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Corporate policies restricting trading by insiders☆

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Abstract

This paper examines policies and procedures put in place by corporations to regulate trading in the stock by the firm's own insiders. Over 92% of our sample companies have their own policies restricting trading by insiders, and 78% have explicit blackout periods during which the company prohibits trading by its insiders. Our data indicate that blackout periods successfully suppress trading, both purchases and sales, by insiders, and that the blackout period is associated with a bid–ask spread that's narrower by about two basis points. Consistent with this effect on the spread, allowed insider trades are modestly more profitable than insider trades made during prohibited blackout periods.

JEL classification: G14; G18; G38; K22; L22

Keywords: Insider trading; Regulation; Corporate policy; Liquidity

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1. Introduction and motivation

Corporate managers, officers, and directors face incentives and disincentives to trade on inside information. Trading on information concerning an impending control contest or higher-than-expected earnings, for example, can provide large profit opportunities. On the other side, insider trading is regulated by the rules and regulations promulgated by Congress and the SEC under the Securities Exchange Act of 1934 and its amendments.[1]

This paper examines another way by which insider trading potentially is regulated, namely through monitoring of trades and restrictions on trading imposed on directors, officers, and employees by the firm itself. To date, researchers have focused on federal regulation of insider trading, leaving the question of company-level regulation of insider trading relatively unexamined. One possible reason for this lack of attention is that such corporate policies are perceived to be uncommon. For example, Seyhun (1992) randomly sampled company code of ethics documents in place as of November 1990, finding that only about one-fourth of the companies explicitly caution against insider trading.

In contrast, we find that company-level regulation of insider trading is widespread. By late 1996, over 92% of our sample firms have some type of policy regarding insider trading, and 78% of the sample firms have explicit blackout periods during which the company prohibits trading by its insiders. The single most common policy disallows trading by insiders at all times except during a trading window that is open during the period three through 12 trading days after the quarterly earnings announcement.

One view of such corporate compliance programs is that they primarily serve a legal purpose. Under this view, the presence of adequate rules and procedures is likely to make it more difficult for the SEC to establish that the controlling person or persons engaged in reckless activity (Steinberg and Fletcher, 1994 p. 1830) and more difficult to prosecute insiders who trade in compliance with the trading policy (Horowitz and Bitar, 1998). Gary Lynch, former Director of Enforcement for the SEC, has articulated a more extreme version of this perspective. When some individuals have regular access to material inside information, 'there could be a case where the mere fact that a firm failed to establish any policies and procedures whatsoever would be deemed to be reckless conduct' (Securities Regulation and Law Report 21, Jan. 13, 1989, p. 65). In the limit, corporate policies are a public relations ploy, providing legal protection for the firm and the firm's insiders without having any detectable effect on insider trading. Based on this argument, companies adopt policies to

[1] For a complete discussion of the legal rules and institutions related to insider trading, see Seyhun (1992), Meulbroek (1992), and Bainbridge (1998).

give the appearance of self-regulation in order to reduce their legal and regulatory exposure. In this case, the policies themselves would have no economically significant implications for the trading behavior of insiders or the liquidity of the firm's shares. If this case holds, then the literature in finance will have been justified in focusing on governmental efforts to regulate insider trading rather than on corporate self-regulation.[2]

Another view is that there is an economic rationale, beyond pure legal protection, for the form and incidence of corporate policies restricting insider trading. Certainly most of the rules and sanctions associated with insider trading impose costs, such as fines and jail time, primarily on the individuals doing the trading. However, trading by insiders also carries potential costs to the organization. For example, extensive trading by insiders with an informational advantage is likely to exacerbate the effects of asymmetric information known commonly as the lemons problem, leading to a larger bid–ask spread, lower liquidity in the market for the company's shares, and a higher discount rate. In addition, when managers are prosecuted for insider trading, the company incurs costs from lost managerial time, business disruption, and negative publicity. Further, companies can be fined for insider trading violations by their managers, and the Penny Stock Reform Act of 1990 increased these fines. Thus, an alternative to the public-relations hypothesis is that corporate policies are structured either to minimize costs, for a given level of legal protection from the regulators, or to improve the liquidity of the market for the firm's shares, or both. Self-regulation would allow the firm to avoid the restriction of contracting opportunities and departures from least-cost solutions to the organization form problem implied by one-size-fits-all regulations. Instead, shareholders could restrict managers from trading in ways that maximize the value of the firm given the characteristics of the firm's markets, hierarchy, and managers. In any case, based on this view of corporate trading policies, we expect to find that corporate self regulation has a significant effect on the rate and profitability of insider trading and improves liquidity in the market for the firm's shares.

Our results generally are consistent with this hypothesis. For firms in our sample that have blackout periods, insider trading is concentrated heavily during time windows in which trading is permitted. Insider trading activity in the blackout period is less than one-third of that during allowed trading periods. This effect is more pronounced for insider sales than purchases, and the results are not driven by a general proclivity by insiders to trade more frequently in the period immediately following earnings announcements. Thus, corporate trading prohibitions in the form of blackout periods are associated with a statistically and economically significant reduction in insider trading. In stark contrast,

[2] For example, papers that have examined the effect of federal regulations include Seyhun (1992), Meulbroek (1992), Agrawal and Jaffe (1995), Bettis and Coles (1997), and Garfinkel (1997).

recent significant increases in federal enforcement and severity of insider-trading sanctions, including the Insider Trading Sanctions Act of 1984 (ITSA) and the Insider Trading and Securities Fraud Enforcement Act of 1988 (ITSFEA), appear to have had little effect on overall insider trading activity (Seyhun, 1992). In spite of the overall trend, Seyhun (1992) does find that insider trading prior to earnings releases and takeover announcements declined following the passage of ITSFEA. He attributes these findings to the effects of case law. Our analysis suggests that the implementation of corporate policies restricting insider trading may also play a role.

The substantially lower rate of insider trading during blackout periods is manifested in greater liquidity for the shares of the firm. Our regression parameter estimates suggest that the effective bid–ask spread is about 8.5% smaller during a blackout day as compared to an allowed trading day. This difference translates to about two basis points. Contemporaneous work by Jeng (1997) finds a somewhat smaller effect, equal to about one basis point, of blackout days on the bid–ask spread. Consistent with the hypothesis that market makers face lower adverse selection costs during blackout periods, we find that the one-week abnormal profitability of insider trades made during the blackout period is about 0.5% lower compared to the abnormal profitability of trades consummated during allowed trading periods.

In Section 2, we describe the construction of our sample. In addition, we provide information on the incidence and form of corporate policies regulating insider trading. Section 3 provides evidence on the effectiveness of company trading restrictions. Section 4 studies the implications for the bid–ask spread of blackout day restrictions, and Section 5 examines the profitability of insider trading during trading windows and blackout periods. Section 6 concludes.

2. Incidence and form of policies restricting trading by insiders

In this section we describe our sample and empirical methodology and present summary statistics on the incidence and form of corporate policies restricting trading by insiders.

2.1. Sample collection

In November of 1996 we surveyed 1915 member firms of the American Society of Corporate Secretaries regarding corporate policies and restrictions on insider trading. A total of 663 firms responded to the survey for an overall response rate of 35%. We drop 10 firms from the sample because responses to different questions directly contradicted one another, leaving an initial sample of 653 firms. Of these, 626 have accounting data available from Compustat and

stock return data available from the Center for Research in Security Prices (CRSP).

While our initial summary analysis uses these 626 firms, most of our tests focus on a subsample of 403 firms that have an identifiable insider trading policy and suitable earnings announcement and insider trading data. The subsample is comprised of two groups of firms. The first group contains 284 firms that have sufficient survey data to accurately define company-mandated blackout periods around earnings announcements. The second subsample group contains 119 firms that indicate that they do not impose blackout periods. Of the 119 firms without blackout periods, 50 indicate that they have no corporate policies on insider trading, while 69 firms in this group have a trading policy that does not impose a blackout period. For these 403 firms, the insider trading data come from Primark Financial Information Division and earnings announcement data come from I/B/E/S. Since June of 1996 Primark has been on contract with the SEC to compile the publicly available corporate insider transaction data filed on Forms 3, 4, 5, and 144 by insiders. For the period prior to June 1996, Primark went back to re-compile the data that are the SEC publishes each month in the *Official Summary of Securities Transactions and Holdings*. The insider trading and earnings announcement data used cover the period January 1, 1992 through June 30, 1997.

We use the term insiders to refer to those individuals or entities defined as insiders by the SEC pursuant to Section 16a of the 1934 Securities Exchange Act (as amended) and the Penny Stock Reform Act of 1990. In sum, insiders are directors, officers, and other beneficial owners. Since May 1991, the SEC has defined the term 'officer' to include: company president; principal financial officer; principal accounting officer; any vice president in charge of a principal business unit, division, or function (such as sales, administration, or finance); and any other person who performs a policy-making function for the company. Thus, a vice president who is not in charge of a principal unit and is not a policy-maker is not considered an insider or Section 16 officer.

In our empirical analysis, we examine trades made by officers and directors. The results are the same, however, when trades by beneficial owners are included. The insider transaction data includes the name and position of the insider, the company name, the date of the transaction, the price of the security in the transaction, and the number of shares transacted. The transaction data also identifies the type of transaction, indicating whether the transaction was an open market purchase or sale, and the type of security transacted, such as common or preferred stock.

In the data available from I/B/E/S, several earnings announcements occur on days when the market is closed. For these announcements we adopt the following coding scheme. If the market is open on the day prior to the reported announcement date, we recode the earnings announcement as occurring on this date. If this test is not met, we look a maximum of two days ahead for a day

when the market is open, and recode the announcement date accordingly. If the market is closed on all three days surrounding the reported announcement date, then we delete that particular announcement from the sample.

We rely on Compustat data to identify firm size, measured as total book assets, the firm's market-to-book ratio, calculated as total book assets minus book equity plus the market value of equity divided by total book assets, and Standard Industrial Classification (SIC) code. We compute the standard deviation of monthly stock returns, including dividends, using returns from CRSP.

2.2. Nonresponse bias

A total of 1252 firms did not respond to our survey. There is potential bias introduced in our analysis if firms that did not respond are systematically more or less likely to have corporate policies on insider trading than those firms that responded. To address this issue, we estimate a logistic regression in which the classification variable is equal to one if the firm responded to our survey and zero otherwise. The explanatory variables are firm size, expressed as the log of total book assets, the market-to-book ratio, an indicator if the firm is a utility (SIC codes 4900–4939), an indicator if the firm is a bank or thrift (SIC codes 6000–6999), and the standard deviation of monthly stock returns. The regression analysis indicates that no statistically significant differences occur in these dimensions between respondents and nonrespondents.

One potential source of bias that remains is that a smaller percentage of nonrespondents are covered by CRSP and Compustat. Of the nonresponding firms, approximately 70% have accounting and stock price data, while this number increases to 94% for responding firms. A careful look at the data suggests that many of the nonrespondents are partnerships, private firms, and business units of larger firms. Therefore, the data used in our analysis are best interpreted as representative of the types of firms covered by the CRSP and Compustat data services.

2.3. Empirical methodology

Ideally, we would like to analyze the effects of corporate policies restricting insider trading around the adoption dates of these policies. Unfortunately, it is very difficult to isolate the exact adoption date. We re-surveyed a subsample of our firms with policies in place in November 1996 to determine how long the current policy had been effective and whether the firm had other policies in place prior to the adoption of the current policy. Nearly 90% of firms with a policy in place in 1996 either had the same policy in place prior to 1992, had a variant of that policy already in place prior to 1992, or adopted a policy at the firm's initial public offering (IPO) occurring after 1992. Of this subsample, 5% adopted their policies in 1993, while the remaining 5% put restrictions in place in either 1994

or 1995. Of those firms that adopted insider trading policies after 1992, many state that they had an unwritten policy in place in 1992, which was then formally codified between 1993 and 1995. In addition, many firms state that they had variants of their current policies in place prior to 1992. Based on these results, it is likely that the adoption dates, when available, do not accurately represent the initial adoption of the policy.[3] Thus, our empirical analysis is based on cross-sectional analysis of firms with different types of policies and longitudinal analysis comparing trading windows versus blackout periods within firms. Based on the finding that a high proportion of firms with a policy restricting trading in place in November 1996 also had such a policy in 1992 or at the date of their IPO, we perform our empirical analysis for the period beginning January 1992 and ending June 1997.

2.4. Incidence and form of corporate policies on insider trading

Table 1 summarizes the types of restrictions in place as of November 1996. Of the 626 sample firms, 576 (92%) report that they have company policies or guidelines that restrict insider trading activities, or regulate insider trading activities, or both. Nearly three-quarters of the responding firms (464 of 626) require approval of any potential trade by an insider before the trade is executed. A large proportion of companies have blackout periods, which are periods during which trading by insiders is not allowed.

The single most common blackout period policy defines an allowed trading window that lasts 10 trading days. The usual trading window typically begins with and includes the third trading day after the quarterly earnings announcement. In most cases, the trading window includes and ends with the twelfth trading day after the same earnings announcement. Except for rare cases in which an additional trading window is specified, trading during the complementary blackout period for the quarter, which covers the first and second trading days after the earnings announcement as well as the thirteenth trading day following the earnings announcement up until and including the day of the next earnings announcement, is prohibited without permission. Many firms use a trading window following the earnings announcement but defined over different dates. For example, some companies allow trading from the third day after the earnings announcement through the end of that calendar month. Again, the corresponding blackout period is the complementary period for that quarter.

Our view is that the genesis of the most common trading window was the requirement by the SEC that stock appreciation rights could be exercised only

[3] An independent survey of twelve Fortune 500 firms by Bragg (1999) confirms this finding. Of the 11 firms in the Bragg survey with blackout periods, nine report that they had other policies in place prior to the adoption date of the current policy. Of those with prior policies, six firms indicated that the old policy also included a blackout period.

Table 1
Types of corporate policies that restrict or limit the trading activity of corporate insiders

Sample consists of 626 survey responses (November 1996 survey) from firms that are members of the American Society of Corporate Secretaries and that have financial data available from Compustat and stock return data available from the Center for Research in Security Prices (CRSP).

	Number affirmative	Percent of all respondents ($N = 626$)	Percent of respondents with a policy restricting insider trades ($N = 576$)
Firm has trading restriction(s) in place	576	92.01	100.00
Insider trades cleared by an individual or office of the company before execution of the trade	464	74.12	80.55
Trading window from 3 through 12 trading days after earnings announcement	186	29.71	32.29
Other trading window defined in relation to earnings announcement	268	42.81	46.52
Blackout period(s) in place	489	78.11	84.89

during the day +3 to day +12 period after the quarterly earnings announcement. This requirement was rescinded recently. In Release No. 34-37260, effective August 15, 1996, the SEC adopted a new version of Rule 16b-3 that eliminates the predecessor rules (subsection (e)) applicable to cash settlements of stock appreciation rights and settlements of tax withholding rights. As far as we know, these window period provisions were the only place in the federal securities laws where the Commission directly endorsed the approach of limiting transactions by insiders to a specific period immediately after earnings announcements.

About a third of our sample firms, 29.7%, have this day +3 to day +12 trading window and corresponding blackout period, and 42.8% have some other allowed trading window and blackout period defined in relation to the earnings announcement. In rare cases, a firm restricts trading during some other blackout period. Instead of earnings announcements, other blackout periods are defined relative to dividend announcements, mergers, bankruptcy filings, board meetings, the end of the quarter, other important corporate events, or upon the possession of material nonpublic information. In total, 489 firms, or 78.1%, have at least one, and possibly more than one, period during which managers and other insiders are not allowed to trade in the shares of the company. The Appendix includes examples of different types of blackout periods.

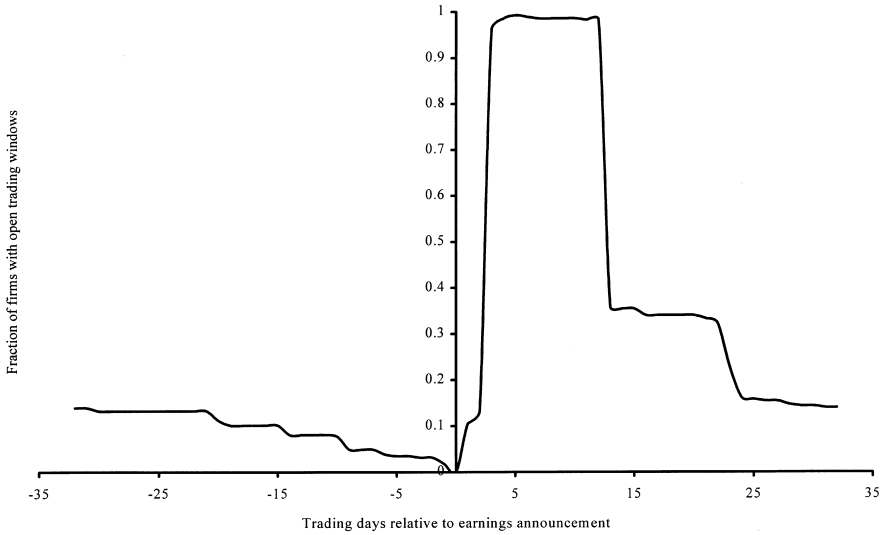

Fig. 1. Fraction of firms with open trading windows, with trading days defined in event time for each firm. Day zero is the earnings announcement day. Sample consists of 284 firms with easily defined trading windows and blackout periods.

Fig. 1 reflects the timing, relative to the earnings announcement, of allowed trading windows. In theory, if four earnings announcements are spaced evenly through the year, there are about 60 trading days between announcements and, relative to the earnings announcement, about 30 days before and after the event day. Fig. 1 reports data for slightly longer intervals before and after the event day because earnings announcements are not perfectly spaced through the year and some firms, in rare cases, postpone or even skip an earnings announcement. The figure reports the proportion of firms that allow trading for each trading day surrounding the earnings announcement. This frequency count is based on the subsample of 284 firms for which it is possible to define the blackout period relative to the earnings announcement date, and uses all earnings announcements made by these firms in 1996. As Fig. 1 shows, no firm allows trading on the earnings announcement day. In addition, nearly all firms have an open window during the day +3 to day +12 period. Many firms, about 35%, continue to allow trading for roughly ten more trading days. Thereafter, the proportion of firms that allow trading shrinks quickly, to about 15%, and then gradually drops to zero as the next earnings announcement approaches.

2.5. *Proportion of firms with trading windows open in calendar time*

Trading rates, the bid-ask spread, and insider trading profitability all depend on whether a blackout period is in effect. Each of these topics is examined in

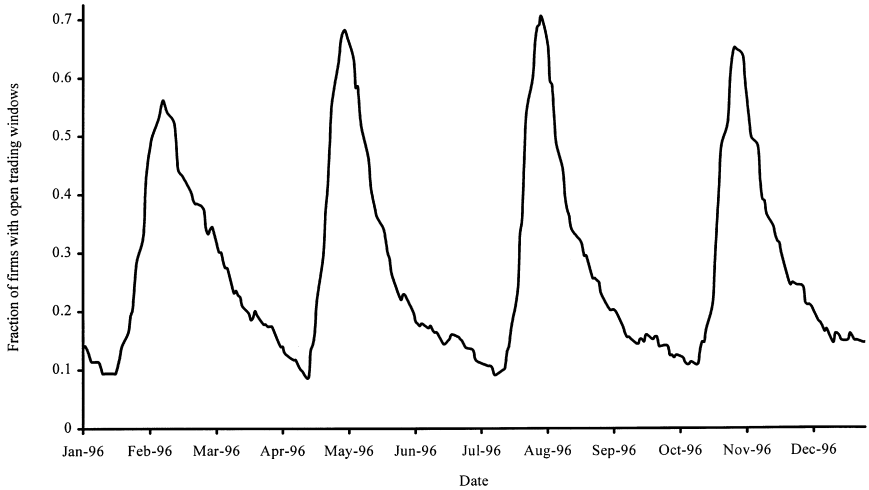

Fig. 2. Fraction of firms with open trading windows on trading days in calendar year 1996. Sample consists of 284 firms with easily defined trading windows and blackout periods.

subsequent sections of this paper. Certainly investors are interested in knowing when in calendar time there is a high likelihood of trading against a potentially informed insider. In addition, researchers are interested in assessing the effectiveness of government regulation and corporate self-regulation, as well as other issues. Thus, both investors and researchers will be attentive to the intertemporal patterns of insider trading driven by seasonality in allowed trading windows. Fig. 2 plots the proportion of firms in our sample that have an open trading window on a given trading day in calendar time for 1996. The troughs occur roughly in early January, April, July, and October, corresponding to the typical timing of earnings announcements. The peaks occur soon after, as trading windows open a few days after the announcement of earnings. The slightly broader and shorter January spike in allowed trading frequency in our data is due to more dispersion in the timing of the first earnings announcement of the year.

3. How effective are company-imposed blackout periods?

The remainder of the paper focuses on the subsample of 403 firms, including 284 firms with blackout periods. These 284 firms include 184 sample firms with a ten-day trading window that is open from three through 12 trading days after the quarterly earnings announcement. To isolate the effects of blackout periods and trading policies, our subsample also includes all firms that have trading

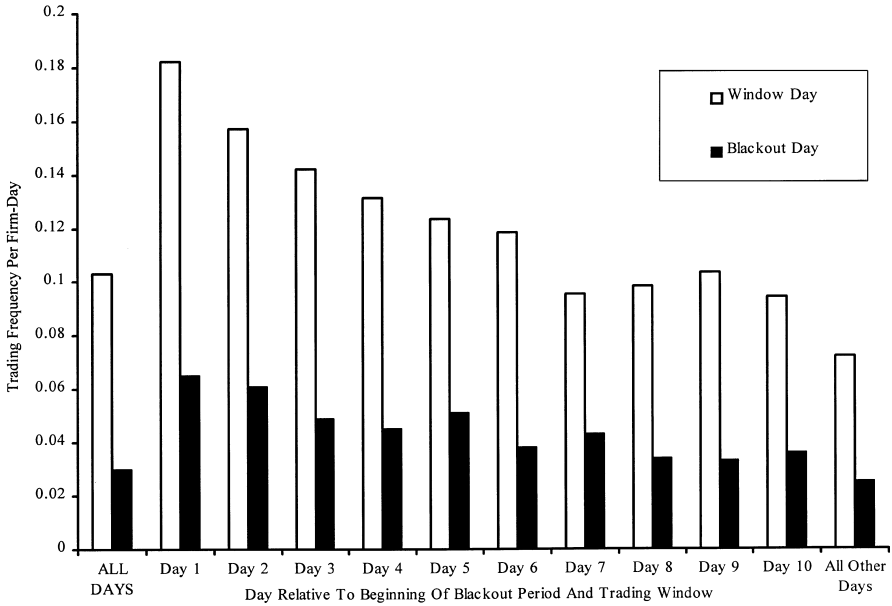

Fig. 3. Trading frequency per firm day, including purchases and sales, for all window days and blackout days, and for the first 10 days of each type of period. Sample consists of 284 firms with easily defined windows and blackout periods.

policies but no blackout period (69 firms) and all firms that have no trading policy at all (50 firms). If it is the case that the subsample reflects the population accurately, with minimal selection bias, then these figures represent the true population proportions. Daily trading data are based on the January 1992 through June 1997 period. Firm size, market-to-book ratio, and industry type are taken from reports covering the prior fiscal year. Stock return volatility is calculated based on monthly returns over the fiscal year prior to trading.

Using the insider trading records, we compute statistics on insider trades made during both trading windows and blackout periods. We use three measures of insider trading activity to assess the effectiveness of company-mandated blackout periods. The first measure is the frequency of trading, defined as the total number of insider trades divided by the number of firm-days available to trade. The second measure is the per-day dollar volume of insider trading defined as the total dollar volume of insider trading divided by the number of firm-days available to trade. Finally, we measure trading activity as the number of shares traded by insiders divided by the total share volume transacted on a particular trading day.

The far-left portion of Fig. 3 compares per-day trading rates using our first measure of trading activity, aggregating purchases and sales, for blackout days

versus allowed trading days for the 284 firms with trading windows. The average number of insider trades per allowed trading day is 0.103. During blackout period days, this rate falls to 0.030. Thus, on average, insiders trade once every 9.71 firm trading days during allowed periods and once every 33.3 days during blackout periods. In relative terms, insiders trade 3.43 times as often during trading windows than during blackout periods.

Given that trading may be concentrated in one part of the trading window or blackout period, we examine insider trading frequency for the first 10 days of each period, and for all other days excluding the first 10 days. The reason we pick 10 days is that, for all but a few of the 284 firms, both the trading period and blackout period are 10 days or longer. About 65% of the time the trading window is exactly 10 days long. On the basis of Fig. 3, two observations are immediate. First, insider trading activity during each of the first ten matched days of each period is much lower during the blackout period than during the trading window. Just as in the overall comparison, during the first 10 days, per-firm trading frequency during blackout days is about one-third of the trading frequency during allowed trading days. All 10 matched differences from Fig. 3 are significant at the 0.01 level. In addition, insider trading frequency excluding the first 10 days of each period is significantly lower, at the 0.01 level, for blackout days than window days. Second, insider trading is concentrated early in both the trading and blackout periods. A portion of this effect could be due to errors in reported earnings announcements days or in the definition of the blackout period. In general, such noise would reduce the discriminatory power of the comparison of trading activity between blackout periods and trading windows. The hypothesis of uniform trading frequency per day is rejected at the 0.05 level for both the first 10 days of the trading window and the first 10 days of the blackout period.

Although not shown, the results are essentially identical using the other measures of insider trading activity. Over all available trading days, the average dollar volume of insider trades per allowed trading day is \$32,108, as compared to \$8971 during blackout days. In relative terms, insiders trade 3.58 times more in dollar terms during trading windows than during blackout periods. The average number of shares traded by insiders relative to total share volume per allowed trading day is 0.66%, versus 0.21% during blackout days. Again, insiders are over three times more likely to trade during trading windows than during blackout periods.

Tables 2 and 3 provide multivariate comparisons of the three measures of insider trading activity for the 284 firms with trading windows and the 119 firms with other insider trading policies. Because companies claim that their trading policies have become more restrictive, more companies have adopted a policy, and insider trading rates may be increasing through time (Seyhun, 1992), we control for time with a dummy variable that equals one if the trading day is on or after January 1, 1995, the approximate mid-point of our sample period. Other

controls, such as size, market-to-book ratio, industry, and stock return volatility are included because they are likely to be correlated with both trading rates and the use of trading restrictions. For example, we expect trading activity to be positively related to firm size because larger firms are likely to have more insiders. We also expect trading activity to be positively related to stock return volatility and the market-to-book ratio if these variables capture the amount of information asymmetry between insiders and investors. Finally, we expect that firms in regulated industries will be associated with lower insider trading activity because these firms face additional scrutiny from outside regulators. Table 2 aggregates purchases and sales transactions, while Table 3 considers purchases and sales separately.

Table 2 indicates that firms with blackout periods and firms with other sorts of insider trading policies have insiders that trade more actively as compared to insiders in firms without insider trading policies. Furthermore, blackout periods appear to be increasingly effective. For 1994 and before, blackout periods suppress the per-day trading rate by about 0.067 trades per day and decrease the daily dollar volume by about $21,000 per day. After 1994, blackout periods suppress the per-day trading rate by about 0.079 trades per day and decrease the daily dollar volume by about $25,500 per day. For the measure of insider trading relative to total share volume, blackout periods reduce the fraction of volume from insider transactions by about 0.45%. Using this measure, however, we do not detect a difference in the effect of blackout periods after 1994. In addition, insider trading as a proportion of total volume actually falls slightly in the post 1994 period. These findings suggest that insider trading volume has grown at essentially the same rate as market volume. For all three measures of insider trading, trading in blackout periods is about three times less likely than trading during allowed trading windows.

For trading frequency and dollar volume, trading activity, as expected, is related positively to firm size, stock volatility, and the market-to-book ratio. Trading activity is lower in banks, thrifts, and utilities. As a proportion of total volume, trading activity is negatively related to firm size, the market-to-book ratio, and the utility industry indicator. Trading activity is related positively to a firm's membership in the banking or thrift industries. The differing signs on the control variables, using the scaled measure of trading activity, are likely due to the fact that total share volume is strongly related to the same firm characteristics, such as firm size. In unreported results available from the authors, we also show that our findings are not driven by a general tendency of insiders to trade in the period immediately following earnings announcements. After controlling for the proximity of the earnings announcement, we still find a significant reduction in trading during blackout periods.

These same patterns appear for both purchases and sales separately. The differences for sales, however, are more pronounced than for purchases. Based on univariate tests, which are not reported, insider selling activity is between

Table 2
Effects of corporate insider trading policies on overall insider trading, 1992–1997

Pooled time-series cross-section regressions of the number of trades per firm-day, dollar volume of trades per firm-day, and insider volume relative to total trading volume on indicator variables for various insider trading policies and control variables. Trading policy variables include an indicator equal to one if the firm has trading policies but no blackout periods, an indicator equal to one if the firm has trading policies and blackout periods, an indicator for blackout days, and indicator for the post-1994 period, and the interaction between the post-1994 and blackout day indicators. The control variables include the log of total assets, the market-to-book ratio, indicator variables for banks and utilities, and the standard deviation of monthly stock returns. The sample consists of all open market purchases and sales by insiders in 284 firms with blackout periods and 119 firms without blackout periods from the period January 1, 1992 to June 30, 1997. *p*-values are in parentheses.

Independent variables	Dependent variables					
	Number of trades	Number of trades	Dollar volume	Dollar volume	Relative volume	Relative volume
Intercept	0.0311[a] (0.000)	− 0.0339[a] (0.000)	1,832[a] (0.000)	− 50,524[a] (0.000)	0.0034[a] (0.000)	0.0090[a] (0.000)
Indicator for trading policy but no blackout period	0.0193[a] (0.000)	0.0069[a] (3.54)	7,402[a] (0.000)	− 4,070[b] (0.044)	0.0037[c] (0.058)	0.0016[a] (0.000)
Indicator for trading policy with blackout period(s)	0.0649[a] (0.000)	0.0541[a] (0.000)	25,877[a] (0.000)	16,839[a] (0.000)	0.0034[a] (0.000)	0.0042[a] (0.000)
Indicator for blackout day	− 0.0675[a] (0.000)	− 0.0670[a] (0.000)	− 20,956[a] (0.000)	− 21,220[a] (0.000)	− 0.0046[a] (0.000)	− 0.0044[a] (0.000)
Blackout day indicator × post − 1994 indicator	− 0.0116[a] (0.000)	− 0.0112[a] (0.000)	− 4,627[b] (0.022)	− 4,162[b] (0.042)	0.0001 (0.496)	0.0000 (0.858)

Indicator for post-1994	0.0140[a] (0.000)	0.0104[a] (0.000)	9,366[a] (0.000)	6,862[a] (0.000)	− 0.0004[a] (0.003)	− 0.0003[b] (0.050)
Log of total assets	—	0.0073[a] (0.000)	—	6,584[a] (0.000)	—	− 0.0008[a] (0.000)
Market-to-book ratio	—	0.0114[a] (0.000)	—	7,738[a] (0.000)	—	0.0002[a] (0.000)
Bank or thrift	—	− 0.0065[a] (0.000)	—	− 7,451[a] (0.000)	—	0.0012[a] (0.000)
Utility	—	− 0.0212[a] (0.000)	—	− 12,693[a] (0.000)	—	− 0.0016[a] (0.000)
Standard deviation of stock returns	—	0.1069[a] (0.000)	—	59,117[a] (0.000)	—	0.0004[a] (0.767)
F value	657.50[a]	452.53[a]	75.01[a]	104.55[a]	219.88[a]	214.48[a]

[a]Statistical significance at 0.01 level.
[b]Statistical significance at 0.05 level.
[c]Statistical significance at 0.10 level.

Table 3
Effects of corporate insider trading policies on share purchases and sales, 1992–1997[c]

Pooled time-series cross-section regressions of the number of insider trades per firm-day, dollar volume of insider trades per firm-day, and insider trading volume relative to total share volume disaggregated by purchases and sales on indicator variables for various insider trading policies and control variables. Trading policy variables include an indicator equal to one if the firm has trading policies but no blackout periods, an indicator equal to one if the firm has trading policies and blackout periods, an indicator for blackout days, and indicator for the post-1994 period, and the interaction between the post-1994 and blackout day indicators. The control variables include the log of total assets, the market-to-book ratio, indicator variables for banks and utilities, and the standard deviation of monthly stock returns. The sample consists of all open market purchases and sales by insiders in 284 firms with blackout periods and 119 firms without blackout periods from the period January 1, 1992 to June 30, 1997. *p*-values are in parentheses.

Independent variables	Dependent variables					
	Number of purchases	Number of sales	Dollar volume of purchases	Dollar volume of sales	Relative volume of purchases	Relative volume of sales
Intercept	0.0101[a] (0.000)	− 0.0441[a] (0.000)	− 2,741[b] (0.029)	− 47,784[a] (0.000)	0.0034[a] (0.000)	0.0057[a] (0.000)
Indicator for trading policy but no blackout period	0.0015 (0.118)	0.0054[a] (0.001)	− 1,261 (0.113)	− 2,909 (0.129)	0.0002[b] (0.025)	0.0014[a] (0.000)
Indicator for trading policy with blackout period(s)	0.0135[a] (0.000)	0.0406[a] (0.000)	− 184 (0.818)	17,023[a] (0.000)	0.0012[a] (0.000)	0.0030[a] (0.000)
Indicator for blackout day	− 0.0139[a] (0.000)	− 0.053[a] (0.000)	− 699 (0.289)	− 20,521[a] (0.000)	− 0.0010[a] (0.000)	− 0.0034[a] (0.000)
Blackout day indicator × post-1994 indicator	− 0.0034[a] (0.001)	− 0.0079[a] (0.000)	1,219 (0.130)	− 5,381[a] (0.004)	− 0.0001 (0.432)	0.0002 (0.239)

Indicator for post-1994	0.0058[a]	0.0046[a]	405	6,457[a]	0.0002[b]	− 0.0004[a]
	(0.000)	(0.000)	(0.477)	(0.000)	(0.023)	(0.000)
Log of total assets	− 0.0001	0.0074[a]	592[a]	5,991[a]	− 0.0004[a]	− 0.0005[a]
	(0.497)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Market-to-book ratio	− 0.0017[a]	0.0134[a]	281	7,457[a]	− 0.0003[a]	0.0001[a]
	(0.000)	(0.000)	(0.156)	(0.000)	(0.000)	(0.003)
Bank or thrift	0.0093[a]	− 0.0158[a]	− 1,295[b]	− 6,155[a]	0.0009[a]	0.0002
	(0.000)	(0.000)	(0.039)	(0.000)	(0.000)	(0.232)
Utility	0.0018[b]	− 0.0231[a]	− 1,591[b]	− 11,102[a]	− 0.0001	− 0.0015[a]
	(0.024)	(0.000)	(0.017)	(0.000)	(0.154)	(0.000)
Standard deviation of stock returns	0.0158[b]	0.0910[a]	662	58,455[a]	0.0010	− 0.0009
	(0.011)	(0.000)	(0.895)	(0.000)	(0.141)	(0.408)
F value	85.87[a]	488.40[a]	4.24[a]	110.76[a]	107.47[a]	147.11[a]

[a]Statistical significance at 0.01 level.
[b]Statistical significance at 0.05 level.
[c]Statistical significance at 0.10 level.

three and four times more likely during trading windows compared to blackout periods. For purchases, trading activity is between two and three times more likely during trading windows. This asymmetry is consistent with the observation that the firm and its insiders are more likely to attract shareholder lawsuits after insider sales rather than purchases (Eth and Dicke, 1994). The univariate differences, for purchases and sales separated, comparing trading windows to blackout periods are statistically significant at the 0.01 level for all three insider trading measures. The multivariate results presented in Table 3 confirm these findings.

The parameter estimates in Tables 2 and 3 tend to be highly significant. Many *p*-values are less than 0.001. We are concerned about the possibility that the significance levels are overstated because of the panel characteristics of the data. For example, yearly measures of industry, size, market-to-book ratio, and stock return volatility tend to be relatively stable across many observations because the specifications rely on trading data recorded daily. To investigate the robustness of our results, we also calculate *p*-values based on a bootstrap methodology for all reported specifications. Specifically, we randomly draw residuals, with replacement, from the initial regression and repeat the regressions using these residuals as the dependent variable. This process is repeated 500 times for each regression, yielding empirical distributions of the coefficient estimates under the null hypothesis of no systematic variation across firms. We then use the empirical distributions to assess statistical significance. Based on the bootstrap *p*-values, the results are similar to those reported in Tables 2 and 3. With only a couple of exceptions, which we note below, the results reported in Tables 4 and 5 are also robust using the bootstrapped standard errors.

The evidence presented in Fig. 2 and Tables 2 and 3 shows that trading during blackout periods is suppressed, but that some trading still occurs. One possible reason for observing trading activity during blackout periods is that insiders succumb to the profit motive and violate their own company's restrictions on trading. Another possible reason, suggested by some survey responses, is that insiders can request and sometimes obtain permission to trade during blackout periods. In follow-up discussions with the legal counsel for several firms, we found that, for some firms, insiders can trade during a blackout period if permission is obtained from the appropriate office or officer in advance. Typically, this permission comes in the form of a 'pre-clearance' letter issued by the legal counsel. When such permission is granted, it is almost always for personal liquidity or diversification reasons, and the trade must be executed within some specified time period, such as two days. When a pre-clearance letter is denied, the insider cannot trade, and in some firms the existence of the denial is considered to be inside information that cannot be disclosed. We also found that some companies never grant permission to trade during the blackout period. For the four firms we contacted that indicated that they had such inflexible or

rigid blackout periods, we detect no trading whatsoever by insiders during blackout periods in 1996 and 1997.

Finally, the findings in Tables 2 and 3 also have implications for experiments that attempt to assess insider trading activity using measures of abnormal insider transactions, or volume, or both (see e.g., Bettis and Coles, 1997; Seyhun and Bradley, 1997; Sanders and Zdanowicz, 1992). The evidence in this section shows that insiders trade much more actively during windows when trading is allowed than during periods when the firm prohibits trading by insiders. Blackout periods are imposed by more than three-quarters of the firms in our sample. When researchers constructing experiments ignore blackout periods in their model specifications, their measures of both the benchmark and abnormal levels of insider trading are likely to be contaminated. At the very least, the conventional abnormal trading measures suffer from measurement error, and the associated statistical tests are likely to suffer from low power. In addition, the transition from blackout period to trading window is likely to explain, in part, the patterns of trading observed around value-relevant corporate events. For example, Garfinkel (1997) concludes that the restrictions contained in ITSFEA largely explain the reduction in trading activity prior to earnings announcements. Our findings suggest that the existence of blackout periods prior to the earnings announcement may be partially responsible for this result.

4. Blackout periods and the bid–ask spread

The evidence in the previous section shows that blackout periods are effective and concentrate insider trading in time periods when insiders are allowed to trade. Nonetheless, we find that a fair amount of insider trading also occurs during blackout periods. To test the empirical importance of blackout periods and the differential trading rates across blackout periods and allowed trading windows, we examine the association between the bid–ask spread and whether the trading day is a blackout day. As noted by Seyhun (1986, p. 191):

> The market-maker's response to informed traders implies a positive relation between the bid–ask spread and the informed traders' abnormal profits. The bid–ask spread would be higher than otherwise, if the informed traders possess more valuable information when they trade or account for a greater proportion of the overall trading volume. In effect, the market-maker's bid–ask spread reflects his expected losses to *all* informed traders.

If the market-maker sets the spread based on the potential presence of informed traders, and information-based insider trades are made during the trading window, the spread should be narrower during blackout periods, all else being equal. On the other hand, if trades made during blackout periods are more likely to be based on private information, then spreads may be wider during the

blackout periods. Of course, another possibility is that market makers do not know when trading is blacked-out. However, all of the market makers we asked said they are aware of the existence and timing of blackout periods.

We use two measures of the spread, the effective half-spread and the realized half-spread, as well as a measure of the price impact of the trade, to explore these questions. Many trades occur at prices inside the posted quotes, implying that quoted spreads tend to overestimate actual trading costs (see e.g., Peterson and Fialkowski, 1994; Lee, 1993). Thus, to account for trades occurring inside the quotes we compute the effective half-spread as

$$\text{Effective half-spread} = 100D_{it}(P_{it} - M_{it})/M_{it}, \tag{1}$$

where P_{it} is the transaction price for security i at time t, and D_{it} is a binary indicator variable equal to one for customer buy orders and minus one for customer sell orders. M_{it} refers to the most recent quote midpoint, and is calculated as the mean of A_{it}, the posted ask price for security i at time t, and B_{it}, the posted bid price for security i at time t. The effective half-spread is an estimate of both the percentage execution cost actually paid by the trader and the gross revenue to the market-maker. We categorize trades as buys or sells using the algorithm recommended by Lee and Ready (1991). Since trades are often reported with a delay, we follow Bessembinder and Kaufman (1997) and compare trade prices to quotes in effect 20 seconds prior to the reported trade time.

Market-makers must widen spreads to compensate for losses generated by purchases and sales to better informed traders, such as corporate insiders. The price impact of informed trades, which refers to the decrease in asset value following customer sell orders and the increase in asset value following customer buy orders, reflects the market's assessment of the private information that these trades convey. Such price moves constitute a market-making cost. Price impact measures the amount by which the trade moves the price, and reflects the adverse selection component of the spread. Price impact is defined as

$$\text{Price impact} = 100D_{it}(P_{it+n} - M_{it})/M_{it}, \tag{2}$$

where P_{it+n} is the first trade price observed at least 24 hours after the trade for which the spread is computed (see Bessembinder and Kaufman, 1997 for details). Finally, the realized spread is the effective spread minus the price impact. Thus, to measure the revenue to market makers net of losses to better-informed traders, we calculate the realized half-spread as

$$\text{Realized half-spread} = 100D_{it}(P_{it} - P_{it+n})/M_{it}. \tag{3}$$

We calculate firm-day means, based on all trades on a particular day, for price impact and the two spread measures using the 1996 Trade and Quote (TAQ) database from the NYSE. The TAQ database contains the trade price and trade size, as well as the time of day that the trade took place, for all trades in a given security. The TAQ data also contains the quoted bid and ask prices, and the

time that the quote was posted. We use the one year of data surrounding the survey date because we can be confident that all sample firms have the described blackout periods in place, and because one year provides a sufficiently large number of observations. Table 4 reports multivariate comparisons of the spread during blackout days and allowed trading days, where each firm-day observation is weighted by the number of trades used to compute the daily mean. We also control for other factors that have been shown to affect spreads: firm size (Stoll and Whaley, 1983), volume (Benston and Hagerman, 1974; Blume and Goldstein, 1997; Easley and O'Hara, 1992), stock price volatility (Benston and Hagerman, 1974; O'Hara, 1995), exchange (Christie and Schultz, 1994), and the inverse of the firm's stock price (Harris, 1994). Because the spread is known to widen immediately following an earnings announcement (Lee et al., 1993), we also include an indicator variable equal to one for the day of and two trading days immediately following the earnings announcement day. Our control variables should account for the cross-sectional variation in spreads associated with important firm-specific characteristics, thereby allowing us to isolate the effects of insider trading policies.

The first specification in Table 4 shows that the effective half-spread is smaller during blackout days. The blackout day estimate is -0.022 ($p = 0.000$), indicating that blackout day restrictions reduce the spread by about two basis points. Our blackout day estimate of the price impact is -0.027 ($p = 0.000$), suggesting that the decrease in the effective spread is predominantly due to a smaller adverse selection component of the spread. Consistent with this conjecture, the realized half spread, which represents profits to the market maker after losses to informed traders, does not depend on whether trading is allowed. Some caution in interpreting these results is justified. Based on the bootstrap p-values, the results are essentially identical to those reported in Table 4, with the exception that the p-value on the blackout day indicator for the price impact equation is not significant ($p = 0.153$). The reason is likely to be that price impact is a very noisy measure compared to the effective spread. This prediction is reflected in the poor regression fit relative to the specification based on the effective half-spread as the dependent variable. All other inferences based on the bootstrap procedure are similar to those reported.

Although two basis points appears to be small in absolute terms, to assess the economic significance of the size of the reductions in the spread we compute the ratio of the value of the coefficient on the blackout day indicator to the sample average of the corresponding spread measure for firms that have blackout periods in place. Based on these measures, the effective spread is reduced by 8.5% on blackout days, and the price impact of a trade is reduced by 10.7%.

To examine the overall differences in spreads relative to firms that do not have company policies on insider trading, Table 4 also reports regressions that do not include the indicator for blackout days. The results indicate that companies that have insider trading policies that do not include blackout periods have an

Table 4
Effects of defined blackout periods on bid–ask spreads

Weighted least-squares regressions of percentage spread and price impact measures on an indicator variable equal to one if the day is a blackout day and equal to zero if the day is an allowed trading day, the log of market capitalization from CRSP, the log of daily share volume from CRSP, the inverse of the average intraday trade price measured from bid–ask midpoints, the standard deviation of intraday price measured from bid–ask midpoints, an indicator variable equal to one for NASDAQ firms and zero otherwise, and an indicator variable equal to one for the day of and two days following earnings announcements and zero otherwise. The spread measures are calculated as daily averages based on trades for each firm day and the weights used in the regressions are the number of observations used to compute each firm-day average. The sample consists of 284 firms with blackout periods and 119 firms without blackout periods from January 1 to December 31 of 1996 comprising 82,872 firm-day observations. *p*-values are in parentheses[c].

Independent variables	Dependent variables					
	Effective half-spread		Price impact		Realized half-spread	
Intercept	0.547[a]	0.551[a]	0.513[a]	0.518[a]	0.138[a]	0.136[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Indicator for trading policy but no blackout period	− 0.008[a]	− 0.009[a]	− 0.016	− 0.017	0.003	0.003
	(0.005)	(0.002)	(0.320)	(0.280)	(0.853)	(0.837)
Indicator for trading policy with blackout period(s)	0.021[a]	0.006[a]	0.003	− 0.016	0.016	0.021
	(0.000)	(0.017)	(0.832)	(0.289)	(0.300)	(0.169)
Indicator for blackout day	− 0.022[a]	—	− 0.027[a]	—	0.006	—
	(0.000)		(0.000)		(0.361)	
Log of market capitalization	− 0.028[a]	− 0.030[a]	− 0.060[a]	− 0.062[a]	0.028[a]	0.029[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Log of daily share volume	−0.007[b]	−0.005[a]	0.032[a]	0.034[a]	−0.041[a]	−0.042[a]
	(0.012)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Inverse of average intraday trade price	5.396[a]	5.364[a]	2.703[a]	2.664[a]	3.863[a]	3.872[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Intraday standard deviation of price	0.115[a]	0.115[a]	0.377[a]	0.378[a]	−0.260[a]	−0.261[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Indicator for NASDAQ firms	0.197[a]	0.193[a]	0.132[a]	0.126[a]	0.087[a]	0.089[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Indicator for day of and two days following	0.019[a]	0.013[a]	−0.104[a]	−0.113[a]	0.133[a]	0.135[a]
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
F value	30973.7[a]	34660.5[a]	849.0[a]	952.9[a]	658.1[a]	740.2[a]

[a]Statistical significance at 0.01 level.
[b]Statistical significance at 0.05 level.
[c]Statistical significance at 0.10 level.

effective spread that is 0.9 basis points ($p = 0.002$) lower and a price impact that is 1.7 basis points ($p = 0.320$) lower compared to firms with no trading policies. For firms that use blackout periods, the effective spread is 0.6 basis points ($p = 0.017$) larger and the price impact is 1.6 basis points ($p = 0.289$) lower relative to firms without trading policies.

Overall, the evidence suggests that blackout periods are associated with a modest reduction in the adverse selection component of the spread. Further, the evidence suggests that market makers widen the spread during trading windows just enough to offset increased information-based losses related to the concentration of insider trading in these time periods. Furthermore, while we cannot observe what the magnitude of the bid–ask spread would be in the absence of blackout periods, the small differences in overall spreads across firms with different insider trading policies does not support the hypothesis that company level restrictions on insider trading reduce liquidity for the firm's shares.

5. Blackout periods, profitability of insider trades, and market liquidity

The reduction in the bid–ask spread during blackout days is consistent with the hypothesis that the market maker faces a smaller adverse selection problem in these time periods. In Section 3 we showed that the market maker has a lower probability of trading against an insider during blackout periods. In this section, we examine whether blackout periods are also associated with differences in the profitability of insider trades.

To assess potential losses to the market maker from trading against an insider we measure one-week cumulative abnormal returns accruing to insiders. Our one-week measure is based on five trading days. The one-week horizon is employed because we are primarily interested in the losses of market makers, who should be able to adjust their inventory to the desired level over a relatively short time period. The benchmark is a set of 25 passive characteristic portfolios formed on quintiles of the ratio of book-to-market equity, and firm size. The book-to-market ratio and size portfolios are motivated by the work of Fama and French (1992), who find that these factors explain differences in average returns. Characteristic portfolios similar to these also have been used by Daniel et al. (1997) to evaluate the performance of mutual fund managers. The evidence of Rozeff and Zaman (1998), who show that insiders tend to purchase high book-to-market value stocks and sell low book-to-market glamour stocks, suggests that it is important to use a benchmark that controls for book-to-market and size.

The portfolios are formed in a manner similar to that described in Fama and French (1992). Specifically, we calculate the book-to-market ratio for all firms on Compustat, using the book value of equity for the last month in the prior

fiscal year and the market value of equity for December. Size, measured as the market value of equity, is then calculated in June of the following year, which we refer to as the formation year. In each formation year, firms are sorted into quintiles of size and book-to-market ratios based on quintile breakpoints for NYSE firms. Firms are placed into quintiles using unconditional sorting rules. We then calculate value-weighted daily returns for the firms in each of the 25 portfolios beginning in July of the formation year and ending in June of the following year. We measure abnormal profits by weighting the relevant benchmark-adjusted return by the dollar-volume of the transaction. We treat purchases and sales separately and aggregate multiple trades that occur on the same day within the same firm into a single trading event. The abnormal returns following insider sales are multiplied by negative one. We include the 284 firms with blackout periods and the 119 firms without blackout periods. The sample period is January 1996 through December 1996 to be concurrent with our analysis of the bid–ask spread. Results from the entire sample period are qualitatively similar.

Table 5 reports the results of regressing the one-week cumulative abnormal returns, weighted dollar volume, for sales, purchases, and all trades on several indicator variables. All specifications include an indicator for companies with policies that do not include blackout periods, and an indicator for whether the policy specifies a blackout period. To determine whether insiders in firms with blackout periods earn lower profits on allowed trading days or blackout days, we include an indicator variable for blackout days. This variable is zero unless the trading day is a blackout day, which can only occur for a firm with a policy that specifies a blackout period. In addition, some model specifications also include control variables to account for differences in profitability that may be correlated with the use of insider trading policies. The control variables include firm size, the market-to-book ratio, the standard deviation of stock returns, and indicator variables equal to one if the firm is a bank or thrift (SIC codes 6000–6999) or a utility (SIC codes 4900–4939).

Model 1 shows that insiders in firms with no trading policies earn abnormal profits that are not significantly different from zero (-0.46%) over the week following insider purchases. The coefficient estimates in Model 1 indicate that insiders in firms with policies that do not include blackout periods earn abnormal profit of 0.74% (calculated as $[0.0120 - 0.0046] \times 100$) over the week following insider purchases. An F-test indicates that this rate of profit is significantly different from zero only at the 0.10 level (bootstrap $p = 0.24$). The same result is true for firms that use blackout periods. Insiders in these firms who purchase stock during allowed trading periods earn cumulative abnormal profits of 0.58% (calculated as $[0.0104 - 0.0046] \times 100$), a rate which is significantly different from zero at the 0.05 level (bootstrap $p = 0.11$). The negative coefficient on the blackout day indicator variable implies that profits following insider purchases on blackout days are 0.29% smaller than those following

Table 5
Regressions of the dollar volume weighted cumulative abnormal returns to insiders for open market purchases and sales on indicator variables for various insider trading policies

The abnormal return is cumulated over the week (five days) following the transaction and is measured relative to a benchmark portfolio based on five groups of book-to-market equity ratio and five size groups. For sales, the abnormal return is multiplied by negative one. The insider trading policy variables include an indicator equal to one if the firm has policies on insider trading, an indicator equal to one if the firm has policies that include blackout periods, and an indicator equal to one if the trade was made during a blackout day, for firms with blackout periods. The control variables include the log of total assets, the market-to-book ratio, the standard deviation of stock returns, and indicator variables that identify if the firm is a bank or thrift (SIC codes 6000–6999) or a utility (SIC codes 4900–4939). The sample consists of all open market purchases and sales by insiders in 284 firms with blackout periods and 119 firms without blackout periods from the period January 1, 1996 to December 31, 1996 which have nonmissing values of book-to-market equity and size. *p*-values are in parentheses.

Independent variables	Model 1 Purchases	Model 2 Sales	Model 3 All trades	Model 4 Purchases	Model 5 Sales	Model 6 All trades
Intercept	− 0.0046	0.0049	0.0035	0.0132	− 0.0369[a]	− 0.0401[a]
	(0.483)	(0.347)	(0.399)	(0.337)	(0.000)	(0.000)
Indicator for trading policy but no blackout period	0.0120	− 0.0052	− 0.0033	0.0057	− 0.0071	− 0.0058
	(0.119)	(0.353)	(0.472)	(0.476)	(0.199)	(0.200)
Indicator for trading policy with blackout period(s)	0.0104	0.0015	0.0028	− 0.0007	− 0.0103[b]	− 0.0087[c]
	(0.142)	(0.791)	(0.527)	(0.924)	(0.064)	(0.052)
Indicator for blackout day	− 0.0029	− 0.0149[a]	− 0.0112[a]	− 0.0078[b]	− 0.0080[a]	− 0.0054[a]
	(0.354)	(0.000)	(0.000)	(0.013)	(0.002)	(0.007)
Includes control variables	No	No	No	Yes	Yes	Yes
N	969	1,912	2,881	969	1,912	2,881
F value	1.103	13.58[a]	12.97[a]	12.59[a]	16.77[a]	12.730[a]

[a]Statistical significance at 0.01 level.
[b]Statistical significance at 0.05 level.
[c]Statistical significance at 0.10 level.

trades made during allowed trading windows, but the difference in profitability is not statistically significant.

Following sales, Model 2 demonstrates that insiders in firms with no trading policies earn abnormal profits of 0.49%, which is not significantly different from zero. In firms with trading policies that do not include blackout periods, abnormal profits following insider sales are -0.03% (calculated as $[0.0049 - 0.0052] \times 100$), which is not significantly different from zero. In firms with blackout periods, insider sales made during allowed trading days yield abnormal profits of 0.64% (calculated as $[0.0049 + 0.0015] \times 100$), which are significantly different from zero at the 0.01 level (bootstrap $p = 0.09$). Sales made during blackout periods are associated with abnormal profits that are 1.49% lower than those following sales during allowed trading periods. The difference in profitability between sales made during allowed trading windows and blackout periods is significantly different from zero at the 0.01 level (bootstrap $p = 0.02$). Model 3, which shows the effect of aggregating across purchases and sales, yields similar results.

In Models 4–6 we estimate the same specifications and include control variables. The results are similar. Most importantly for our purposes, the coefficient on the blackout day indicator remains negative, indicating that, in firms with blackout periods, the profitability of insider trades is higher during allowed trading periods than during blackout periods. The coefficients from these three models suggest that one-week abnormal profits to insiders during a blackout period is from 0.54% to 0.80% smaller than profits from trading during trading windows. All of the blackout day coefficient estimates are statistically significant based on the OLS standard errors (the largest p-value is 0.013), but only the coefficient for insider sales remains significant at the 0.10 level using the bootstrap standard errors.

The coefficients on the control variables, which are omitted from Table 5, indicate that insider trading profits following sales are increasing with firm size, the market-to-book ratio and the standard deviation of stock returns, and are lower if the firm is a bank or thrift. Insider profits following purchases are unrelated to firm size, increasing with the market-to-book ratio and the bank or thrift indicator, and decreasing with the standard deviation of stock returns.

For firms with blackout periods, the evidence shows that the one-week cumulative abnormal profitability of insider trades is higher during trading windows than during blackout periods, and that this effect tends to be largest for insider sales. These findings support the hypothesis that insiders must obtain permission to trade during blackout periods, and that this permission is granted only if the trade is liquidity motivated. Taken together with the differences in trading rates across window and blackout periods, the evidence is consistent with the reduction in the bid–ask spread during blackout days. Further, the evidence suggests that market makers face a less-severe adverse selection problem during times when insiders are restricted from trading.

6. Conclusion

This paper provides systematic evidence on policies and procedures established by corporations to restrict and manage trading by the firm's insiders in the firm's stock. Such policies are quite common. By November of 1996, 92% of our sample firms had implemented a policy and nearly 80% had explicit blackout periods during which the company prohibits trading by its insiders. The single most common of these policies disallows trading by insiders at all times except for the period 3–12 trading days after the quarterly earnings announcement.

Trading policies appear to be more than a public relations contrivance. For firms in our sample that have blackout periods, we find that insider trading is concentrated in windows during which trading is permitted. Nevertheless, some insider trading occurs during blackout periods, so either self-regulation at the company level is not perfectly effective or insiders commonly receive permission to trade inside the blackout period. The lower rate of trading during blackout periods appears to be manifested in greater liquidity for the shares of the firm. We find that the bid-ask spread shrinks about two basis points, or 8.5%, during blackout periods. In addition, the profitability of insider trades made during a blackout period is moderately lower than for trades made during allowed trading windows. Overall, the evidence suggests that corporate policies restricting insider trading are structured in such a way as to provide benefits to shareholders beyond mere legal protection of corporate insiders.

Appendix A. Examples of blackout periods

This section provides specific examples of blackout periods as described by survey respondents. Our agreement with the American Society of Corporate Secretaries, who sponsored the survey used to gather our data on blackout periods, guarantees the anonymity of the firms responding to our survey. Thus, the examples given below include only the industry in which the firm operates along with the description of the blackout period.

Industry/SIC	Blackout period or trading window
National commercial banks/6021	2-week period prior to earnings release.
Bank holding company/6712	Allows trading during a 20 trading-day window beginning 3 trading days after earnings announcements.
Misc. business services/7380	30-day trading window begins 2 days following earnings release.
Steel works and blast furnaces/3312	Trading window begins on 3rd business day following an earnings release and ends on 30th business day after such release.

Semiconductors, related devices/3674	Trading window opens 3 days following earnings announcements; closes on 15th day of middle month of a quarter. Trading window can be closed abruptly by CEO or General Counsel at any time.
Eating places/5812	Section 16 insiders may not trade for a minimum period of 48 hours, as directed by the senior vice president, general counsel and secretary, following the public release of material inside information.
Eating places/5812	Insiders cannot buy or sell beginning on the first day of the quarter through the close of trading on the second business day following the date of release of earnings information for preceding quarter.
Professional and commercial equipment and supply – wholesale/5040	Blackout periods occur during material events or known material contingencies, such as potential secondary offering, stock split, other financing, mergers and acquisitions reviews that are in confidentiality or due diligence stage prior to anticipated decisions.
Paper and paper products – wholesale/5110	Blackout period is 10 days prior to end of each quarter until 3 days after earnings announcement.
Real estate operators – lessor/6510	Trading window is open 3 to 12 days following earnings announcement for specified insiders.
Plastics products/3089	Trading is prohibited from 10 days before to 10 days after earnings announcement.
Automatic regulating controls/3822	Blackout period starts the first day of the third month in any quarter and goes to the second day after the next quarterly earnings announcement.

References

Agrawal, A., Jaffe, J., 1995. Does Section 16b deter insider trading by target managers? Journal of Financial Economics 39, 295–319.

Bainbridge, S.M., 1999. Insider trading. In: Bouckaert, B., De Geest, G. (Eds.), Encyclopedia of Law and Economics. University of California, Los Angeles, pp. 97–124.

Benston, G., Hagerman, R., 1974. Determinants of bid–ask spreads in the over the counter market. Journal of Financial Economics 1, 353–364.

Bessembinder, H., Kaufman, H., 1997. A comparison of trade execution costs for NYSE and NASDAQ listed firms. Journal of Financial and Quantitative Analysis 32, 287–310.

Bettis, J.C., Coles, J.L., 1997. New evidence on insider trading around merger announcements. Unpublished working paper. Arizona State University, Tempe.

Blume, M., Goldstein, M.A., 1997. Quotes, order flow, and price discovery. Journal of Finance 52, 221–244.

Bragg, H., 1999. Corporate policies affecting insider trading. Unpublished Honors thesis, Arizona State University, Tempe.

Christie, W., Schultz, P., 1994. Why do NASDAQ market makers avoid odd-eighth quotes? Journal of Finance 49, 1813–1840.

Daniel, K., Grinblatt, M., Titman, S., Wermers, R., 1997. Measuring mutual fund performance with characteristic-based benchmarks. Journal of Finance 52, 1035–1058.

Easley, D., O'Hara, M., 1992. Time and the process of security price adjustment. Journal of Finance 47, 577–606.

Eth, J., Dicke, M., 1994. Symposium on securities litigation reform: insider stock sales in Rule 10b-5 corporate disclosure cases: separating the innocent from the suspicious. Stanford Journal of Law, Business & Finance 1, 97–124.

Fama, E., French, K., 1992. The cross-section of expected stock returns. Journal of Finance 47, 427–465.

Garfinkel, J., 1997. New evidence on the effects of federal regulations on insider trading: the Insider Trading and Securities Fraud Enforcement Act (ITSFEA). Journal of Corporate Finance 3, 89–111.

Harris, L., 1994. Minimum price variations, discrete bid-ask spreads, and quotation sizes. Review of Financial Studies 7, 149–178.

Horowitz, R.A., Bitar, K.Y., 1998. Minimizing the Risk of Insider Trading Liability. Client Alert, July 1998, 1–3. Paul, Hastings, Janofsky and Walker LLP, New York.

Jeng, L., 1997. Insider trading and the window of opportunity. Unpublished working paper. Harvard Business School.

Lee, C., 1993. Market integration and price execution for NYSE listed securities. Journal of Finance 48, 1009–1038.

Lee, C., Mucklow, B., Ready, M., 1993. Spreads, depths, and the impact of earnings information: an intraday analysis. Review of Financial Studies 6, 345–374.

Lee, C., Ready, M., 1991. Inferring trade direction from intraday data. Journal of Finance 46, 733–746.

Meulbroek, L., 1992. An empirical analysis of illegal insider trading. Journal of Finance 47, 1661–1699.

O'Hara, M., 1995. Market Microstructure Theory. Blackwell Publishers Ltd., Cambridge, MA.

Peterson, M., Fialkowski, D., 1994. Posted versus effective spreads. Journal of Financial Economics 35, 269–292.

Rozeff, M., Zaman, M., 1998. Overreaction and insider trading: evidence from growth and value portfolios. Journal of Finance 53, 701–716.

Sanders, R.W., Zdanowicz, J.S., 1992. Target firm abnormal returns and trading volume around the initiation of change in control transactions. Journal of Financial and Quantitative Analysis 27, 109–129.

Seyhun, N.H., 1986. Insiders' profits, costs of trading, and market efficiency. Journal of Financial Economics 16, 189–212.

Seyhun, N.H., 1992. The effectiveness of the insider-trading sanctions. Journal of Law and Economics 35, 149–182.

Seyhun, N.H., Bradley, M., 1997. Corporate bankruptcy and insider trading. Journal of Business 70, 189–216.

Steinberg, M.I., Fletcher, J., 1994. Compliance programs for insider trading. Southern Methodist University Law Review 47, 1783–1835.

Stoll, H.R., Whaley, R.E., 1983. Transaction costs and the small firm effect. Journal of Financial Economics 12, 57–79.