05	0.03	0.00	(-0.50)
Dep Ownership	0.07	0.04	0.07	0.04	0.00	(-0.89)
Director Age	57.10	5.12	57.43	6.58	-0.33	(-0.51)
Compensation	0.01	0.02	0.02	0.02	0.00	(-0.58)
Inst Ownership	0.25	0.41	0.28	0.44	-0.03	(-0.69)
Expense Ratio	1.18	0.66	1.10	0.58	0.08	(1.12)
Fund Age	7.66	8.16	7.43	7.81	0.24	(0.25)
Fund TNA	0.32	1.18	0.51	5.12	-0.19	(-0.60)

Panel B. Average Treatment Effect for Matched Samples

Focal Control Variable	Cum Ret	Ret Gap	Port Ret	Idio Risk
Treat × After	0.055	-0.003	0.006	-0.033
(Unconditional)	(1.21)	(-0.65)	(1.35)	(-0.69)
Treat × After × Indep Inv Exp	0.350*	0.043***	-0.011	-0.135
(Conditional)	(1.68)	(2.67)	(-0.60)	(-0.54)

Table V. Investment Practice Restriction and Board Independence

This table presents the effect of the SEC amendment in 2001 on investment practice restriction, conditional on investment experience of independent directors, using the regression specifications of (1) and (2). The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002, which have information on the CRSP Mutual Fund Database. For brevity, I report difference-in-difference estimators only. All variables are defined in Table A1. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1)	(2)	(3)	(4)
Treat × After	-0.911**	0.498	0.784	1.445**
	(-2.17)	(1.04)	(1.36)	(2.06)
Treat	3.464***	1.401**	3.597***	1.476*
	(8.59)	(2.47)	(6.55)	(1.88)
After	-0.389***	-0.457	-0.412***	-0.464
	(-5.38)	(-1.35)	(-4.03)	(-1.32)
Treat × After × Indep Inv Exp			-6.674***	-4.420***
			(-4.30)	(-2.66)
Treat × Indep Inv Exp			-7.715***	-0.299
			(-5.28)	(-0.14)
After × Indep Inv Exp			-0.125	0.025
			(-0.35)	(0.06)
Indep Inv Exp		0.026	7.083***	0.045
		(0.07)	(27.99)	(0.12)
Control Variable	No	Yes	No	Yes
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.013	0.247	0.108	0.247
Num of Observations	10,104	7,845	10,104	7,845

Table VI. Contractual Management Fee and Board Independence

This table presents the effect of the SEC amendment in 2001 on the association of contractual management fee with fund performance, conditional on investment experience of independent directors, using the regression specifications of (1) and (2). The sample includes all mutual funds listed on SEC's EDGAR database on December 2000 and July 2002, which have information on the CRSP Mutual Fund Database. For brevity, I report difference-in-difference estimators only. All variables are defined in Table A1. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

	(1)	(2)	(3)	(4)
Treat × After	-0.087*	-0.102*	-0.095*	-0.138*
	(-1.88)	(-1.84)	(-1.69)	(-1.94)
Treat	0.096**	0.075	0.102*	0.101*
	(2.17)	(1.47)	(1.92)	(1.69)
After	0.024	0.036	0.028	0.051
	(1.41)	(1.44)	(1.17)	(1.45)
Treat × After × Indep Inv Exp			0.144	0.514*
			(0.69)	(1.83)
Treat × Indep Inv Exp			-0.154	-0.449*
			(-0.75)	(-1.72)
After × Indep Inv Exp			-0.018	-0.070
			(-0.27)	(-0.75)
Indep Inv Exp		0.047	-0.001	0.096
		(0.77)	(-0.02)	(0.91)
Control Variable	No	Yes	No	Yes
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.000	0.037	-0.004	0.035
Num of Observations	1,164	909	1,164	909

Table VII. Investment Experience of Existing/New/Resigned Independent Directors

This table explores the effect of board independence, conditional on investment experience of independent directors who (1) hold the position, (2) get hired, and (3) are resigned in the grace period of the 2001 amendment. I replicate the regression analysis of 2 as in Table II and Table III, adding the three types of investment experience. For brevity, I report difference-in-difference estimators only. All variables are defined in Table A1. Panel A and Panel B report the coefficient estimates from the regression models without and with control variables, respectively. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Without control variable				
	Cum Ret	Ret Gap	Port Ret	Idio Risk
Treat × After × Existing Indep Inv Exp	0.503***	0.039***	0.002	-0.158
	(2.69)	(2.66)	(0.14)	(-0.77)
Treat × After × New Indep Inv Exp	0.221	0.029	-0.035	0.331
	(0.80)	(1.37)	(-1.17)	(1.05)
Treat × After × Resigned Indep Inv Exp	0.109	0.025	0.010	-0.031
	(0.72)	(1.40)	(0.55)	(-0.21)
Existing Indep Inv Exp	0.006	0.016***	-0.011***	0.210***
	(1.12)	(10.83)	(-8.32)	(16.56)
New Indep Inv Exp	0.043***	0.012***	-0.006**	0.230***
	(2.80)	(4.00)	(-2.34)	(6.65)
Fired Indep Inv Exp	-0.009	0.013***	-0.006*	0.234***
	(-0.53)	(3.25)	(-1.94)	(5.88)
Control Variable	No	No	No	No
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.014	0.122	0.137	0.091
Num of Observations	8,590	4,249	4,249	8,590
Panel B. With control variable				
	Cum Ret	Ret Gap	Port Ret	Idio Risk
Treat × After × Existing Indep Inv Exp	0.478**	0.037**	-0.000	-0.070
	(2.29)	(2.16)	(-0.00)	(-0.30)
Treat × After × New Indep Inv Exp	0.713***	0.018	0.027	0.546
	(2.75)	(0.58)	(0.75)	(1.08)
Treat × After × Resigned Indep Inv Exp	-0.031	0.027	-0.006	-0.118
	(-0.15)	(1.41)	(-0.29)	(-0.43)
Existing Indep Inv Exp	0.001	0.006***	-0.005**	0.044**
	(0.10)	(2.93)	(-2.46)	(2.56)
New Indep Inv Exp	0.051***	0.002	0.001	0.056
	(2.73)	(0.46)	(0.32)	(1.54)
Fired Indep Inv Exp	0.005	0.003	0.003	0.091**
	(0.20)	(0.66)	(0.79)	(2.04)
Control Variable	Yes	Yes	Yes	Yes
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.022	0.131	0.145	0.123
Num of Observations	6,808	3,339	3,339	6,808

Table VIII. Investment/Finance-But-Investment/Non-Finance Industry Experience

This table explores the effectiveness of board independence, conditional on independent directors with (1) investment experience, (2) working experience in the finance industry except an investment company, and (3) working experience in non-finance industries. I replicate the regression analysis of 2 as in Table II and Table III, adding the three types of working experience. For brevity, I report difference-in-difference estimators only. All variables are defined in Table A1. Panel A and Panel B report the coefficient estimates from the regression models without and with control variables, respectively. Standard errors are reported in parentheses below the estimated coefficient and robust to heteroskedasticity and clustered at fund level. ***, **, and * indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Panel A. Without control variable				
	Cum Ret	Ret Gap	Port Ret	Idio Risk
Treat × After × Indep Inv Exp	0.268**	0.020*	0.001	-0.075
	(2.52)	(1.96)	(0.11)	(-0.67)
Treat × After × Indep Fin-But-Inv Exp	-0.126	-0.009	-0.008	0.097
	(-1.54)	(-1.12)	(-0.94)	(0.99)
Treat × After × Indep Non-Fin Exp	-0.111*	-0.005	-0.002	0.070
	(-1.70)	(-0.72)	(-0.22)	(1.23)
Indep Inv Exp	0.002	0.004***	-0.002**	0.058***
	(0.30)	(3.00)	(-1.96)	(4.10)
Indep Fin-But-Inv Exp	-0.000	0.002	-0.000	0.025**
	(-0.04)	(1.26)	(-0.01)	(2.12)
Indep Non-Fin Exp	-0.004	0.002	-0.002*	0.019**
	(-0.98)	(1.56)	(-1.80)	(2.52)
Control Variable	No	No	No	No
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.013	0.143	0.145	0.126
Num of Observations	8,590	4,249	4,249	8,590
Panel B. With control variable				
	Cum Ret	Ret Gap	Port Ret	Idio Risk
Treat × After × Indep Inv Exp	0.375**	0.021**	0.005	-0.117
	(2.44)	(2.05)	(0.35)	(-0.65)
Treat × After × Indep Fin-But-Inv Exp	-0.179*	-0.021*	0.002	-0.092
	(-1.91)	(-1.90)	(0.19)	(-0.87)
Treat × After × Indep Non-Fin Exp	-0.049	-0.010	0.006	0.061
	(-0.75)	(-1.45)	(0.83)	(0.94)
Indep Inv Exp	0.004	0.005***	-0.003*	0.060***
	(0.40)	(2.75)	(-1.71)	(3.73)
Indep Fin-But-Inv Exp	-0.004	0.001	-0.000	0.014
	(-0.56)	(0.80)	(-0.17)	(1.04)
Indep Non-Fin Exp	0.000	0.002	-0.001	0.027***
	(0.05)	(1.31)	(-1.01)	(2.77)
Control Variable	Yes	Yes	Yes	Yes
Fund Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R-Square	0.020	0.135	0.145	0.127
Num of Observations	6,808	3,339	3,339	6,808

Table A1. Variable Definition

Variable	Definition	Source
(1) *Board Information*		
Indep Dir Proportion	The proportion of independent directos on a fund board.	EDGAR: Form N-1A
Dir Inv Experience		EDGAR: Form N-1A
- Indep Inv Experience	The proportion of independent directors on a fund board who have professional investment experience in an investment company as an officer, an employee, or a general partner or private investment experience as a private investor.	EDGAR: Form N-1A
- Dep Inv Experience	The proportion of dependent directors on a fund board who have professional investment experience in an investment company as an officer, an employee, or a general partner or private investment experience as a private investor.	EDGAR: Form N-1A
Dir Non-inv Experience		EDGAR: Form N-1A
- Indep Non-inv Experience	The proportion of independent directors on a fund board who have experience in an investment company but in the finance industry	EDGAR: Form N-1A
- Dep Non-inv Experience	The proportion of independent directors on a fund board who have experience in an investment company but in the finance industry	EDGAR: Form N-1A
Dir Non-fin Experience		EDGAR: Form N-1A
- Indep Non-fin Experience	The proportion of independent directors on a fund board who have experience neither in an investment company nor in the finance industry	EDGAR: Form N-1A
- Dep Non-fin Experience	The proportion of independent directors on a fund board who have experience neither in an investment company nor in the finance industry	EDGAR: Form N-1A
Indep Chair	A dummy variable equal to a value one if a chairman is an independent director.	EDGAR: Form N-1A
Board Size (#)	The number of directors assigned to a board.	EDGAR: Form N-1A
Dir Ownership (M$)	The amount of mutual fund shares in millions of dollars invested by directors assigned to a board. I report the average of director's investment in a fund. Form N-1A lists director's investment in the following dollar ranges: none, $1-10,000, $10,001-50,000, $50,001-100,000, over $100,000. I set a director's investment in a fund as the midpoint of the listed ranges except 'none' and 'over $100,000'.	EDGAR: Form N-1A
Director Age (Yr)	Age of a director	EDGAR: Form N-1A
Compensation (M$)	Compensation in million dollars from a fund complex	EDGAR: Form N-1A

(Continued)

Table A1 – *Continued*

Variable	Definition	Source
(2) *Performance Information*		
FF5-Adj Cum Ret	Cumulative risk-adjusted fund returns with respect to the Fama-French 5-factors over four years before 2000 or after July 2002.	CRSP Mutual Fund
FF5-Adj Return Gap	I first compute the difference between quarterly cumulative FF5-adjusted fund return and the quarterly buy-and-hold FF5-adjusted return on a portfolio that invests in the most recently disclosed stock positions. Then, I take an average of the quarterly difference over four years before and after the amendment.	CRSP Mutual Fund
FF5-Adj Port Ret	Similar to the return gap, I compute the quarterly portfolio return first and average it over four years before and after the amendment.	CRSP Mutual Fund
FF5 Idio Risk	The standard deviation of the residual from a regression of monthly fund returns on the Fama-French 5-factor model. This measure is estimated over four years before 2000 or after July 2002.	CRSP Mutual Fund
(3) *Fund Information*		
Restriction (#)	The number of investment restrictions stated in Question 70.	EDGAR: Form N-SAR
- Derivative (#)	The number of investment restrictions stated in Question 70B to 70I.	EDGAR: Form N-SAR
- Leverage (#)	The number of investment restrictions stated in Question 70O, 70Q, and 70R.	EDGAR: Form N-SAR
- Illiquidity (#)	The number of investment restrictions stated in Question 70J.	EDGAR: Form N-SAR
- C-Score (#)	Constraint score proposed by Almazan *et al.* (2004)	EDGAR: Form N-SAR
Expense (%)	The percentage of expense in fund total net assets.	CRSP Mutual Fund
- 12b-1 Fee (%)	The percentage of actual 12b-1 fee in fund total net assets.	CRSP Mutual Fund
- Mgmt Fee (%)	The percentage of actual management fee in fund total net assets.	CRSP Mutual Fund
- K-Mgmt fee (%)	The percentage of contractual management fee in fund total net assets. It is reported in Question 48, 48A to 48K. Question 48 reports the management fee rate when it is a single rate fee. Otherwise, it reports management fees in each bracket, Question 48A to 48K, with certain ranges. In case, I take a range-weighted average of management fees across brackets.	EDGAR: Form N-SAR
Inst Ownership	The proportion of fund assets in institutional share classes to fund total net assets.	CRSP Mutual Fund
Fund Age (Yr)	The number of years since fund inception date.	CRSP Mutual Fund
Fund TNA (B$)	Fund total net assets in billion dollars	CRSP Mutual Fund
Dom Equity Fund	A dummy variable equal to a value one if a fund is a domestic equity fund.	CRSP Mutual Fund
Int'l Equity Fund	A dummy variable equal to a value one if a fund is an international equity fund.	CRSP Mutual Fund
Fix Income Fund	A dummy variable equal to a value one if a fund is a fixed income fund.	CRSP Mutual Fund
Mixed Fund	A dummy variable equal to a value one if a fund is mixed with equity and fixed income.	CRSP Mutual Fund
Index Fund	A dummy variable equal to a value one if a fund is an index fund.	CRSP Mutual Fund