

What Do Independent Directors Know? Evidence from Their Trading

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We compare the trading performance of independent directors and other executives. The findings reveal that independent directors earn positive substantial abnormal returns when they purchase their company stock, and that the difference from the same firm's executives is relatively small at most horizons. We also find that executives and independent directors make higher returns in firms with the weakest governance, the gap between these two widens in such firms, and that independent directors sitting on the audit committee earn higher returns than other independent directors at the same firm. Independent directors also earn significantly abnormal returns when they sell the company stock in a window before bad news and around earnings restatements. (*JEL* G3, G34, K22)

1. Introduction

After the corporate governance scandals of early 2000, policymakers around the world have responded by creating codes to improve ethical standards in business (e.g., the Sarbanes-Oxley Act in the United States, and the Cadbury Report and the Smith Report in the United Kingdom). A common theme in these guidelines is the independence of the boards of directors that oversee corporate managers. For example, in 2002, the NYSE and NASDAQ submitted proposals that required boards to have a majority of independent directors with no material relationships with the company. An independent director is defined as someone who has never worked at the company or any of its subsidiaries or

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consultants, is not related to any of the key employees, and does not/did not work for a major supplier or customer.¹

The rationale for this policy recommendation is that board members with close business relationships with the company or personal ties with high-ranking officers may not assess its performance dispassionately or may have vested interests in some business practices.

Some criticize the emphasis on independent board members, claiming that while they are independent in their scrutiny, they have much less information than insiders. If the executives want to act against the interest of the shareholders, they can simply leave outsiders in the dark. Thus, since the independent board members have very limited information, their monitoring could be extremely ineffective.²

In this paper, we take a first look at the question of whether independent directors have enough information to monitor the company's executives by analyzing their trading behavior in the company stock. We indirectly measure the level of inside information independent directors collect while serving on the board by comparing the market-adjusted returns associated with their trades to those associated with the executive officers' trades.

Using a comprehensive sample of reported executives' and directors' transactions in U.S. companies from 1986 to 2003, we find that executive officers earn higher abnormal returns than the market, when they make open market purchases, and that the independent directors do as well.

We find that the difference between the returns earned by executives and independent directors is relatively small at most of the horizons analyzed. The results are robust to the inclusion of firm fixed effects in the regression, which allows us to compare officers and independent directors of the same firm, and to control for time-invariant, firm-specific characteristics that might affect returns, as well as individuals' incentives and constraints. The results are also robust to using a variety of alternative specifications (e.g., controlling for the size of the transaction and stock holdings in the firm, the firm's size, and book-to-market, and past return volatility).

We also find that executives and independent directors earn significantly higher returns than the market, for almost all levels of the Gompers, Ishii, and Metrick (2003) Governance Index. However, in the best governed firms (Governance Index 5 and 6), the executives' excess returns are low and indistinguishable from zero, while in the worst governed firms (Governance Index 14 and higher) they earn an excess return of 21%. The independent directors earn less than the executives. The gap in excess return between executives and directors is larger in the firms with the weakest governance, while it disappears

¹ Indeed, in recent years, the percentage of independent directors in the board has increased dramatically. In 2006, Spencer Stuart collected data for boards of S&P 500 corporations and found that 81% of directors are independent. Of 190 boards (39%) today, the CEO is the only insider, compared with 127 boards (27%) in 2001.

² For example, Warren Buffett has often argued that "independent" nonexecutive directors are often kept in the dark by their executive counterparts.

for firms with the best governance. This result is consistent with the view that in better governed firms the independent directors are more informed.

We find that independent directors benefit from sitting on the audit committee and earn an additional return of 1.89% at the longest horizon. We also find that independent directors earn higher returns from open market purchases if they belong to bigger boards, possibly because more independent directors serve on such boards.

Overall, these results suggest that independent directors are informed about the firm, at least in good times. Not only is the gap between the returns on the stock purchases of independent directors and executives small at most horizons and in most situations, but also open market purchases by independent directors are pervasive across firms and frequent: we find that 79.13% of the firms filing with the SEC have directors making open market purchases of the company stock and that independent directors on average make as many open market purchases as the officers of the firm.

To study whether independent directors are also informed in bad times, we analyze their trading performance when they make open market sales. Sales are problematic because they may be driven by diversification motives or by the need to rebalance the portfolio after a grant, rather than by information. In fact, consistent with the insider trading literature, we find that both independent directors and officers do not earn higher returns than the market when they make open market sales.

To overcome this problem, we focus on the return from sales in two situations when trading is more likely to be driven by information rather than diversification motives: bad news (i.e., events in which the firm is experiencing a substantial market-adjusted drop in stock price) and earnings restatements. In both cases, we find that independent directors and executives outperform the market. These results are consistent with the hypothesis that independent directors are informed ahead of the market in critical situations.

Besides the literature on insider trading (Jaffe 1975; Seyhun 1986, 1992, 1998; Rozeff and Zaman 1988; Jeng, Metrick, and Zeckhauser 2003), our paper is related to the literature that studies the relationship between companies' financial and economic performance and the proportion of independent directors on the board (Hermalin and Weisbach 1991, 1998; Mehran 1995; Klein 1998; Bhagat and Black 2001).³

The paper is organized as follows: In the next section, we describe the data and investigate whether our sample of firms and individuals is representative of the larger universe of U.S. firms. We also explore whether the independent directors have enough money at stake to have the incentive to trade optimally and whether they trade often enough to reveal their degree of information

³ On the theoretical side, very few papers address the issue of the optimal board composition. An exception is Harris and Raviv (2008), who model the interaction between inside and independent directors and the optimal allocation of decision-making authority. Hermalin and Weisbach (2003) provide an excellent review of the literature.

consistently over time. In Section 3, we discuss our results. Section 4 contains various robustness checks. We repeat the analysis using a stricter definition of independence, to make sure that the results are not simply the effect of a misclassification. We also control for firm characteristics that might influence returns irrespective of who is trading, such as size, book-to-market, and past return volatility. In Section 5, we examine the effect of governance quality and we investigate in more detail the mechanisms through which the independent directors can acquire information, including the effect of committee membership, board size, and attendance. In Section 6, we investigate whether the independent directors have timely information when the firm performs poorly and their monitoring role is potentially more critical. We focus on trading returns from sales in advance of bad news and earnings restatements. Section 7 concludes.

2. Executives' and Independent Directors' Trades

2.1 Data description

Our main source of data is the TFN Insider Filing Data, which contains information on all corporate insider trading activity reported on SEC Forms 3, 4, and 5 from 1986 to 2003.⁴ The Securities and Exchange Act of 1934 requires all individuals that have "access to non-public, material, insider information" to report sales or acquisitions of the company's securities to the SEC. These individuals include the company's officers, directors, and beneficial owners of more than 10% of the company stock. The dataset contains the name of each filer, the various positions she holds in the firm (i.e., president, vice president, large blockholder), the date of the transaction, the number of shares bought/sold, the price paid/received, and the size of her resulting holdings in the company stock.

To investigate the different degrees of information that independent directors and executives might have about the company, we merge the data with the CRSP dataset, and examine the returns that can be earned at different horizons by mimicking the trades of the following categories of individuals: (i) executives of the firm, (ii) directors who have no past or present business or familial ties to the firm or the executives nor own large blocks of the company stock (*independent directors*), and (iii) nonexecutive directors who own more than 10% of the equity (*outside blockholders*).⁵ Although the focus of our analysis is the trading activity of the first two groups, we analyze the transactions of the outside blockholders as well. While not related to the officers, these individuals

⁴ More specifically, Form 3 contains an initial statement of beneficial ownership for all individuals required to file with the SEC. Form 4 contains changes in ownership positions, including stock purchases, sales, option grants, option exercises, and gifts. Form 5 contains the annual statement of change in beneficial ownership, and any exempt transactions not reported on Form 4.

⁵ Transactions executed by relatives, and those originating from indirect ownership, are attributed directly to the individual.

should be distinguished from other independent directors because they might have better access to information or more incentives to trade optimally, given their large stake in the company.⁶

To capture information-driven trading activity that does not follow mechanically from stock or option grants, we focus on open market sales and purchases and we control for stock holdings in the regression analysis. In addition, we are able to identify open market transactions that are fully or partially related to the exercise of an option and avoid double counting and misclassifications.⁷

Since we focus on open market purchases and sales, our results can provide information only on the subset of independent directors who trade the company stock. To determine whether such independent directors sit on boards of corporations that are representative of U.S. publicly traded firms, we provide a comparison between our sample and the universe of firms in Compustat. Based on TFN data, after excluding financial firms and utilities, 18,896 firms filed Forms 3, 4, and 5 with the SEC during our sample period and, thus, had officers and/or directors owning the company stock or being awarded stock options. Of these firms, 79.13% had at least one individual making open market purchases, corresponding to 14,953 firms. Each of these firms has both independent directors and officers buying the company stock. The same firms also had both independent directors and officers engaging in open market sales.⁸

However, more importantly, it is possible that even if a large fraction of firms have at least one independent director buying and selling stocks of the company, in the average firm the fraction of independent directors who are active buyers and sellers is still small. This issue is important because if few independent directors within each firm trade their company stock, our results should be interpreted with caution. Our sample indicates that within each firm, on average, the fraction of independent directors who trade in a given year is 51.01% (median = 50%), while the fraction of executives is 48.56% (median = 50%). We also find that 18.49% of the independent directors and 19.12% of the executives who own stocks never traded in our sample period. Our results should be interpreted in light of these numbers. The analysis we provide is based on those executives and independent directors who trade. Even in firms where directors trade their company stock, a large fraction of both independent

⁶ Also, to the extent that some large blockholders are misclassified into the independent director category, we want to make sure that the returns earned by the independent directors are not the consequence of such potential misclassification.

⁷ The acquisition of a share of company stock through the exercise of an option is not included among the purchases in our dataset, as the share has not been acquired through an open market transaction. However, if the insider decides to sell such a share, the resulting transaction will be classified as an open market sale, and included in our dataset. The sales related to the exercise of an option are 39.71%, 20.02%, and 8.38% of the sales transactions made by the executives, the independent directors, and the outside blockholders, respectively.

⁸ These results are consistent with the findings of the corporate governance literature as to the fraction of companies that compensate directors through stocks and stock options. Yermack (2004) documents that 77% of the directors in his sample receive either stock or option awards and Perry (2000) shows that the trend toward equity-based compensation for directors has been increasing over time.

directors and executives do not participate in trade. Interestingly, the fraction of nontrading independent directors and executives is very similar.

These individuals also trade quite often: the average (median) yearly number of purchases is 5.53 (2) for independent directors, 5.04 (2) for officers, and 8.4 (4) for CEOs.⁹ These statistics suggest that a large fraction of directors trade the company stock and that our results are relevant for a very large group of companies.

When we merge our sample of 14,953 companies with CRSP data and keep firms for which at least 200 daily returns are available prior to the transaction date, we are left with 527,999 transactions, involving 94,054 individuals and 10,654 firms. Of these transactions, 305,349 are made by executives, 196,211 by independent directors, and 26,439 by large outside blockholders.

We also compare the size, book-to-market, governance decile, and return volatility of our sample firms to those in Compustat over the period between 1986 and 2003. The average firm size, measured as the natural logarithm of the firm's assets, is 5.5, compared to the Compustat value of 5.03. The average book-to-market value is 0.50 in our sample, compared to 0.60 in Compustat.¹⁰ The median governance decile is 9 in both datasets.¹¹ A breakdown of the firms by Governance Index indicates that all the governance deciles are approximately equally represented in the sample, with the exception of the three deciles with the worst governance that constitute only 7%, 6%, and 4.59% of the transactions, respectively. This evidence suggests that the firms in the sample have similar characteristics to the firms in Compustat. Finally, the average firm return volatility, measured as the standard deviation of the daily market-adjusted returns over the period between 380 and 20 trading days prior to the transaction, equals 0.03 daily and 0.18 monthly.

Panel A of Table 1 displays the summary statistics for the whole sample. Consistent with the literature on insider trading, we find that both executives and independent directors are net sellers: sales represent 66% of the overall transactions made by these individuals and have a higher mean value than purchases. This difference is at least partly due to diversification motives and portfolio rebalancing after stock grants and option exercises. The average (median) value of the sale transactions is \$456,602 (\$94,200) for executives, \$800,165 (\$85,500) for independent directors, and \$2,121,411 (\$121,300) for large blockholders. The average (median) value of the purchase transactions is \$72,731 (\$8712) for executives, \$184,054 (\$13,380) for independent directors, and \$223,015 (\$12,500) for outside blockholders. Consistent with the nature of the trade data, the sample is highly skewed, with a few individuals executing very big

⁹ Officers tend to sell more than independent directors: on average, there are 19 sales per year made by CEOs, 10 by officers, and 7.6 by independent directors.

¹⁰ We also categorize the firms in our dataset in 5×5 size and book-to-market portfolios, constructed using the breakpoints in Fama and French (1992). We find that despite growth, firms are over-represented in the sample, and the firms are evenly distributed across the other categories.

¹¹ Note that the Gompers, Ishii, and Metrick (2003) Governance Index ranges from 5 to 14.

Table 1
Summary statistics: transactions and firms characteristics

Panel A: Whole sample						
Transaction characteristics						
	Percentage	Mean	Median	Std. Dev.	Average <i>n</i> of transaction	Number of transactions
Purchases						
% purchases						
Executive Officers	15.63%				5.04	82,503
Independent Directors	16.78%				5.53	88,617
Large Outside Blockholders	1.96%				13.07	10,353
Value						
Executive Officers		\$72,731	\$8,712	\$1,133,121		81,862
Independent Directors		\$184,054	\$13,380	\$10,300,000		88,050
Large Outside Blockholders		\$223,015	\$12,500	\$3,657,372		10,262
Sales						
% sales						
Executive Officers	42.21%				10.00	222,846
Independent Directors	20.38%				7.59	107,594
Large Outside Blockholders	3.05%				24.79	16,086
Value						
Executive Officers		\$456,602	\$94,200	\$5,489,410		222,372
Independent Directors		\$800,165	\$85,500	\$10,500,000		107,225
Large Outside Blockholders		\$2,121,411	\$121,300	\$29,600,000		16,067
Holdings						
# of shares						
Executive Officers		450,236	22,554	4,261,338		94,792
Independent Directors		592,377	25,375	4,638,740		52,729
Large Outside Blockholders		2,984,694	982,704	15,900,000		8,360
Value						
Executive Officers		\$12,200,000	\$360,028	\$320,000,000		94,768
Independent Directors		\$12,000,000	\$283,774	\$153,000,000		52,710
Large Outside Blockholders		\$71,000,000	\$6,407,808	\$501,000,000		8,354
Firm characteristics						
		Mean	Median	Std. Dev.		Observations
Governance Index		8.91	9.00	2.59		6,071,680
Size		5.50	5.43	2.06		17,211,242
Book-to-Market Value		0.50	0.36	0.51		16,632,865
Total Return Volatility		0.04	0.03	0.02		21,017,498
Panel B: Subsample for which we have individual participation to committees						
Individual characteristics						
	Percentage	Mean	Median	Std. Dev.		Person-Firm-Year
Audit Committee	13.30%					49,457
Compensation Committee	12.47%					49,488
Nominating Committee	7.82%					49,465
Corporate Governance Committee	3.37%					49,483
Executive Committee	6.84%					49,483
Former Employee	8.53%					15,645
Charity	0.09%					15,645
Business transaction	2.69%					15,645

(continued overleaf)

Table 1
(Continued)

	Percentage	Mean	Median	Std. Dev.	Person-Firm-Year
Relative	2.18%				15,645
Interlocking Directorship	0.92%				15,645
Other Affiliation	0.09%				15,645
Compensation for Professional Services	6.62%				15,645
Strictly Independent	41.69%				13,424
Low Attendance (less than 75% of the Meetings)	1.62%				15,645
Designated Director	1.55%				15,645
Age		57.51	58.00	9.31	15,645
Year Service Began		1990	1993	9.00	12,413
Year Service Ended		2001	2001	1.57	12,415
Tenure		10.94	8.00	8.97	12,399
Institutional Holdings (%)		58.76	62.10	22.34	7,967
Firm characteristics					
		Mean	Median	Std. Dev.	Observations
Governance Index		8.87	9.00	2.55	3,242,720
Size (in assets)		6.95	6.80	1.56	4,445,472
Book-to-Market Value		0.35	0.25	0.36	4,364,541
Total Return Volatility		0.04	0.03	0.02	4,703,901
Panel C: Subsample of firms for which we have information on board size					
Board characteristics					
	Mean	Median	Std. Dev.	Observations	
Board Size	10.55	10.00	2.63	2,739,886	
Firm characteristics					
Governance Index	9.11	9.00	2.51	2,468,840	
Size	7.38	7.25	1.46	2,611,257	
Book-to-Market Value	0.38	0.30	0.31	2,595,166	
Total Return Volatility	0.03	0.03	0.01	2,739,886	
Panel D: Subsample of firms that restated earnings					
Reasons for the restatement					
	Percentage	Mean	Median	Std. Dev.	Observations
Acquisitions and mergers	7.01%				84,080
Cost or expense	13.88%				166,509
IPR&D	6.00%				71,962
Loan-loss	0.12%				1,440
Other	5.76%				69,042
Reclassification	2.38%				28,600
Related-party transactions	1.73%				20,760
Restructuring, assets, or inventory	12.41%				148,887
Revenue recognition	41.56%				498,546
Securities related	4.73%				56,733
Tax related	0.06%				760
Unspecified	4.36%				52,320
Prompter of the restatement					
Auditor	7.15%				53,320
Company	55.07%				410,896
Company/Auditor	1.25%				9,320
Company/FASB	1.01%				7,507
Company/SEC	1.19%				8,880
External	0.02%				160
FASB	0.76%				5,680
SEC	0.34				250,429

(continued overleaf)

Table 1
(Continued)

	Firm characteristics			
	Mean	Median	Std. Dev.	Observations
Governance Index	9.75	10.00	2.62	560,000
Size (in assets)	6.35	6.33	2.05	1,175,313
Book-to-Market Value	0.44	0.31	0.46	1,137,372
Total Return Volatility	0.04	0.03	0.02	1,196,980

The data come from the TFN Insider Filing Data Files. For each insider that files information with the SEC, we have the name and the various positions she holds in the firm (i.e., president, vice president, large blockholder), the date of the transaction, the number of shares bought/sold, and the price paid/received. We restrict our sample to the trades made by the following individuals: (i) executives of the firm, (ii) directors who are neither employees of the firm, nor large blockholders (independent directors), and (iii) nonexecutive directors who are large blockholders (own more than 10% of the company stock). We exclude utilities and financial companies, which are subject to specific regulations, and also firms for which less than 200 daily returns are available in CRSP prior to the transaction date. Panel A contains summary statistics for the whole sample. The percentages, means, medians, and standard deviations are calculated over the total transactions by all independent directors, executives, and blockholders. The average number of transactions are calculated by individual, firm, and year. The Governance Index is from Gompers, Ishii, and Metrick (2003), who measure shareholder rights by counting the number of governance provisions a firm has. More governance provisions indicate more restricted shareholder rights. Following Gompers et al., we classify companies into ten groups, or deciles: those with a Governance Index less or equal than 5, equal to 6, 7, 8, 9, 10, 11, 12, 13 and greater than or equal to 14. Size is the natural logarithm of the firm's assets. Book-to-Market is constructed from Compustat as $((data199lagged*data25) + data6 - data60)/data6$. Total Return Volatility is the volatility of firm's returns on the interval between 380 and 20 trading days before the transaction date. Panel B contains sample statistics for the subset of transactions made by individuals for whom we also have information on committee membership. Panel C contains sample statistics for the subset of transactions made in firms for which we have information about the size of the board. Such data come from Fich (2005) and Fich and Shivdasani (2006). Finally, panel D contains sample statistics for the subset of firms that have restated their earnings due to accounting irregularities between January 1997 and June 2002. This information has been collected by the U.S. GAO.

transactions. Independent directors tend to make fewer and bigger transactions than firm executives, and display more balance between the number of sales and purchases they make. Also, the distribution of their transactions is slightly more skewed than that of the executives, especially for the sales. Finally, the trades made by large outside blockholders are fewer, sizably bigger, and display higher skewness and variation across individuals than those of the other two groups.

An important issue for our study is whether these individuals, and especially the independent directors, have enough money at stake for their trades to reflect the information they possess. Panel A of Table 1 shows that the holdings of the company stock are conspicuous for all three categories, and suggests that they have the incentive to trade optimally. The average (median) value of stock holdings is \$12.2 million (\$360,028) for executives, \$12 million (\$283,774) for independent directors, and \$71 million (\$6,407,808) for large outside blockholders. One might be surprised that independent directors have such large stock holdings. This is *not* a specific feature of our sample. Yermack (2004) collected information on the independent directors elected to the boards of Fortune 500 companies between 1994 and 1996. He shows that stock ownership increases with tenure and that independent directors in their fifth year have average (median) stock holdings of \$8.48 million (\$375,000). He also finds that the highest holdings for independent directors with a tenure of five

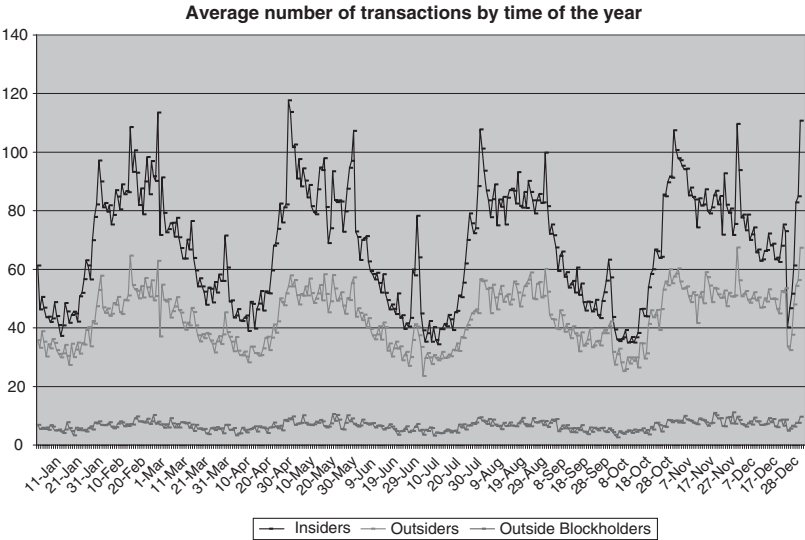


Figure 1
Average number of transactions by time of the year: (i) executives of the firm, (ii) nonexecutive directors who are not large blockholders (independent directors), and (iii) directors who are not employees of the firm, but own more than 10% of the company stock (large outside blockholders).

years reach \$3.5 billion. These values are comparable to those in our sample, where the average and median tenure for a director are eleven and eight years, respectively.

Despite this evidence, one might still be concerned that the results are driven by the presence on the board of individuals who own a big stake in the firm, but less than 10% of the equity, and thus are classified as independent directors. The analysis of the large outside blockholder category allows an indirect investigation of the effect on the returns of this potential misclassification.

The data also show high skewness and large variation within each group, especially the executives. For comparison, the stock ownership of the top five officers in the firm, obtained from ExecuComp, is similar in magnitude, although it displays less variation and less skewness. The difference could be due to the fact that our executives category includes other officers in addition to the top five executives. To ensure that the trades of a few individuals with extremely large holdings do not influence the results, we replicate the regressions dropping the trades that correspond to the top 1% of holdings in each of the three groups, and the results do not change.

Another important concern for our study is that independent directors might be informed and trade only very infrequently. Consequently, good performance relative to the market does not necessarily imply that they are able to access information consistently over time, nor that they have information at times in which it is crucial for monitoring. To quantify whether this issue is important, in Figure 1, we break down the average number of transactions by time of the year

for each group of individuals. Figure 1 shows that independent directors trade uniformly throughout the year. Possibly due to blackout periods and a fear of violating insider trading regulations, the average number of trades diminishes for both executives and independent directors around quarterly announcement dates, but more so for executives. This evidence is consistent with Bettis, Coles, and Lemmon (2000), who report that the transactions of insiders diminish in early January, April, July, and October. Also recall that, within each firm, the officers make on average 5.53 purchases per year, while the independent directors make 5.04. This result indicates that on average the independent directors purchase the company stock as frequently as the officers of their firm.

To further investigate whether individual and firm characteristics influence returns, and to potentially shed light on the mechanism through which the information flows, we combine the trades from the SEC filings with data on individual demographic characteristics, tenure, and committee membership from the IRRC dataset (1996–2003), board characteristics from Fich (2005) and Fich and Shivdasani (2006), firm characteristics from Compustat, and the Governance Index constructed by Gompers, Ishii, and Metrick (2003). Panel B of Table 1 illustrates the breakdown of individuals into committees, any links between the director and the firm that could impair her independence, and various demographic characteristics. The audit and the compensation committees are the most common, accounting for 13.30% and 12.47% of the individual-firm-year combinations, while the nominating, corporate governance, and executive committees represent a smaller fraction of the data, because they are smaller in size and also because they were established more recently and do not yet account for many observations. When we merge such information with our dataset, the number of director-company-year combinations for which we have information drops to less than half, from 49,457 to 15,645. The table contains information on the fraction of individuals that are former employees (8.53% of the observations), made business transactions with (2.69%), or provided professional services to the firm (6.62%). It also shows the extent of interlocking with other companies, boards (0.92% of the observations), poor attendance, defined as being present at less than 75% of the meetings (1.62% of the observations), being a director designated by a big investor (1.55%), age (on average 57), tenure (11 years), and institutional holdings (58.7%).

Panel C of Table 1 contains summary statistics for the firms for which information on board size is available. Such data have been collected by Fich and Shivdasani (2006) for the Fortune 1000 firms and are described in detail in their paper. When we merge such information with our dataset, we are left with 1350 firms and 16,314 individuals, corresponding to 56,481 trades and 10.70% of the whole sample. Consistent with the findings of Fich and Shivdasani (2006); Yermack (1996); and others, the average and median board size is 10, with a standard deviation of 2.625.

Finally, we merge our data with a sample collected by the U.S. General Accountability Office (GAO) on firms that restated their earnings due to

accounting irregularities between 1997 and 2002.¹² Of the 919 restatement cases collected by GAO, 309 involve firms in our dataset. Most firms experience one restatement, fourteen firms experience two, and four firms experience three. Overall, these 309 cases involve 287 firms, 5703 individuals, and 27,850 trades and account for 5.28% of the original dataset. For each restatement, we have information on the specific reasons for the restatement: whether it was prompted by the company or an external entity (i.e., the SEC/auditor/FASB) and the date it was announced. A large fraction of the firms restated their earnings due to revenue recognition, which according to Anderson and Lombardi Yohn (2002) yields the most pronounced negative market reaction. Such restatements constitute 41.56% of our sample. Cases in which the restatement was prompted by an external party, such as the SEC, FASB, or an auditor, account for 25.81% of the transactions.

To make sure that there are no biases due to the specificity of the subsample analyzed, we also reproduced the trading summary statistics (purchases and sales) reported in panel A of Table 1 for all subsamples (not reported). Since firms that have committee information are bigger and have slightly higher book-to-market values than the whole sample, directors and executives in these firms have on average higher stock holdings. The same is true for the subsample for which the size of the board is available and for the firms that restated their earnings. As expected, the latter group also has worse governance, with an average Governance Index of 11, as opposed to the 9 of the other samples. Given these differences across samples, before adding any control variables we reestimate the base regressions on each subsample to check whether any difference in the findings is simply due to the different samples, as opposed to the extra controls.

3. Empirical Results

To investigate the informativeness of the executives', the independent directors', and the large outside blockholders' trades, we analyze whether independent directors profit when trading the stock of the company they are board members of, by using regression analysis. In a previous version of this paper, we performed an event study that reached similar conclusions. The event study also showed that independent directors and executives have excellent *timing abilities* and do not just happen to be trading at times in which the stock has been doing well for a while. For example, when we analyzed the returns from trading a little earlier than they do (twenty trading days earlier), we found that their returns would have been much lower. The analysis of the individual trading also confirmed previous findings that independent directors and insiders are contrarians, who buy after price declines and sell after price increases (Lakonishok and Lee 2001; Jenter 2005).

¹² The GAO dataset is the most widely used public source of information on restatements.

For each transaction made by the independent directors, large blockholders, and insiders, we calculate the market-adjusted returns of holding the position for various horizons (0, 30, 60, 90, and 180 trading days).¹³

In our basic specification, we regress the return on a dummy variable equal to one if the trading is initiated by an independent director and a dummy variable equal to one if the trading is initiated by a large blockholder (we omit the insider's dummy as its coefficient is captured by the constant in the regression). In our specification, we include firm fixed effects for several reasons. First, it is otherwise possible that the results could be driven by a selection bias. If there are some omitted firm characteristics that drive both the choice of directors and their ability to collect information, the results could be entirely explained by the firm selection. Second, it is possible that stocks that are more intensively traded by independent directors have higher average returns, irrespective of who is trading. Finally, Bettis, Coles, and Lemmon (2000) document that a large fraction of firms restrict trading by insiders (in their sample, more than 90% of firms have such policy). If the relative fraction of independent directors and executives in the board is correlated with these governance characteristics, it is possible that our results are due to firm-level governance rules. By including a firm fixed effect, we control for any time-invariant differences across firms and we provide a comparison of executives and independent directors belonging to the same firm and facing the same institutional environment.

Panel A of Table 2 reports the results for purchases. Purchases are more information-driven and will therefore be the main focus of the analysis. In order to appropriately measure the quality of information that independent directors acquire over the course of their jobs, it is important to look at two separate measures. The level of the abnormal returns earned by independent directors is an implicit measure of how much inside information they have vis-à-vis the market. On the other hand, the difference between the trading returns of executives and independent directors measures the quantity of information acquired by them vis-à-vis the private information acquired by the executives. The assumption implicit in the second measure is that executives acquire the maximum level of inside information. The regression analysis allows us to look at both measures, but in the discussion of the results, we mainly focus on the difference between the market-adjusted returns associated with independent directors' trades and those associated with the executive officers' trades.

The constant measures the market-adjusted return of the company officers. On average, mimicking the executives' buys yields a 12.10% market-adjusted return in 180 days.¹⁴ This effect is highly statistically significant and confirms

¹³ Like most of the literature, we calculate the return from investing one dollar in the same way as the individual does, by either purchasing one dollar worth of the company stock when she buys, or by selling one dollar worth of the company stock when she sells. Market-adjusted buy-and-hold returns (BHARs) are calculated by subtracting the market return from the firm return, $(R_{it} - R_{mt})$, compounding it over time and then averaging within each trader category.

¹⁴ Rule 16(b) of the Securities and Exchange Act of 1934 requires insiders to surrender any profit made on transactions that are offset within six months. This rule makes the 180 trading day horizon particularly interesting.

Table 2
Executive officers and independent directors trades: market-adjusted returns

	Panel A: Purchases									
	Market-adjusted return of holding the individual position									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	RET(t)	RET(t + 30)	RET(t + 60)	RET(t + 90)	RET(t + 180)	RET(t)	RET(t + 30)	RET(t + 60)	RET(t + 90)	RET(t + 180)
Constant	0.30*** (0.02)	4.22*** (0.11)	6.52*** (0.16)	7.92*** (0.23)	12.10*** (0.38)	0.26*** (0.04)	5.10*** (0.17)	7.97*** (0.25)	9.54*** (0.37)	15.34*** (0.51)
Independent Director	0.00	-0.50*** (0.17)	-0.96*** (0.26)	-1.01*** (0.37)	-2.12*** (0.56)	0.14** (0.06)	-0.46 (0.29)	-1.08*** (0.40)	-1.52*** (0.59)	-2.50*** (0.80)
Large Outside Blockholder	-0.14 (0.10)	-1.23** (0.56)	-1.30 (0.84)	-0.50 (1.18)	-0.29 (2.23)	-0.32* (0.19)	-1.89** (0.86)	-2.51* (1.29)	-2.83 (1.88)	-3.88 (2.59)
Transaction						0.50 (0.99)	4.73 (4.85)	8.30 (10.65)	0.58 (14.03)	-28.82** (14.22)
Holdings						0.00	-0.15*** (0.04)	-0.21*** (0.07)	-0.20*** (0.12)	-0.33*** (0.12)
Holdings × Independent Director						-0.01	0.12*** (0.01)	0.14* (0.08)	0.14* (0.08)	0.27** (0.13)
Holdings × Large Outside Blockholder						0.08*** (0.03)	0.14 (0.12)	0.08 (0.20)	-0.14 (0.24)	-0.50 (0.31)
Transaction × Independent Director						-1.40 (1.02)	-8.48 (5.19)	-15.85 (11.34)	-15.19 (14.74)	10.00 (14.85)
Transaction × Large Outside Blockholder						2.17 (1.81)	9.17 (7.10)	4.15 (12.82)	6.42 (15.26)	22.57 (18.56)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	181,473	181,459	180,789	179,921	176,065	55,009	55,007	54,853	54,707	54,059
R-squared	0.10	0.20	0.22	0.26	0.30	0.16	0.22	0.24	0.29	0.34

Panel B: Sales

Constant	-0.52*** (0.01)	-0.18*** (0.07)	0.22** (0.1)	0.72*** (0.13)	1.60*** (0.2)	-0.72*** (0.03)	-0.14 (0.10)	-0.20** (0.14)	-0.35* (0.18)	-1.12*** (0.30)
Independent Director	0.10*** (0.02)	-0.31** (0.14)	-0.62*** (0.21)	-1.12*** (0.28)	-2.51*** (0.44)	0.15*** (0.06)	-0.19 (0.25)	-0.33 (0.33)	-0.38 (0.43)	-1.45*** (0.64)
Large Outside Blockholder	0.23*** (0.06)	-0.51 (0.41)	-1.04* (0.56)	-0.46 (0.79)	-2.88** (1.18)	0.20** (0.10)	-1.00* (0.58)	-2.07*** (0.80)	-1.83 (1.21)	-2.19 (1.66)
Transaction						-2.25* (1.22)	-0.27 (2.63)	4.86 (4.58)	3.49 (5.31)	6.99 (15.81)
Holdings						-0.00 (0.00)	-0.01 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.01 (0.01)
Holdings × Independent Director						0.00* (0.00)	0.03*** (0.01)	0.03** (0.01)	0.02 (0.01)	0.04 (0.03)
Holdings × Large Outside Blockholder						0.00*** (0.00)	0.01*** (0.01)	0.01*** (0.01)	0.01* (0.01)	0.02 (0.01)
Transaction × Independent Director						0.00 (0.00)	-1.04 (2.90)	-2.91 (4.87)	-4.81 (5.60)	-3.54 (15.90)
Transaction × Large Outside Blockholder						1.69 (1.40)	1.31 (5.38)	-2.55 (7.18)	1.03 (6.80)	-5.50 (16.13)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	346,526	346,469	344,663	342,845	336,759	80,598	80,597	80,539	80,456	79,827
R-squared	0.18	0.15	0.17	0.19	0.22	0.30	0.18	0.20	0.24	0.29

(continued overleaf)

Table 2
(Continued)

	Panel C: Purchases									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	RET(t)	RET(t + 30)	RET(t + 60)	RET(t + 90)	RET(t + 180)	RET(t)	RET(t + 30)	RET(t + 60)	RET(t + 90)	RET(t + 180)
Constant	0.33*** (0.03)	4.69*** (0.15)	7.26*** (0.28)	8.94*** (0.44)	13.61*** (0.61)	0.29*** (0.05)	5.32*** (0.20)	8.45*** (0.31)	10.09*** (0.47)	16.29*** (0.83)
Independent Director	-0.10*** (0.03)	-1.41*** (0.19)	-2.28*** (0.35)	-2.69*** (0.53)	-4.78*** (0.77)	-0.00 (0.06)	-1.10*** (0.29)	-2.30*** (0.43)	-2.89*** (0.64)	-5.01*** (1.11)
Large Outside Blockholder	0.20** (0.10)	-1.68*** (0.60)	-2.98*** (1.04)	-4.00*** (1.45)	-3.91 (2.77)	0.20 (0.17)	-1.00 (0.80)	-2.00 (1.38)	-3.29* (1.83)	-2.75 (5.15)
Transaction						1.71** (0.78)	7.60 (5.15)	9.26 (10.88)	7.13 (14.02)	-10.46 (7.65)
Holdings						-0.01 (0.01)	-0.17*** (0.04)	-0.20*** (0.06)	-0.25*** (0.08)	-0.38*** (0.12)
Holdings × Independent Director						0.00	0.12***	0.14**	0.17*	0.26*
Holdings × Large Outside Blockholder						(0.01)	(0.05)	(0.07)	(0.09)	(0.14)
Transaction × Independent Director						0.01	0.01	-0.09	-0.15	-0.63**
Transaction × Large Outside Blockholder						(0.02)	(0.09)	(0.11)	(0.16)	(0.26)
Firm fixed effects						-1.79**	-6.63	-10.14	-8.90	6.18
Observations						(0.83)	(5.35)	(11.12)	(14.14)	(7.92)
R-squared						1.38	3.51	2.32	1.74	3.62
						(1.56)	(8.31)	(13.58)	(15.99)	(12.20)
	No	No	No	No	No	No	No	No	No	No
	181,473	181,459	180,789	179,921	176,065	55,009	55,007	54,853	54,707	54,059
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Panel D: Sales

Constant	-0.53*** (0.01)	-0.17** (0.09)	0.18 (0.14)	0.58*** (0.19)	1.26*** (0.29)	-0.69*** (0.02)	-0.03 (0.11)	-0.09 (0.18)	-0.14 (0.26)	-0.95** (0.45)
Independent Director	0.11*** (0.02)	-0.23 (0.16)	-0.37 (0.25)	-0.43 (0.34)	-1.28** (0.58)	0.07 (0.06)	-0.35 (0.28)	-0.69 (0.44)	-0.73 (0.59)	-1.43 (1.04)
Large Outside Blockholder	0.23*** (0.06)	-1.21*** (0.43)	-2.00*** (0.72)	-1.89* (1.01)	-3.82** (1.71)	0.28*** (0.09)	-1.81*** (0.61)	-3.10*** (1.13)	-3.24* (1.76)	-4.75 (3.25)
Transaction						-4.09*** (1.15)	-1.77 (1.66)	-1.30 (2.03)	-1.85 (3.10)	1.76 (5.85)
Holdings						-0.00 (0.00)	-0.01 (0.01)	-0.00 (0.00)	-0.00 (0.00)	0.01 (0.01)
Holdings × Independent Director						0.00** (0.00)	0.02*** (0.01)	0.03** (0.01)	0.02 (0.00)	0.02 (0.01)
Holdings × Large Outside Blockholder						0.00*** (0.00)	0.02** (0.01)	0.01** (0.01)	0.01 (0.01)	-0.01 (0.02)
Transaction × Independent Director						0.00 (0.00)	2.82** (1.51)	0.49 (0.00)	-1.25 (0.01)	0.96 (0.02)
Transaction × Large Outside Blockholder						1.41 (1.30)	1.87 (4.33)	4.18 (4.06)	7.94* (4.20)	9.23 (7.75)
Firm fixed effects	No	No	No	No	No	No	No	No	No	No
Observations	346,526	346,469	344,663	342,845	336,759	80,598	80,597	80,539	80,456	79,827
R-squared	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer or other insider, and owns more than 10% of the company stock. Transaction measures the size of the transaction as a fraction of market capitalization (measured in \$00,000), while holding is the dollar value of the individual's holdings, scaled by \$10 million. Transaction * Independent Director is an interaction term between the size of the transaction and the independent director indicator variable; similarly, Transaction * Large Outside Blockholder is an interaction term between the transaction size and the large outside blockholder dummy. In panels A and C, the regressions include only purchase transactions, while in panels B and D the regressions include only sale transactions. The regressions in panels A and B include firm fixed effects, while panels C and D do not. The standard errors are corrected for the nonindependence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

that executives earn higher returns than the market, even after accounting for firm fixed effects. Mimicking the buys of the independent directors yields a market-adjusted return of 2.12% less than the executives over the same horizon.

To quantify the economic significance of the trading profits of the independent directors, we compare them to the compensation that a typical independent director earns. We calculate such compensation as the sum of the average annual retainer from Yermack (2004) and additional compensation (meeting fees, committee fees, and other fringe benefits) calculated by Perry (2000). The average total annual gain from purchases corresponds to 58% of the total compensation that directors receive. This estimate is consistent with the estimate provided by Yermack (2004).¹⁵

On average, independent directors make larger transactions than the executives. If bigger transactions generate an incentive to trade better, then the difference in mean returns between these two groups could be biased downward. To account for this possibility, we control for transaction size, stock holdings, and the interaction between these variables and the identity of the individual trader (the last five columns of panel A in Table 2). The results do not change. Mimicking the executives' trades generates a statistically significant 15.34% market-adjusted return, while the difference between executives and independent directors is unchanged and equal to 2.5%. In general, the size of the transaction does not affect returns, except at the longer horizon where, all else equal, an increase of \$10,000 in the size of the transaction leads to a 2.88% drop in the return. To interpret this magnitude, notice that the mean transaction size is \$72,731, while the median one is \$8712. On the contrary, the size of the stock holdings significantly reduces returns at all horizons, although this effect is not economically sizeable. An increase of \$10 million in stock holdings is associated with a decrease in returns of only 0.33%. Recall that the average stock holdings are \$12.2 million, while the median holdings are \$360,028. Interestingly, we find that independent directors who have larger holdings in the firm do slightly better than independent directors with smaller holdings (0.27% more at the longer horizon). This result is consistent with the theory that executives get information due to their role in the firm, while independent directors need to exert effort to get information. The higher the incentives to find out information, the more the independent director will try to acquire it.

Finally, the coefficient of large outside blockholders indicates that the high returns of independent directors are not due to large stock holdings and are not biased upward by potential misclassification of large blockholders into the independent director category. The difference between executives and large outside blockholders is bigger than the one between executives and independent

¹⁵ We obtain slightly higher values if instead of using the average annual retainer calculated by Yermack (2004), we use Spencer and Stuart S&P 500 company data, which do not take into account stock and stock option compensation.

directors at most horizons, although it is not statistically significant, which is possibly due to the few observations available for this group.

As a further check, we also repeat the regressions both after trimming the sample of the trades in the top 1% for transaction size and the stock holdings in each trader category, and after winsorizing such variables (not reported). We find that the results are not affected by these changes. An alternative strategy to eliminating the top percentile is to run regressions for each decile; these results (not reported) confirm our previous findings as well.¹⁶

In panel B of Table 2, we run the same regressions for sale transactions. Consistent with the findings of the insider trading literature, executives do not earn higher abnormal returns on sales. The difference between executives, and independent directors' returns is of the same magnitude and statistical significance as for purchases.

While the introduction of firm fixed effects in the regression addresses several problems mentioned before, it could in principle inflate the average returns of contrarian investors, who tend to buy after big price declines and sell after price run-ups (Lakonishok and Lee 2001; Jenter 2005). In the regressions with fixed effects, for each firm the coefficient of the insider dummy represents the officers' average return above (or below) the average firm return. (The coefficient reported in the table represents the average of this quantity across all firms.) If independent directors trade after price declines and before price run-ups and their returns are compared to the average for the firm over the entire time span, it is possible that the difference is positive, but the level is not.¹⁷ For this reason, we re-ran the regressions presented in panels A and B of Table 2, removing the firm fixed effects (Table 2, panels C and D). The results show that the officers' returns in the OLS regressions without fixed effects are similar to those in the regressions with firm fixed effects. The average 180 trading day return on purchases is 16.29% versus 15.34% in the regressions with fixed effects (Table 2, panel A). This finding indicates that the effect of contrarian trading does not inflate the level of insiders' returns. On the contrary, the wedge between independent directors, and officers' returns is now wider: 5.01% versus 2.5% in the fixed-effect regression. This could be due to a composition effect; the independent directors as a group tend to trade more frequently in firms that have lower returns. This latter result highlights the importance of using firm fixed effects and comparing independent directors and officers within the same firm.

¹⁶ Once we control for firm fixed effects, stock holdings, the identity of the trader, and the interactions of the last two terms, independent directors enjoy positive and significant market-adjusted returns across all transaction sizes, with the exception of the smallest decile, where the average market-adjusted return for the officers is only 4.47%. As far as the difference between independent directors, and officers' returns is concerned, the results vary across deciles. Sometimes the directors' returns are economically and statistically indistinguishable from those of the officers and sometimes significantly lower. However, we find no relationship between transaction size and the difference in returns.

¹⁷ For example, if the insiders earn -5%, but the average return for the firm over the period 1986-2003 is -15%, the dummy will be equal to 10%, offering a distorted measure of the absolute level of the return.

4. Robustness Checks

A natural question that arises when looking at our findings is whether the individuals categorized by the governance rules as independent are indeed truly independent. To investigate this issue, we exploit a stricter definition of independence proposed in the Higgs report for the U.K., which identifies as strictly independent those directors who are not employees of the firm, former employees, or employees of an organization to which the firm gives charitable contributions. In addition, the director cannot have any business relationship with the company, provide any professional service to the company, or be a relative of any officer. Finally, a strictly independent director does not have any interlocking directorships with any one of the executives or any other affiliation with the company.¹⁸ The information to implement such definition comes from the IRRC dataset and is available only for a subset of the transactions, and only for the period between 1996 and 2003. In this subsample, there are 4,190,880 observations, corresponding to 22.28% of the whole sample. The data cover 1739 firms, 22,336 individuals, and 117,626 trades. Of the 891,600 observations regarding the independent directors, 629,680 (70.62%) satisfy the definition of strict independence. This number increases slightly over the period. Compared to the other independent directors, on average the strictly independent directors make smaller transactions, own less of the company stock, have a much shorter tenure (10 versus 15 years), and are more likely to sit on the audit and compensation committees (a 45.22% probability versus a 23.47%, and a 43.68% probability versus a 19.81%, respectively). Also, the firms in which these individuals trade are larger and have a higher market-to-book ratio than those in the whole sample.

Table 3 shows that using this definition of independence does not substantially change our results. The average market-adjusted return associated with the officers' purchases is 12.42%, significant at the 1% level. The trading performance associated with the strictly independent directors is statistically indistinguishable from that of the firm's executives. In purchase transactions, both executives and strictly independent directors outperform the market; while in sales transactions, they both earn negative abnormal returns (not reported). Although these differences are not statistically significant, the magnitude of the coefficients indicates that the strictly independent directors underperform the executives by 4.44% when they buy the company stock, while the other outside directors do better than the executives. In the next section, we show that this difference is not always big and negative, but rather depends on the committees the director sits on. This evidence suggests that independent directors have less information than the executives, but in some cases, depending on which

¹⁸ According to the Sarbanes-Oxley Act, a director is independent if she is "not receiving, other than for service on the board, any consulting, advisory, or other compensatory fee from the issuer, and [is not] an affiliated person of the issuer, or any subsidiary thereof." The Higgs Report considers independent the narrower group of directors who have "no material business relationship" with the company. Note that this definition of independent director has also been used by Shivdasani and Yermack (1999).

Table 3
Executive officers and independent directors trades: strictly independent directors

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	-0.11*** (0.04)	3.67*** (0.19)	7.27*** (0.31)	7.35*** (0.36)	12.42*** (0.61)
Independent Director	0.23 (0.19)	0.14 (0.71)	-0.21 (1.36)	-0.66 (1.67)	1.45 (3.03)
Large Outside Blockholder	0.54** (0.26)	-0.65 (1.24)	0.58 (2.37)	3.15 (3.44)	2.07 (4.66)
Strictly Independent	-0.19 (0.18)	-0.10 (0.75)	-1.38 (1.35)	-1.48 (1.70)	-4.44 (3.05)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	21,791	21,791	21,770	21,737	21,495
R-squared	0.12	0.25	0.31	0.37	0.39

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. Strictly independent director is a dummy equal to 1 if the director is classified as strictly independent according to the criteria of the Higgs Report. The Higgs Report defines as independent those directors who are not employees, former employees, nor employees of an organization to which the firm gives charity contributions, do not provide any professional service to the company, are not a relative of any officer, do not have interlocking directorship with one of the executives, or any other affiliation with the company. All the regressions include firm fixed effects. The standard errors are corrected for the nonindependence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

committee they sit on, they do have the means to get information about the firm.

Another angle from which to look at the issue of whether these individuals are truly independent is to analyze their holdings of the company stock. One might wonder whether the reason for the good performance of this group is that some independent directors have very high stock holdings (see Section IIA and Yermack 2004). Focusing our analysis on independent directors with progressively lower levels of stock holdings, we find that this is not the case. In particular, we replicate the base regressions reported in Table 2 sequentially dropping observations of independent directors' trades in the highest 5th percentile of holdings values until we reach the bottom 5% (not reported). We find that, when we control for transaction size, stock holdings, and their interactions with the trader's identity, the market-adjusted returns of the executives are very stable across the subsamples, ranging between 15% and 16%, and are statistically significant at the 1% level. The difference between executives, and independent directors' returns is less than 3% in the samples where we discard independent directors down to the 35th percentile of the holdings distribution (corresponding to \$102,900). It is between 3.4% and 3.9%, when we further discard independent directors down to the 15th percentile (\$23,260), and it

Table 4
Executive officers and independent directors trades: controlling for market-to-book and size

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	1.36*** (0.20)	7.28*** (0.95)	12.90*** (1.53)	19.58*** (2.12)	45.74*** (4.06)
Independent Director	0.00 (0.04)	-0.59*** (0.19)	-1.15*** (0.29)	-1.44*** (0.43)	-2.54*** (0.63)
Large Outside Blockholder	-0.19* (0.11)	-1.25** (0.61)	-1.52* (0.92)	-1.99 (1.29)	-3.34 (2.19)
Size	-0.27*** (0.04)	-1.19*** (0.19)	-2.36*** (0.30)	-3.93*** (0.42)	-9.60*** (0.76)
Book-to-Market	0.41*** (0.06)	4.49*** (0.27)	8.59*** (0.44)	12.55*** (0.60)	22.60*** (1.46)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	133,036	133,029	132,774	132,554	131,354
R-squared	0.10	0.20	0.23	0.28	0.31

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. Size is the natural logarithm of the firm's assets. Book-to-Market is calculated as the sum of the market value of common equity and total assets minus the book value of equity over the book value of equity. The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the nonindependence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

increases to 6.89% and 8.52% in the bottom 10th (\$13,716) and 5th percentile (\$6,135), respectively.¹⁹ The results for sales transactions also confirm our earlier findings.

In Table 4, we re-ran the regressions reported in panel A of Table 2, controlling for firm size and book-to-market. Both the executives and the independent directors trade more in smaller, high book-to-market firms, which have historically performed well. The more recent insider trading literature has argued that the abnormal returns obtained by imitating these individuals might not be robust to controlling for trading strategies that exploit the size and book-to-market risk factors. Our results are robust to such controls. Consistent with the findings of Eckbo and Smith (1998); Lakonishok and Lee (2001); and Jenter (2005), accounting for size and book-to-market decreases the average returns earned by mimicking the company's executives. However, such returns are still positive and highly statistically significant. The coefficients indicate that in firms with the average size and book-to-market ratio, the executives' average

¹⁹ The results are even stronger when we do not control for transaction size, stock holdings, and their interactions. The difference between executives and independent directors is between 1.82% and 2.01%, and statistically significant at the 1% level. This is true even when we restrict our analysis to independent directors in the bottom 5% of the holdings distribution.

(median) return from purchase transactions is 8.72% (5.12%) more than the market, significant at the 1% level, and most important, the difference between independent directors and executives does not change after controlling for firm size and book-to-market ratio.

One other concern is that these individuals make higher returns than the market because they trade in riskier companies, and such riskiness varies over time and is not captured by the firm fixed effects. The previous analysis partly accounts for risk by looking at cumulative abnormal returns and by controlling for the size and book-to-market risk factors. In Table 5, we further examine this issue and run the regressions on subsamples generated based on the quartiles of total firm return volatility, measured on the interval between 380 and 20 trading days before the transaction. This variable captures both systematic and idiosyncratic risk. The results should be interpreted keeping in mind that, if these individuals have superior information about the company, what appears to be volatility and risk for an uninformed investor is not necessarily so for the insider. Table 5 reports the results for purchases and shows that the return of the executives increases with the volatility of stock returns. The difference between the executives and independent directors increases with risk across the subsamples, although not monotonically. It is the lowest in the third volatility quartile, where it is equal to 0.33% and is not statistically significant, and the highest in the fourth quartile, where it is equal to 4.91% and significant at the 1% level. Overall, the independent directors do not underperform the executives in most of their trades, except for companies that have experienced a high amount of volatility in the previous year (fourth quartile). For such firms, the returns enjoyed by mimicking the executives' trades are quite high, 31.78% on average, and statistically significant. The returns of independent directors trading in the same type of firms are significantly lower, although still substantial at 26.87% on average. The returns from sales (not reported) are not economically different from zero for all the quartiles.

5. The Effect of Governance and Institutional Settings

In this section, we investigate in more detail the mechanisms through which the independent directors can acquire information. We start by examining the effect of governance quality on trading performance and on the differences between executives and independent directors. Next, we analyze the effect of various internal governance mechanisms, such as the committees they sit on and other features of the corporate boards that have been shown by previous studies to matter for monitoring effectiveness, such as board size and directors' attendance.

5.1 Are independent directors better informed in better governed firms?

To characterize the governance of the company, we use the Governance Index of Gompers, Ishii, and Metrick (2003), which measures shareholder rights by

Table 5
Executive officers and independent directors trades: accounting for return volatility

	Purchases				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Total return volatility: first quartile					
Constant	−0.03 (0.02)	0.82*** (0.10)	0.99*** (0.15)	0.86*** (0.19)	0.95*** (0.29)
Independent Director	−0.02 (0.03)	−0.29** (0.14)	−0.43** (0.21)	−0.20 (0.26)	−0.74* (0.39)
Large Outside Blockholder	0.03 (0.13)	0.16 (0.67)	0.66 (0.87)	−0.50 (1.17)	0.25 (2.15)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	45,084	45,080	44,917	44,696	43,731
R-squared	0.14	0.23	0.27	0.30	0.37
Total return volatility: second quartile					
Constant	−0.04 (0.03)	2.75*** (0.13)	4.05*** (0.18)	4.50*** (0.24)	6.01*** (0.38)
Independent Director	0.06 (0.05)	−1.00*** (0.20)	−1.57*** (0.29)	−1.69*** (0.40)	−2.73*** (0.61)
Large Outside Blockholder	0.19 (0.15)	−0.18 (0.69)	0.61 (0.95)	−0.96 (1.29)	−3.68* (1.99)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	45,085	45,081	44,908	44,695	43,730
R-squared	0.20	0.31	0.39	0.42	0.47
Total return volatility: third quartile					
Constant	0.12*** (0.04)	3.74*** (0.18)	6.31*** (0.27)	7.00*** (0.35)	9.55*** (0.54)
Independent Director	0.19*** (0.07)	0.30 (0.29)	−0.18 (0.49)	0.02 (0.60)	−0.33 (0.90)
Large Outside Blockholder	0.10 (0.17)	0.12 (0.78)	−0.37 (1.14)	0.58 (1.43)	0.16 (2.24)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	45,080	45,080	44,912	44,695	43,733
R-squared	0.17	0.31	0.38	0.43	0.47
Total return volatility: fourth quartile					
Constant	1.09*** (0.07)	9.38*** (0.31)	14.45*** (0.46)	19.00*** (0.70)	31.78*** (1.10)
Independent Director	−0.14 (0.11)	−0.78 (0.53)	−1.44* (0.78)	−1.85 (1.19)	−4.91*** (1.81)
Large Outside Blockholder	−0.48** (0.22)	−4.01*** (1.19)	−4.73*** (1.72)	−3.62 (2.41)	−5.17 (3.88)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	46,224	46,218	46,052	45,835	44,871
R-squared	0.15	0.28	0.30	0.33	0.41

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. The observations are separated into quartiles of total return volatility, measured by the variance of returns over the interval (−380, −20) trading days before the transaction, adjusted for the time span over which the return is calculated (0, 30, 60, 90, and 180 trading days). The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the nonindependence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

counting the number of governance provisions for each firm. More governance provisions indicate more restricted shareholder rights. Gompers et al. provide empirical evidence that cross-sectionally, firm value is higher when shareholder rights are stronger (i.e., when the G Index is lower). Following their approach, we classify companies into ten groups, or deciles: those with a Governance Index less than or equal to 5, equal to 6, 7, 8, 9, 10, 11, 12, 13, and greater than or equal to 14.

In Table 6, we run the base regressions controlling for governance decile and find that both executives and independent directors earn significantly higher returns than the market, for almost all levels of the Governance Index. At the mean Governance Index (equal to 9), the executives' market-adjusted return is 17.55%, significant at the 1% level, while in most of the other deciles it is slightly above 11%. Exceptions are the best governed firms (governance indices 5 and 6), where the executives' returns are low and indistinguishable from zero, and the worst governed firms (Governance Index 14), where they are very high. This result is striking because on average firms with worse governance generate lower returns for their investors than otherwise similar firms (Gompers, Ishii, and Metrick 2003). Robustness checks (not reported) that either trim or winsorize outliers confirm this finding. One possible interpretation is that in better governed firms both executives and independent directors may feel more restrained from trading on private information or that these firms hire outside directors and executives that are less likely to trade on inside information. As a consequence, they would make less money compared to the market (Giannetti and Simonov 2006).²⁰ Alternatively, our results are also consistent with the hypothesis that firms with better governance might have better mechanisms in place that allow the market to receive information: the gap between insiders' information and the market information is smaller.

If better governed firms are more transparent and have better developed mechanisms to transmit information to the board, we would expect that, all else being equal, the wedge between independent directors and executives' returns is smaller in better governed firms. The results reported in Table 6 support this view. The average difference between independent directors' and executives' returns varies across governance deciles. It is equal to 0 for the best governed firms. It is around 2–2.5% for the higher levels of the Governance Index, although not statistically significant, and it becomes bigger in economic terms (6.85% and 6.10%, respectively) and statistically significant at the 1% level in the case of G Indices equal to 12 and higher or equal to 14. The findings are stronger when we focus on strictly independent directors, who supposedly rely more on board meetings and formal communication channels to get information about the firm. Our results are robust to using an alternative measure of corporate governance developed by Bebchuck, Cohen, and Ferrell (2004).

²⁰ Somewhat contrary to this prior, our results indicate that independent directors in better governed firms trade on average more frequently than independent directors in worse governed firms. However, with these statistics, we are not able to rule out whether they trade more often, but at times in which they have less information.

Table 6
Executive officers and independent directors trades by governance: market-adjusted returns

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	0.26 (0.21)	1.83 (1.22)	3.22 (2.07)	3.51 (2.28)	0.96 (3.68)
Governance = 6	-0.33 (0.26)	-0.10 (1.40)	-2.06 (2.50)	-0.11 (2.80)	5.23 (4.99)
Governance = 7	-0.64*** (0.24)	-0.17 (1.38)	-1.46 (2.31)	2.72 (2.61)	11.74** (4.72)
Governance = 8	-0.45* (0.26)	1.22 (1.41)	2.61 (2.37)	3.18 (2.72)	11.24** (4.43)
Governance = 9	-0.21 (0.27)	1.69 (1.54)	5.74** (2.53)	6.89** (2.92)	17.55*** (4.77)
Governance = 10	-0.52* (0.28)	-0.38 (1.54)	2.05 (2.58)	1.68 (2.98)	11.70** (5.03)
Governance = 11	-0.29 (0.28)	2.78* (1.54)	5.70** (2.59)	6.63** (2.99)	11.66** (4.89)
Governance = 12	-0.20 (0.29)	4.93*** (1.66)	7.95*** (2.67)	7.93** (3.14)	13.96*** (5.18)
Governance = 13	-0.42 (0.31)	2.41 (1.80)	5.68** (2.86)	2.20 (3.29)	8.78 (5.39)
Governance ≥ 14	-0.17 (0.33)	6.61*** (1.80)	10.34*** (2.85)	8.07** (3.35)	21.31*** (5.38)
Governance ≤ 5 * Indep. Dir	-0.15 (0.16)	-2.39* (1.34)	-4.57*** (1.68)	-3.95** (1.90)	0.05 (3.20)
Governance = 6 * Indep. Dir	-0.20 (0.21)	-0.68 (1.23)	-1.37 (1.67)	0.16 (2.12)	-2.49 (4.32)
Governance = 7 * Indep. Dir	0.25* (0.15)	-1.33 (0.85)	-1.50 (1.16)	-2.75* (1.62)	-3.64 (3.26)
Governance = 8 * Indep. Dir	0.26 (0.19)	1.22 (0.81)	0.94 (1.18)	0.96 (1.51)	-2.45 (2.69)
Governance = 9 * Indep. Dir	0.11 (0.14)	0.20 (0.71)	-3.22*** (0.98)	-3.13** (1.31)	-3.31 (2.13)
Governance = 10 * Indep. Dir	0.16 (0.14)	0.39 (0.76)	-1.57 (1.41)	0.01 (1.64)	-2.27 (2.67)
Governance = 11 * Indep. Dir	0.03 (0.11)	-0.24 (0.55)	-1.78** (0.90)	-3.62*** (1.06)	-2.15 (1.70)
Governance = 12 * Indep. Dir	-0.16 (0.14)	-2.35*** (0.79)	-3.41*** (1.17)	-4.92*** (1.46)	-6.85*** (2.65)
Governance = 13 * Indep. Dir	0.17 (0.14)	0.46 (0.97)	-0.44 (1.42)	0.55 (1.59)	1.79 (2.31)
Governance ≥ 14 * Indep. Dir	-0.06 (0.15)	-2.64*** (0.70)	-2.95*** (1.01)	-3.32** (1.34)	-6.10*** (2.18)
Governance ≤ 5 *Large Outside Blockholder	0.24 (0.48)	-2.83 (2.94)	-3.09 (3.43)	6.04 (8.41)	3.71 (11.23)
Governance = 6 *Large Outside Blockholder	0.19 (0.73)	-9.41*** (2.53)	-8.04* (4.62)	-10.15 (7.47)	-10.45 (10.65)
Governance = 7 *Large Outside Blockholder	-0.01 (0.52)	5.19** (2.05)	7.47*** (2.41)	12.98*** (4.04)	8.74 (7.68)
Governance = 8 *Large Outside Blockholder	-0.21 (0.39)	3.09 (4.29)	14.79** (5.93)	20.40* (11.15)	28.54 (19.47)
Governance = 9 *Large Outside Blockholder	-0.43 (0.51)	-6.84** (3.07)	-11.87** (5.80)	-10.65** (5.11)	-17.13** (8.49)
Governance = 10 *Large Outside Blockholder	1.57* (0.84)	7.72** (3.45)	1.32 (5.84)	3.48 (6.55)	-0.19 (5.82)
Governance = 11 *Large Outside Blockholder	0.77** (0.33)	-0.01 (3.97)	0.10 (9.03)	-8.63 (6.67)	-4.04 (13.04)
Governance = 12 *Large Outside Blockholder	1.97*** (0.72)	-0.29 (2.78)	-21.05*** (7.00)	-23.27*** (5.50)	-9.06 (6.03)

(continued overleaf)

Table 6
(Continued)

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Governance = 13 * Large Outside Blockholder	-0.80** (0.39)	6.96** (3.46)	4.79 (3.60)	1.46 (4.08)	13.75 (9.74)
Governance ≥ 14 * Large Outside Blockholder	0.01 (0.39)	-1.57 (3.98)	0.28 (3.57)	-2.65 (5.20)	2.64 (4.59)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	37,263	37,263	37,203	37,119	36,566
R-squared	0.12	0.21	0.27	0.27	0.35

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. The Governance Index is a measure constructed by Gompers, Ishii, and Metrick (2003) by counting the number of governance provisions a firm has. More governance provisions (higher Governance Index) indicate worst governance. Following Gompers et al., we classify companies with a Governance Index ≤ 5, equal to 6, 7, 8, 9, 10, 11, 12, 13, ≥ 14. Governance = 1 * Indep. Dir is an interaction term between the dummy variable for the first decile of the Governance Index and the Independent Director dummy, while Governance = 1 * Large Outside Blockholder is an interaction term between the dummy variable for the first decile of the Governance Index and the Large Outside Blockholder dummy. The other interaction terms are defined in a similar way. The reported regressions include only purchase transactions. The regressions for sales transactions and those for purchases and sales controlling for whether the director is strictly independent are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the nonindependence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

One possible explanation of these results is that they are driven by the extent of analyst coverage. Higher analyst coverage may lead to more informative stock prices and lower trading profits and, to the extent that analyst coverage is correlated with corporate governance attributes, the measures proxying for corporate governance may be picking up the effect of analyst coverage. To check whether this is the case, we re-ran the specification of Table 6 controlling for analyst coverage (unreported). Analyst coverage reduces the gap between the insiders, and independent directors' returns and the market return. However, the difference in returns between executives and independent directors does not change and the overall effect of corporate governance quality on trading profits is also unchanged.

We also find (not reported) that all the individuals do worse than the market when selling the company stock in well-governed firms. However, the negative abnormal return turns positive as the Governance Index gets worse. Controlling for whether the directors are strictly independent does not change this result.

5.2 Do committee membership and attendance matter for the acquisition of information?

We have committee membership data only for one subsample, which is described in Section 2.1. The committees analyzed are the audit committee, the compensation, the nominating, the corporate governance, and the executive

committees. The audit committee nominates the external auditor, and ensures that the financial statements are accurate, complete, and reliable. The compensation committee reviews the compensation package of the CEO and the other officers. The nominating committee oversees the size and composition of the board and proposes the new board members to be elected. The corporate governance committee oversees governance practices and establishes criteria to evaluate the board members and the officers. Finally, the executive committee acts on behalf of the full board outside meeting times and has responsibilities and powers that vary across firms. Adams (2003) provides a more detailed description of the characteristics of each committee and indicates that all of them have a monitoring role as their main duty, with the exception of the executive committee, which has a strategic role as well.

Table 7 reports the regression coefficients obtained when controlling for committee membership. The executives earn on average a 10.85% abnormal return, while the returns of the independent directors vary depending on which committee they are sitting on.²¹ In particular, when we separate the independent directors into *strictly independent* (according to the Higgs Report's criteria) and other outside directors, we find that the strictly independent directors sitting on the audit committee earn 1.89% more than the executives sitting on the same committee, while the other outside directors earn 12.39% less. The interaction between a strictly independent director and the audit committee and the audit committee dummy are jointly statistically significant at the 1% level.²² Interestingly, the strictly independent directors sitting on the compensation committee earn significantly less than the executives: -17.67%, which is significant at the 5% level. The other outside directors earn 20.90% more, but this is not statistically significant. Since belonging to the audit committee implies better knowledge of the firm's financial statements, we would expect that, if trading performance reflects information at all, its members will have a better trading performance than the others. Also, the people that should benefit most from sitting on a committee are the strictly independent directors, as other individuals get information by working at the company or through informal channels by virtue of their close relation to the officers. Our findings confirm this conjecture.

Finally, strictly independent directors sitting on the executive committee earn higher returns than the executive sitting on the same committee, while those on the governance and the nominating committees do not earn sizably different returns than the executives.

²¹ To make sure that any difference in the findings is due to the additional regressors, rather than the different sample, we have re-run the base regressions on this subsample (not reported). The results are the same as those in panel A of Table 2.

²² Panel B in Table 7 reports the *p*-values of F tests of the null hypothesis that the coefficients of dummy that trading is done by an audit committee member and the interaction between this dummy and the strictly independent dummy are jointly equal to zero.

Table 7
Executive officers and independent directors trading: committees

Panel A					
Purchases					
Market-adjusted return of holding the individual position					
	(1)	(2)	(3)	(4)	(5)
	RET(t)	RET(t)	RET(t + 60)	RET(t + 90)	RET(t + 180)
Constant	-0.14*** (0.05)	3.62*** (0.20)	6.07*** (0.30)	5.98*** (0.37)	10.85*** (0.60)
Audit Committee	0.71 (0.66)	0.72 (2.92)	13.98 (12.04)	13.27 (10.69)	9.68 (14.88)
Strictly Indep Dir * Audit Committee	-0.01 (0.47)	-0.60 (1.59)	-3.57 (2.54)	-2.49 (3.37)	1.89 (5.89)
Other outside Dir * Audit Committee	-0.67 (0.81)	-0.28 (3.25)	-10.15 (11.94)	-10.87 (11.04)	-12.39 (16.10)
Outside Blockholder * Audit Committee	1.02 (1.77)	-0.30 (4.89)	-8.38 (14.11)	-0.69 (17.66)	-3.41 (20.89)
Compensation Committee	0.71 (0.51)	-1.21 (1.91)	1.65 (5.27)	-2.82 (5.22)	-3.82 (10.33)
Strictly Indep Dir * Compensation Committee	-0.50 (0.43)	-2.64* (1.51)	-4.65* (2.74)	-4.99 (4.36)	-17.67** (8.69)
Other outside Dir * Compensation Committee	-0.29 (0.64)	3.41 (2.35)	2.53 (5.65)	7.65 (6.73)	20.90 (13.69)
Outside Blockholder * Compensation Committee	-0.83 (1.14)	1.95 (4.34)	0.61 (7.47)	18.95* (11.17)	5.44 (16.07)
Corporate Governance Committee	0.65 (0.86)	1.29 (2.54)	1.58 (3.48)	3.80 (3.89)	-9.78 (7.01)
Strictly Indep Dir * Corp. Gov. Committee	0.42 (0.73)	0.61 (2.36)	4.23 (3.48)	4.90 (3.68)	0.64 (6.53)
Other outside Dir * Corp. Gov. Committee	-0.87 (1.16)	-0.22 (3.31)	-4.19 (4.68)	-6.74 (5.14)	9.00 (9.03)
Outside Blockholder * Corp. Gov. Committee	0.27 (1.60)	2.21 (22.10)	31.03 (19.62)	11.53 (15.33)	64.06** (32.58)
Nominating Committee	-0.50 (0.40)	-2.00 (1.74)	-2.04 (2.50)	0.02 (2.95)	5.92 (5.59)
Strictly Indep Dir * Nominating Committee	-0.71 (0.44)	-0.46 (1.84)	0.22 (2.91)	-1.88 (3.68)	0.31 (7.08)
Other outside Dir * Nominating Committee	1.03* (0.59)	2.33 (2.40)	1.32 (3.72)	1.72 (4.58)	-4.45 (8.70)
Outside Blockholder * Nominating Committee	0.46 (1.19)	-1.84 (3.70)	-4.13 (4.72)	-8.80 (6.73)	-9.90 (11.64)
Executive Committee	0.16 (0.23)	0.62 (0.96)	1.89 (1.59)	0.24 (1.76)	2.32 (2.91)
Strictly Indep Dir * Executive Committee	1.88** (0.75)	0.11 (2.17)	0.49 (3.68)	3.55 (4.37)	5.25 (9.54)
Other outside Dir * Executive Committee	-1.76** (0.75)	-1.36 (2.10)	-3.83 (4.36)	-5.92 (4.84)	-9.67 (10.02)
Outside Blockholder * Executive Committee	-0.39 (0.84)	5.97* (3.46)	10.67*** (4.10)	13.24 (8.88)	13.40 (8.94)
Transaction	-0.58 (1.89)	-1.35 (7.85)	13.22 (9.07)	16.42 (11.29)	34.64 (27.76)
Holdings	0.01 (0.01)	-0.07** (0.03)	-0.08* (0.04)	-0.07* (0.04)	-0.20*** (0.07)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	14,009	14,009	14,003	13,998	13,929
R-squared	0.16	0.24	0.28	0.34	0.40

(continued overleaf)

Table 7
(Continued)

Panel B: Joint statistical significance					
	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Audit Committee, Audit Committee * Str Indep	0.02	0.00	0.00	0.00	0.00
Audit Committee, Audit Committee * Outside Dir.	0.02	0.00	0.00	0.00	0.00
Compensation Committee, Compensation Committee * Str Indep	0.01	0.00	0.00	0.00	0.00
Compensation Committee, Compensation Committee * Other Outside Dir.	0.02	0.00	0.00	0.00	0.00

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. Strictly independent director is a dummy equal to 1 if the director is classified as strictly independent according to the criteria of the Higgs Report. The Higgs Report defines as independent those directors who are not employees, former employees, nor employees of an organization to which the firm gives charity contributions, do not provide any professional service to the company, are not a relatives of any officer, do not have interlocking directorship with one of the executives, or any other affiliation with the company. The committees variables (e.g., audit committee, governance committee, etc.) are indicator variables equal to one if the individual belongs to a given committee, and zero otherwise. The interaction terms such as Strictly Independent Director * Audit Committee and Strictly Other Outside Director * Audit Committee are indicator variables equal to one if the individual belongs to a committee and it is also a strictly independent director or an outside director who is not strictly independent, respectively. The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the non-independence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Panel B reports F tests of the joint significance of some of the coefficients. For example, the first row of the table reports the F test of the joint significance of the coefficients of the Audit Committee dummy and the interaction term between Strictly Independent dummy and Audit Committee dummy. The other rows can be interpreted in a similar way.

There may be different reasons why certain committees are associated with higher average returns, and, more generally, why independent directors earn positive abnormal returns. One reason may be that their duties involve the acquisition of different types and varying degrees of information, which can be used in their trading. An alternative explanation is that the executives provide information to the independent directors in exchange for less monitoring activity. Distinguishing between these two conflicting hypotheses is very hard. Nevertheless, if the executives reward directors by providing them with more inside information, it is more likely that independent directors sitting on the compensation and nominating committees will earn higher returns, as the executives may have more incentives to bribe those independent directors. On the contrary, if the independent directors acquire information over the course of their duties as board members, it is more likely that directors on the audit committee, who are exposed to financial information, will earn higher returns. The results in Table 7 provide some tentative evidence consistent with the “informed director” explanation rather than with the “bribed director” one.

The good trading performance of the strictly independent directors sitting on the audit committee is consistent with the hypothesis that the independent directors acquire information on the job. However, there are at least two alternative interpretations of this result. First, it is possible that the better trading performance is due to a selection effect. If individuals that are better at trading are more likely to be selected to sit on certain committees, then their superior trading performance is erroneously attributed to their participation on a given committee, rather than to individual ability. The ideal way to address this issue would be to add individual fixed effects to the regressions, on top of the firm fixed effects. Unfortunately, this proves very difficult from the econometric point of view since different individuals join and leave a firm at different times and move to and from other firms.²³ While it is possible that individual trading abilities are part of the explanation, our results indicate that, on average, being on the audit committee is associated with below average returns. The returns are higher only for strictly independent directors on the audit committee. If the trading returns are due to ability and not information, the implication would be that the average outside director on the audit committee has lower abilities than the rest of the individuals trading in our sample, while the average strictly independent director sitting on the audit committee has better trading abilities than anybody else. Additionally, if trading skills were the only reason for the differences, we should see that attending the meetings regularly does not have any effect on trading performance. However, we find the contrary, that independent directors who attend less than 75% of the meetings earn significantly lower returns; albeit, this is not statistically significant at all horizons. These results are reported in Table 8, along with the finding that the executives who attend less than 75% of the meetings make more money in their purchase transactions than executives with higher attendance. The dummy on low attendance and the interaction term between attendance and independent director are jointly significant at the 10% level ($p = .0795$).

Another possibility is that audit committee membership is highly correlated with tenure on the board, and this variable proxies for a tenure effect. While it is not in contradiction with our interpretation, this possibility raises the issue that information is acquired over time, rather than through participation in specific committees. To study this hypothesis, we re-ran the basic regressions adding tenure and the interaction of tenure and trader identity. Our basic results do not change and the coefficient on tenure is not significant.

These findings provide suggestive evidence that independent directors possess information about the current and future conditions of their company. Consistent with our intuition, committee membership and attendance are important means of information acquisition for the strictly independent directors,

²³ The results are heavily dependent on whether the firm or the individual fixed effects is estimated first. See Abowd, Kramarz, and Margolis (1999) for a structural framework that addresses this issue for a special case in the context of labor markets.

Table 8
Executive officers and independent directors trading: attendance

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	-0.18* (0.10)	2.66*** (0.47)	5.65*** (0.90)	4.51*** (0.94)	6.56*** (1.47)
Independent Director	0.09 (0.13)	0.61 (0.60)	-0.65 (1.12)	-0.36 (1.19)	1.01 (1.86)
Large Outside Blockholder	0.39 (0.47)	-0.51 (1.73)	6.37** (3.19)	11.04* (5.71)	14.84* (8.55)
Attended Less than 75% of Board/ Committee Meetings	2.11 (2.89)	-13.15*** (4.72)	11.19 (11.63)	8.96* (5.36)	18.67 (21.86)
Attended <75% * Indep Dir	-2.21 (2.90)	13.78*** (4.99)	-13.30 (11.86)	-13.61** (5.93)	-25.83 (22.13)
Attended <75% * Outside Blckhldr	-2.81 (2.90)	18.89*** (5.82)	-10.35 (12.35)	-3.24 (8.33)	-3.51 (23.08)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	37,263	37,263	37,203	37,119	36,566
R-squared	0.12	0.21	0.27	0.27	0.35
Joint statistical significance					
Attendance, Attendance * Indep Director	0.71	0.02	0.41	0.05	0.08

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. Attendance is an indicator variable that is equal to one if the director attended less than 75% of the meetings. The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the non-independence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. At the bottom of the table we report F tests of the coefficients of the Independent Director dummy and the interaction term between Independent Director dummy and the Poor Attendance dummy.

who might have less access to informal communication channels and do not work in the firm every day.

A related question is whether independent board members of firms whose board meets often learn more about the firm due to the frequency of the meetings. To investigate this possibility, we augmented our dataset with data from Board Analyst Database from Wharton. Among other things, the dataset reports the number of full board meetings held the previous year, as reported in the most recent proxy filing for the period between 2001 and 2006. Unfortunately, this dataset covers only a tiny fraction of our time line (2001–2003) and it does not have a large coverage. After merging the Board Analyst data with our data, we were left with 2300 observations. Nonetheless, we divided the sample into two subgroups: firms with frequent meetings (seven or more meetings a year) and firms with less frequent meetings (less than seven meetings a year) and re-ran our basic specifications. The results (not reported) show that the difference

Table 9
Executive officers and independent directors trading: size of the board

	Purchases				
	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	0.17 (1.04)	8.40 (5.34)	4.17 (9.39)	12.42 (11.07)	41.64** (16.39)
Independent Director	0.10 (0.09)	-0.86* (0.48)	-3.96*** (0.84)	-4.29*** (0.94)	-5.80*** (1.43)
Large Blockholder	0.66* (0.35)	-1.85 (2.08)	3.1 (3.49)	13.97* (8.25)	15.65 (10.95)
Board size	-0.18 (0.44)	-2.08 (2.26)	1.53 (4.00)	-2.03 (4.69)	-13.01* (6.93)
Large board if Independent Director	0.09 (0.15)	0.96 (0.77)	2.63** (1.12)	3.57** (1.41)	6.03*** (2.15)
Large board if large blockholders	-1.75** (0.84)	-4.13 (3.24)	-1.83 (6.28)	-21.85** (9.63)	-19.20 (14.47)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	14,472	14,472	14,462	14,435	14,202
R-squared	0.12	0.24	0.29	0.31	0.38

The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of investing 1 dollar mimicking the trade in the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. Board size is the natural logarithm of the size of the board, and is available from Fich (2005) and Fich and Shivdasani (2006). Large board if independent director and large board if large blockholder are indicator variables if the board is large (above the 75th percentile) and the individual trading is an independent director (but not a large blockholder), and a large blockholder, respectively. The reported regressions include only purchase transactions. The regressions including only sale transactions are available upon request. All the regressions include firm fixed effects. The standard errors are corrected for the non-independence of the observations within the same individual. The symbols ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

between the trading profit of top executives and independent directors is lower in firms with more frequent meetings.²⁴

5.3 Effect of board size on trading returns

The empirical corporate governance literature stresses the importance of board size for firm performance and the monitoring abilities of directors. Large boards do not function properly because of free-riding issues, diseconomies of scales, and lack of decisiveness. Kaplan and Gertner (1996) analyze a sample of reverse-leveraged buyout firms, whose boards are supposed to be value maximizing, and find that such boards are smaller, own a larger equity stake, and meet less often. Yermack (1996) shows that firms with smaller boards have higher valuations and better financial ratios, and that they provide more performance-related incentives to the top officers.

Table 9 reports the results for purchase transactions. In a firm with an average board size, equal to ten members, the executives' average market-adjusted

²⁴ These results can only be considered tentative: it is very likely that firms with more frequent board meetings have very different characteristics than firms with less frequent board meetings. Since we have a very select sample of observations, we cannot be sure of the robustness of these results.

return is 10.99%, significant at the 5% level. In this subsample, the difference between executives and independent directors is quite substantial, 5.8%, and statistically significant. To check whether this is due to controlling for board size, rather than a feature of the subsample itself, we performed the same base regressions on this subsample as in Table 2 and found that the difference between executives and independent directors is a feature of the sample.²⁵

Consistent with previous studies, a bigger board is associated with lower returns, even after controlling for firm fixed effects. An increase in one standard deviation in the size of the board generates a 12% drop in returns. Interestingly, we find that independent directors sitting in larger boards earn significantly higher returns that are comparable in magnitude to the executives' returns. One explanation consistent with this finding is that on a larger board there are more independent directors and this makes it easier for them to acquire information. Many studies underscore the importance of the fraction of independent directors for monitoring. Hermalin and Weisbach (2003) survey the literature on the role and the effects of boards of directors and document that the fraction of independent directors on the board is not correlated with firm performance. However, boards with more independent directors tend to make better decisions regarding takeovers and on CEO compensation and replacement (see, for example, Weisbach 1988; Dahya and McConnell 2005). Morck (2004) and Adams, Almeida, and Ferreira (2005) investigate the effect of board composition on its effectiveness and illustrate how the identity of the members and the balance between executives and independent directors is an important determinant of board effectiveness. Summary statistics on our sample verify that firms with larger boards have on average more independent directors.

6. Are the Independent Directors Informed in Times When the Firm Does Poorly?

Thus far in our analysis, we have focused on purchases by independent directors and executives, because these transactions are generally more likely to be information-driven. However, one concern about our findings is that the independent directors might be informed only when things are going well, and the officers want them to be informed, yet they might lack access to information exactly at those times when it is crucial for monitoring purposes.

Unfortunately, figuring out whether directors are informed about the firm's gloomy prospects when making sales transactions is very difficult, as they may trade for reasons other than information (e.g., diversification and rebalancing motives) and may be reluctant to trade on negative information for fear of legal consequences. Table 2, and the findings of the insider trading literature, confirm that officers and independent directors earn on average negative market-adjusted returns when selling the company stock.

²⁵ Such difference is 4.28% when no controls for board size are included in the regressions.

To overcome this problem, we focus on two instances in which sales are more likely to be information-driven: (i) periods before significant drops in the stock price (adjusted for market-wide movements in prices), which we label as “bad news,” and (ii) periods around earnings restatements that are due to accounting irregularities. The first test aims to identify negative events for the company and study whether independent directors sold the stock before such event became public and, subsequently, enjoyed high returns. The advantage of such an approach is that it lets the market judge the gravity of the event, instead of searching for firm-specific bad news where we run the risk of omitting some events. Also, it is a conservative test to the extent that the directors might be informed about the bad news and still be unable to trade due to an upcoming earnings announcement, a blackout period, or for fear of violating insider trading regulations. However, the drawback of this approach is that some of the price drops might have been caused by the fact itself that the officers and the directors traded and the market interpreted it as a bad signal about the firm prospects. This concern is partially mitigated by the finding that the market does not react to trading by officers and directors (Lakonishok and Lee 2001), but the possibility cannot be eliminated.

Using earnings restatements as the “bad news” does not suffer from this reverse causality problem. Although this test involves a much smaller sample of firms, it complements the evidence from the first test.

6.1 Bad news

We define as “bad news” the top 10% drops in the firm’s stock price, adjusted for market-wide price movements. This corresponds to an average -7.34% daily market-adjusted return, indicating that such price drops are substantial.²⁶ For each piece of “bad news,” we then check whether any independent director or officer traded in the 120 trading days preceding it, the average number of trades officers and directors made before each piece of bad news, and the average and median market-adjusted return associated with such trades.

Panel A of Table 10 shows that there are almost 2.3 million cases of market-adjusted price drops that meet our criterion. Of these, roughly half, 1,126,325, are preceded by a trade: 266,034 are preceded by both officers’ and independent directors’ trades, 351,716 are preceded only by officers’ trades, and 242,541 are preceded by only independent directors’ trades.²⁷ On average, the independent directors make 3.14 trades for each piece of bad news on which they trade alone and 4.17 trades for each bad news on which they trade at the same time as the

²⁶ The median daily market-adjusted return is -6.01% .

²⁷ Since it is likely that the officers of the firm are informed about its prospect at all times, the fact that we observe trades only in half of the cases is consistent with the idea that these individuals may not be able to trade during certain times irrespective of whether they have information or not. Despite this, we cannot determine whether the independent directors are informed in this case; a comparison of the bad news that are accompanied by trades and those that are not indicate that the average and median price drops are of similar magnitude and so is their standard deviation.

Table 10
Executive officers and independent directors sales: bad news and earning restatements

	Panel A: Sales transactions around bad news				
	No trade	Both independent directors and officers traded		Only officers traded	Only independent Directors traded
		Officers	Independent Directors		
Number of Bad News	1,172,556	266,034	266,034	351,716	242,541
Number of trades (total)		913,755	651,327	1,004,948	416,357
Number of trades (average by piece of bad news)		5.85	4.17	3.46	3.14
Number of trades (median by piece of bad news)		3.00	2.00	2.00	2.00
Average Mkt-Adj. Return on the day of the bad news	-7.82%	-6.27%	-6.27%	-6.81%	-6.87%
Median Mkt-Adj. Return on the day of the bad news	-6.44%	-5.19%	-5.19%	-5.57%	-5.67%
Std Dev of Mkt-Adj. Return on the day of the bad news	5.68%	4.35%	4.35%	4.81%	4.90%
Average Mkt-Adjusted Return (at the 0 trading days horizon)		-0.74%	-0.60%	-0.36%	-0.12%
Average Mkt-Adjusted Return (at the 30 trading days horizon)		-0.55%	-0.06%	2.15%	1.74%
Average Mkt-Adjusted Return (at the 60 trading days horizon)		0.90%	2.13%	4.64%	3.65%
Average Mkt-Adjusted Return (at the 90 trading days horizon)		3.00%	4.38%	5.72%	4.67%
Average Mkt-Adjusted Return (at the 180 trading days horizon)		3.42%	4.05%	5.13%	3.31%
Median Mkt-Adjusted Return (at the 0 trading days horizon)		-0.26%	-0.18%	-0.069%	0.097%
Median Mkt-Adjusted Return (at the 30 trading days horizon)		0.98%	1.34%	2.57%	3.63%
Median Mkt-Adjusted Return (at the 60 trading days horizon)		3.63%	4.28%	5.78%	6.31%
Median Mkt-Adjusted Return (at the 90 trading days horizon)		6.17%	7.27%	8.08%	8.54%
Median Mkt-Adjusted Return (at the 180 trading days horizon)		10.92%	10.63%	10.31%	10.59%
Average Transaction Size		\$925,429	\$947,323	\$380,495	\$448,547
Median Transaction Size		\$142,627	\$140,000	\$96,250	\$38,100

Panel B: Sales transactions around earning restatements

	Market-adjusted return of holding the individual position				
	(1) RET(t)	(2) RET(t + 30)	(3) RET(t + 60)	(4) RET(t + 90)	(5) RET(t + 180)
Constant	-0.70*** (0.17)	5.26*** (0.51)	8.38*** (0.67)	3.87*** (0.69)	4.06*** (0.61)
Independent Director	-0.87 (0.71)	6.04*** (1.81)	1.88** (0.93)	0.98 (0.82)	-0.81 (3.01)
Large Outside Blockholder	4.42*** (0.63)	-25.04*** (6.56)	-9.42** (4.42)	-12.00*** (2.52)	-25.03*** (0.21)
Revenue Recognition	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-14.12 (0.00)
External Prompter	1.25 (0.00)	-5.49*** (0.00)	-11.46*** (0.00)	12.96*** (0.00)	0.00 (0.00)
RevRec*IndepDir	1.18 (0.80)	-3.96* (2.13)	-3.70* (1.92)	-1.97 (3.21)	-0.43 (3.57)
ExtPr*IndepDir	4.04*** (1.23)	-0.96 (5.30)	-0.84 (4.90)	-5.87*** (2.05)	-0.05 (3.74)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	339	339	339	339	337
R-squared	0.43	0.89	0.88	0.92	0.95

In panel A, we identify for each firm the largest 10% price drops adjusted for market-wide price movements and we label them "bad news." We then keep the transactions that occurred between 0 and 120 trading days before the price drop (all the transactions turn out to be sales). The average and median market-adjusted returns are the returns of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the returns of selling 1 dollar worth of the company stock minus the return of taking the opposite position in the value-weighted market index). Transaction size is the dollar value of the transaction. Panel B reports the results for a subsample of firms that restated their earnings due to accounting irregularities. We use a dataset collected by the U.S. General Accountability Office that includes companies that restated earnings between Jan 1, 1997, and June 30, 2002. We analyze the transactions (which turn out to be all sales) that took place within (-40, +40) trading days around the restatement announcement. The dependent variable is the market-adjusted return of holding the individual's position for 0, 30, 60, 90, and 180 trading days, respectively (i.e., the return of selling 1 dollar worth of the company stock minus the return of taking the opposite position in the value-weighted market index) multiplied by 100 to make the coefficients in percentage form. Independent director is a dummy equal to 1 if the individual is an independent director, but not a large outside blockholder; large outside blockholder is a dummy equal to 1 if the individual is a director on the board, is not an officer, and owns more than 10% of the company stock. Revenue Recognition is a dummy variable equal to 1 if the reason for the restatement was revenue recognition. External prompter is dummy variable equal to 1 if the entity that started the restatement is outside the firm (auditor, FASB, or SEC). RevRec*IndepDir is the interaction between the Independent Director dummy and the Revenue Recognition dummy. Similarly, ExtPr*IndepDir is the interaction between the Independent Director dummy and the External Prompter dummy. All the regressions include firm fixed effects. The standard errors are corrected for the nonindependence of the observations within the same individual.

officers. The average and median market-adjusted returns of the independent directors indicate that they are informed about bad news concerning the firm in advance of the market: at the 180 trading days horizon, the independent directors make on average 4.05% above the market return when they trade at the same time as the officers and they make 3.31% when they trade alone. For comparison, the officers make 3.42% when they trade at the same time as the independent directors and 5.13% when they trade alone. The median returns confirm these results and are even higher. Moreover, these returns are not associated with small transactions: the average transaction size for the independent directors is \$947,322 when they trade at the same time as the officers and \$448,547 when they trade independently. These transactions are then compared to the average size of \$800,165 for all sales transactions and reported in panel A of Table 1.

The results also indicate that there are several cases in which both directors and officers trade on the same piece of news, but there are as many cases in which only the independent directors trade and make money while making open market sales. This result is at odds with the interpretation that independent directors earn high returns by simply imitating officers' trades.

An alternative way to investigate the same question is to study whether independent directors and insiders trade just before negative earning announcements are released to the market. To identify unexpected negative earnings announcements, we chose negative earnings that caused a negative stock market reaction. Specifically, we define a market reaction as negative if the 3-day CAR around the announcement date fell in the bottom quartile of the CAR for that specific company and was less than -2% . We analyze whether executives and independent directors sold stocks of the company in the 40 days before the announcement (it is not possible to use the 120 trading day window like for the bad news, as the event windows for different announcements would overlap). Similar to our findings on bad news, the results (not reported) confirm that independent directors and executives make substantial profits when they sell the stock during these episodes. However, we also find that very few trades precede a bad earning announcement, that the transaction size is significantly lower than the average transaction in our sample, and that sales tend to be executed in more than one trade. These features could be due to the existence of blackout periods and the risk of incurring an SEC investigation.

6.2 Earning restatements

We analyze a subsample of firms that restated their earnings between January 1997 and June 2002. This sample was collected by the U.S. General Accountability Office (GAO) and is described in detail in Section 2.1.

The insider trading literature documents that insiders are aware of whether the earnings will be restated well in advance of the restatement. Baneish (1999) shows that insiders' sales are abnormally high after earnings announcements that are eventually restated. Our question is whether there is any difference

in the behavior of officers and independent directors in firms that experience earnings restatements.

Panel B of Table 10 shows that the independent directors earn significantly higher returns than the market when they sell the company stock in a window of -40 and $+40$ trading days around the earnings restatements, even higher than the returns earned by the executives. The independent directors earned on average 4.87% more than the market, while the officers earned 4.06% more than the market. Both returns are significantly different from zero. We also control for whether the restatement was prompted by an entity outside the firm (usually the SEC, the FASB, or the auditor), and whether these features have a differential impact on the trading of independent directors and officers. We find that this is not the case.

One drawback of the dataset is that it does not report the size or the direction of the restatement. However, we know that the majority of earnings restatements lead to a negative stock market reaction, which is consistent with a negative adjustment to earnings. Furthermore, when the restatement is due to revenue recognition, it generates the most negative market reaction (Anderson and Lombardi Yohn 2002). Another issue is related to the nature of the restatements. A recent paper by Hennes, Leone, and Miller (2007) documents that, although the GAO describes the sample's restatements as due to accounting irregularities (intentional misstatements), a fraction of them are actually unintentional errors with a minor effect on the firm's profitability and stock price. The paper proposes shareholders' lawsuits following the restatements as an alternative measure of fraudulent earnings announcements. For the purposes of this paper, earning restatements are a better measure as the officers and the directors might not know when the lawsuits are going to occur and so it is harder for them to trade in advance of such information. Moreover, the fact that the officers' and directors' trades earn significant abnormal returns indicates that they are likely trading in advance of the restatements that correspond to a significant drop in stock prices.

In unreported regressions, we also estimate whether the probability of making a sales transaction before a restatement differs across categories of traders. If an informed trader is aware that the earnings posted by the company are not accurate, the individual should be more likely than an uninformed trader to sell before the earnings restatement. We find that the independent directors are slightly more likely than the executives to sell before such announcement, but that this effect is neither economically nor statistically significant.

7. Conclusions

This paper investigates the information available to the independent directors sitting on the board of U.S. corporations in order to shed light on their monitoring ability. By analyzing the open market trades for a sample of U.S. officers and independent directors, we find that the independent directors

earn positive and substantial abnormal returns when they purchase their company stock and that the difference between the independent directors and the firm's officers is relatively small at most horizons. The results are robust to controlling for the size of the transaction and the stock holdings and for various proxies of risk, such as firm size, book-to-market, and past return volatility. We also analyze the effect of governance quality on trading returns and find that our results hold for most of the firms with the exception of those with the weakest governance, where both the executives and the independent directors make higher returns when buying their company's stocks. Also, in such firms, the difference between the abnormal returns of the executives and the independent directors widens: the executives earn substantially higher market-adjusted returns than the independent directors, suggesting that in such firms, the independent directors acquire less information than the insiders.

To better understand whether directors acquire information about the firm through their committee work or through informal channels and personal contact with the management, we analyze how their returns vary depending on their participation on committees and their attendance at board meetings. We find that when the independent directors sit on the audit committee, they earn higher abnormal returns than otherwise. Moreover, independent directors who attend the meetings regularly earn higher returns than those who do not, although the difference is not always statistically significant. As expected, the executives who sit on the audit committee and attend board meetings regularly do not earn higher returns than other executives since they acquire the information about the company every day on their jobs. We also find that independent directors on larger boards earn higher abnormal returns when buying their company stock, possibly because more serve on such boards and it is easier for them to acquire information.

Our results on open market purchases suggest that independent directors have information about the firm, at least to the extent that it allows them to trade profitably. However, this evidence only suggests that independent directors have information about their company in normal times, but they may be kept in the dark at times the company is performing poorly.

By focusing on a subsample of sales transactions that are likely to be information-driven, we can distinguish whether independent directors are timely informed when the firm is performing poorly and their monitoring role is potentially more crucial. For each firm, we identify the 10% worst price drops (adjusted for market-wide movements) and we compare the trading behavior of independent directors and officers in a 120 trading day window before the price drop. We find that the number of trades made by the two groups of traders is similar and that their returns are positive and of similar magnitude. By examining the time pattern of such trades, we also find evidence refuting the possibility that the positive returns of independent directors are due to them simply mimicking the officers' trades. Further evidence on the trading activity of independent directors in firms that restated their earnings provides support

to the conclusion that independent directors are on average timely informed not only when their firm does well, but also when it performs poorly.

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