Equity-based compensation and the timing of share repurchases: the role of the corporate calendar[*]

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Abstract

We examine whether CEOs use share repurchases to sell their equity at inflated prices. We document that share repurchases, just like equity-based compensation, are affected by the corporate calendar—the firm's schedule of earnings announcements and insider trading restrictions. The corporate calendar can fully explain why share repurchases and equity-based compensation coincide. The alignment with the corporate calendar is stricter in firms with strong internal governance or high external monitoring. When CEOs sell equity, firms are actually less likely to repurchase. Our findings reconcile earlier studies and highlight the importance of the corporate calendar for the timing of share repurchases.

Keywords: Payout policy, share repurchases, quarterly earnings announcement, equity-based compensation, insider trading, fiscal calendar

[JEL]-classification: G14, G35, M12, M41, M52

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"We give stock to corporate managers to convince them to create the kind of long-term value that benefits American companies and the workers and communities they serve. Instead, what we are seeing is that executives are using buybacks as a chance to cash out their compensation at investor expense." - SEC Commissioner Robert J. Jackson Jr, March 2019.

1. Introduction

In this paper, we examine the link between share repurchases and equity-based compensation and address the widely shared concern that CEOs use share repurchases opportunistically.[1] Systematic empirical evidence on the matter is still scarce because of a lack of granular data, but tends to support the concern: research finds that insiders (Bonaimé and Ryngaert, 2013) and specifically the CEO (Moore, 2023) are more likely to sell equity when firms buy back stock. Edmans et al. (2022) find that share repurchases boost the stock price when the CEO's equity vests, at the expense of long-term shareholder value. Yet, the merits of these concerns are still debated (e.g., Bargeron and Farrell, 2021; DeAngelo, 2022; Guest et al., 2023).

We argue that the existing empirical evidence is best understood from the perspective of the corporate calendar which we define as the firm's schedule of quarterly earnings announcements and insider trading restrictions over its fiscal year. Firms and insiders usually suspend trading when the firm is in possession of private information that is material for the firm's stock price. Empirical research has shown that trading restrictions, so-called blackout periods, usually end shortly after firms announce their earnings. We show in this paper that share repurchases and equity-based compensation coincide because both are aligned with the corporate calendar. Accounting for the corporate calendar, the positive correlations between share repurchases and equity-based compensation vanish entirely and we find that the firm

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[1]On 17 October 2019, this concern was at the center of a hearing before the U.S. House Committee on Financial Services (Hearing no. 116–58). Moreover, Appendix OA.1 provides a list of commentaries pointing at the misuse of share repurchases.

is actually less likely to repurchase shares when the CEO sells equity.

For the empirical analysis, we combine data on U.S. buyback programs extracted from SEC filings with data on equity grants, vesting dates, and insider trades. We obtain data on US buyback programs executed in the open market from the firm's quarterly reports because detailed data on U.S. buybacks is not readily available. We collect the number of shares authorized for repurchase under each buyback program, the number of shares repurchased, and the average price at which the shares were repurchased. From Equilar, we determine the dates and size of equity grants and when these grants vest. From Thomson Reuters, we obtain data on the CEO's and other insiders' trades in the company's stock. To obtain firm-specific blackout periods, we rely on the descriptive statistics in Guay et al. (2022). Our resulting firm-month panel data set covers 2,377 repurchasing firms, 6,303 buyback programs, 59,082 months with open market repurchases, and 251,642 firm months in total for the period 2006-2019.

To understand the significance of the corporate calendar for the timing of share repurchases, we start our analysis by plotting a firm's repurchase activity over the firm's fiscal calendar. Earnings are usually announced early in the second month of a fiscal quarter and many firms consider the period beforehand as a blackout period in order to avoid litigation related to insider trading. This perspective brings out a stylized, but not widely acknowledged fact about the timing of share repurchases: from the first to the second month of a fiscal quarter, repurchase volume increases by 42% on average, consistent with the notion that many firms suspend trading during blackout periods.

We also examine to what extent the granting, vesting, and selling of equity depend on the corporate calendar. We find patterns that are very similar to those documented for repurchases. The CEO's equity grants cluster in the 10 days after the earnings announcement date.[2] Granted equity normally vests on the exact same date some years or some quarters in

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[2]Daines et al. (2018) report that many firms grant options to their CEOs shortly after earnings announcements to minimize opportunism.

the future (cf., e.g., Gopalan et al., 2014). Therefore, the vesting of equity is also correlated with earnings announcements, peaking in the month when earnings are announced. Edmans et al. (2017) document that executives immediately sell some of their equity after it vests and the authors use that insight to establish vesting equity as an instrument for equity sales. We can confirm this relationship between equity vesting and CEO sales for our sample, implying that the CEO's sales of equity also peak in the second month of a fiscal quarter.

We move on to directly testing the relation between open market share repurchases and the CEO's equity-based compensation, and ask to what extent that relation is associated with the corporate calendar. We document statistically highly significant correlations between share repurchases and equity grants, and between share repurchases and vesting equity, in line with Moore (2023) and Edmans et al. (2022). However, after accounting for the firms' corporate calendar by adding fiscal-month fixed effects and the share of blackout days in a calendar month as control variables, these correlations disappear entirely. The lack of a correlation between share repurchases and vesting equity is of particular importance because earlier research has used vesting equity as an instrument for the CEO's equity sales (cf., Moore, 2023 and Edmans et al., 2022). We conclude that there is no evidence of a causal relationship between equity sales and share repurchases as soon as we take the corporate calendar into account.

In further analyses, we look at firms that are more likely to be plagued by agency problems and show that, also for these firms, the corporate calendar can fully explain why share repurchases and equity-based compensation coincide. Moreover, we discover that the "corporate calendar effect" is actually most pronounced in firms with strong internal governance or high external monitoring. Hence, share repurchases and vesting equity mostly coincide when firms are less likely to grant their CEO a lot of freedom to time repurchases. Overall, these results support the notion that share repurchases coincide with equity-based compensation when both are aligned with the corporate calendar.

We perform additional analyses to alleviate endogeneity concerns. Bagnoli et al. (2002)

and DeHaan et al. (2015) have documented that earnings announcements can be strategically postponed or delayed. To rule out that our measure of blackout periods is a bad control because it absorbs some of the effect that should be captured in our compensation variables, we re-run all our regressions using the blackout period of the same quarter three years earlier. All of our findings hold. Furthermore, we show that the correlation between share repurchases and equity-based compensation is substantially lower when the earnings announcement is actually delayed. Overall, we find no indication that the "corporate calendar effect" is driven by strategic timing of the earnings announcement.

If CEOs use share repurchases to sell their equity at higher prices, we should observe relatively more share repurchases when CEOs actually sell equity. However, we do not observe any such pattern in the data. We find that firms are in fact less likely to repurchase shares when the CEO sells equity. Accounting for the corporate calendar even strengthens this finding. While we acknowledge that these results cannot be interpreted causally, they can certainly not be interpreted as evidence that the CEO trades against the firm.

Earlier research documents a negative correlation between share repurchases and net insider trading and our results are not in contradiction with this research. In line with Bonaimé and Ryngaert (2013), we find that share repurchases and net insider trading are negatively correlated, i.e., insiders sell more when firms buy back shares. Further analyses reveal that this correlation is not driven by the firm's executives (who actually trade in the same direction as the firm) but by large blockholders: large blockholders are also classified as insiders and they sell more when firms buy back stock. This finding is consistent with the results in Hillert et al. (2016) and Busch and Obernberger (2017) that firms provide liquidity when large blockholders sell their shares in order to provide price support at fundamental values.

As a final step, we analyze the shareholder-value consequences of share repurchases that coincide with the CEO's equity-based compensation. Specifically, we examine whether these share repurchases temporarily inflate the stock price. In this analysis, the corporate calendar

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does not play a direct role, but the results may allow us to further support the corporate calendar view if we observe a positive long-run performance of share repurchases linked to equity-based compensation, in line with the performance generally observed for share repurchases (cf., e.g., Peyer and Vermaelen, 2009, Dittmar and Field, 2015).

First, we study share repurchases in the open market and identify the repurchases that coincide with the vesting or selling of equity. We find that these share repurchases are executed at prices below contemporaneous market prices and are followed by positive abnormal returns. If firms would overpay for repurchased shares in order to bid up the stock price, we should find the opposite results. Second, we take a broader perspective and examine the overall performance of buyback programs that coincide with CEO equity sales. If CEOs sell equity at some point within the first 12 months of a buyback program, then the buyback program is followed by positive abnormal returns over the subsequent 48 months, even outperforming the average buyback program. This result is very difficult to reconcile with the notion of short-termism. Taken together, our results do not lend support to the claim that CEOs' incentives to boost stock prices in the short term would come at the expense of long-run shareholder value.

Earlier studies have also shown that CEOs sell more shares shortly after buyback announcements than before (see, e.g., Jackson Jr, 2019, and Edmans et al., 2022). We find that CEOs sell equal amounts of shares before and after buyback announcements when buyback announcements are not preceded by blackout periods. Moreover, we document that the firm is more likely to initiate a program when CEOs buy equity. This finding is consistent with Cziraki et al. (2019) who document a similar trading pattern for insiders in general. Overall, the evidence is most consistent with the notion that CEOs are more inclined to initiate a buyback program when they believe that the stock is undervalued.

In conclusion, we make several contributions to the literature, which, taken together, challenge the perception that equity-based compensation has a causal impact on the timing of share repurchases with negative implications for shareholder value. First, we highlight the

relevance of the corporate calendar for the timing of share repurchases. Share repurchases turn out to be much more affected by regulatory and institutional constraints than what is the general perception in the literature. As a consequence, any study of repurchase activity potentially suffers from omitted variable bias if the variable of interest is also correlated with the corporate calendar. For example, a low repurchase frequency may not so much be a measure of the firm's strive to time the market, but of the relatively long duration of its blackout periods. Second, we highlight that the corporate calendar is able to explain the correlation between share repurchases and equity-based compensation. The corporate calendar view, therefore, questions the causal interpretation of the correlation between share repurchases and vesting equity reported in Edmans et al. (2022) and Moore (2023)—in particular because we find that the reported correlations are mostly present in firms that are less likely to grant their CEO a lot of freedom to time share repurchases opportunistically. Third, we reconcile the literature on insider trading around share repurchases which has produced conflicting results: some studies show that insiders buy when firms announce buyback programs (Lee et al., 1992, Babenko et al., 2012, and Cziraki et al., 2019), whereas other studies show that insiders sell more shares after buyback announcements (Jackson Jr, 2019, and Edmans et al., 2022) and when the firm actually buys back shares in the open market (Bonaimé and Ryngaert, 2013). We find that CEOs' equity sales do not increase in months with buyback announcements, but are merely postponed to after the end of the blackout period because of trading restrictions. Overall, we show that institutional investors trade against the firm, presumably because repurchases provide liquidity, while the CEO refrains from selling equity when the firm buys back stock in the open market. Hence, the CEO trades alongside the firm, even when firms repurchase shares in the open market.

We also contribute to the ongoing discussion of tighter regulation of buybacks. We show that the alleged evidence of opportunistic timing of share repurchases by the CEO can be explained by the firm's corporate calendar and that share repurchases that coincide with equity-based compensation are associated with positive long-run abnormal returns.

Notably, the correlation appears to be driven by those firms that implement stricter rules for insider trading. Therefore, regulators may find the results useful in better understanding the potential costs and benefits of constraining repurchase behavior. See Section 6 for a more detailed discussion and suggestions.

2. Related literature

The literature on the relationship between share repurchases and equity-based compensation has focused on three different compensation-related events: equity grants, equity vesting, and sales of equity. Babenko (2009) finds that firms award fewer stock options and restricted stock after repurchases. The author argues that share repurchases increase the pay-performance sensitivity of the equity grants: a higher pay-performance sensitivity would allow firms to issue lower equity grants in the future while maintaining the same level of incentives. Kahle (2002) shows that firms announce repurchases when executives have large numbers of options outstanding and when employees have large numbers of options currently exercisable. Her results are consistent with managers repurchasing both to maximize their own wealth and to counter dilution from employee stock option exercises. Bens et al. (2003) find that executives use share repurchases to counter the dilutive effect of outstanding employee stock options on earnings per share. The dilution channel has been recently confirmed in Bonaimé et al. (2020).

Moore (2023) uses equity vesting schedules to predict the CEO's sales of equity. The author finds that predicted CEO sales are positively related to the probability and size of share repurchases, concluding that the CEO's equity-based compensation motivates share repurchases. However, the author does not find any impact of the opportunistic timing on long-term shareholder value. Edmans et al. (2022) show that firms buy back more stock when their CEOs' equity vest. Contrary to Moore (2023), the authors find that stock returns are more positively correlated with equity vesting in the two quarters surrounding vesting, but more negative in the two years thereafter. Edmans et al. (2022) also document that CEOs

sell more stock in the weeks after the buyback announcements than in the weeks before the buyback announcement. Overall, these papers argue that equity-based compensation creates short-term incentives to use share repurchases opportunistically.

Bonaimé and Ryngaert (2013) find that the probability of repurchases is highest in quarters with net insider selling. The authors conclude that share repurchases that coincide with insider selling are more likely done to support share prices or to avoid dilution, and are less likely motivated by undervaluation. Babenko et al. (2012) find that insider purchases ahead of buyback announcements are positively related to buyback announcement returns and post-announcement stock returns. Lee et al., 1992 and Cziraki et al. (2019) document that insiders buy more stock than they sell prior to buyback announcements, which suggests that insiders and the firm share a consistent valuation of the firm's current market value.

To briefly review the more general literature on repurchases, several papers document a positive relation between buyback announcements and long-term shareholder value (cf, e.g., Ikenberry et al., 1995, Peyer and Vermaelen, 2009, Lee et al., 2020), between open market share repurchases and shareholder value (Ben-Rephael et al., 2014, Dittmar and Field, 2015), and between open market share repurchases and price efficiency (Busch and Obernberger, 2017). Almeida et al. (2016) show that repurchases undertaken to meet earnings per share forecasts reduce employment, investment, and cash holdings, but these repurchases have no measurable impact on shareholder value. Bargeron and Farrell (2021) use the setting of dual-class shares to show that repurchases have a temporary price impact, but the authors argue that the price impact would be too small for CEOs to benefit from it.[3]

3. Regulation of share repurchases, equity grants, and insider trading

3.1. U.S. regulation of share repurchase programs and open-market share repurchases

The decision to initiate a buyback program concerns the firm's capital structure and payout policies and will usually be made on the executive level, with the implicit or explicit

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[3]For a recent and comprehensive review of the literature, see Bonaimé and Kahle (2022).

involvement of the CEO. The firm's board of directors has to officially authorize a program before it can start. There is generally no requirement to obtain approval from shareholders at the shareholders' meeting. Below, we discuss the regulations and rules regarding the disclosure and execution of repurchase programs.

3.1.1. Disclosure of share repurchase programs and repurchase activity

There are no specific rules or regulations regarding the announcement of newly authorized buyback programs. Firms are generally required to disclose all material information as soon as possible. Buyback programs are usually considered material information because they affect shareholders (higher payout) and debtholders (potentially higher probability of default) alike.[4] The decision to launch a buyback program is therefore usually communicated to the public via SEC's 8-K filings.

Item 703 of Regulation S-K (17 CFR § 229.703) requires firms to provide information about its repurchase activity retrospectively in its quarterly reports (via SEC's 10-Q or 10-K). For each month covered by the report, firms must report (a) the total number of shares purchased, (b) the average price paid per share, (c) the total number of shares purchased as part of publicly announced programs, and (d) the maximum number of shares that may yet be purchased under these programs. Firms must also disclose the type of transaction (open market repurchase, tender offer, privately negotiated repurchase, or accelerated share repurchase) and whether the purchase was made to satisfy the firms' obligations to provide shares to their employees as part of their compensation and pension schemes.[5] For each publicly announced program, firms must further disclose the program's date of announcement, the approved dollar value of the program, and the expiration date (if any).

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[4]For example, the NYSE mentions buyback program starts as material information: https://www.nyse.com/publicdocs/nyse/regulation/nyse/NYSE_2020_Listed_Company_Compliance _Guidance_Memo.pdf

[5]The SEC rule provides a template for the repurchase table and clarifies the information to be disclosed in the footnote to the table: https://www.govinfo.gov/app/details/CFR-2008-title17-vol2/CFR-2008-title17-vol2-sec229-703.

3.1.2. Regulation of share repurchases in the open market

The firm's trading in its own stock is subject to SEC rules 10b-5 and 10b-5-1, which state that it is unlawful to employ "manipulative or deceptive devices" (17 CFR § 240.10b-5) and to trade on the basis of material non-public information (17 CFR § 240.10b-5-1). As such, firms are liable for any damages caused by manipulation or insider trading.

SEC rule 10b-18 (17 CFR § 240.10b-18) provides a safe harbor from liability for manipulation with respect to the manner, timing, price, and volume of repurchases, provided they adhere to a number of conditions. Most notably, repurchases are exempt from anti-manipulation provisions if the firm (1) uses only one broker per trading day, (2) refrains from trading at the beginning and at the end of the trading day, (3) purchases stock at prices lower than the highest independent bid, and (4) purchases less than 25 percent of the average daily trading volume.

SEC rule 10b5-1 exempts repurchases from prosecution for insider trading if repurchases follow a pre-defined, written plan that either specifies the amounts, dates, and prices at which trading should take place, or executes a pre-defined trading formula. Bonaimé et al. (2020) find that the announcement of a 10b5-1 program leads to a significantly positive abnormal return for the firm's stock. Our sample includes 10b5-1 programs.

3.2. U.S. regulation of equity grants, vesting periods, and insider trading

To overcome the agency problems stemming from the separation of ownership and control in publicly traded firms, executives are usually compensated by equity grants of the firm they manage. Generally, the compensation committee (a subcommittee of the board of directors) determines executive compensation. Equity awards may or may not require board approval, depending on how much authority the board delegates to the compensation committee. Since 2003, the New York Stock Exchange (NYSE) and the NASDAQ Stock Exchange have accepted new rules which ask for shareholder approval of stock option plans and other types of equity compensation. Since 2006, a detailed description of executive compensation packages has to be disclosed in the annual meeting's proxy statement, including the executives' equity

grants and the vesting schedule of any equity grants (DEF 14a).

The firm's executives, together with directors and any owners of more than 10% of the firm's shares, are commonly defined as insiders.[6] Insider trades must be filed to the SEC within two business days by filling in the SEC Form 4. Moreover, each executive may have a personal 10b5-1 plan and these personal plans are seen as controversial. For a detailed discussion of 10b5-1 trading plans and their use by insiders, see Jagolinzer (2009).

4. Data and methodology

To date, there is no commercial database that provides detailed repurchase activity on a monthly basis or includes details on the nature of the repurchases. Therefore, we obtain the repurchase data directly from the quarterly filings with the SEC. We provide a detailed step-by-step description of this process in the Online Appendix OA.2. Our repurchase data set, obtained from SEC's EDGAR system, covers all firms available in CRSP that conducted at least one share repurchase in the sample period. In line with earlier literature (cf., e.g., Billett and Xue, 2007, Bonaimé and Ryngaert, 2013, Edmans et al., 2017, Almeida et al., 2016, Moore, 2023), we exclude firms in financial services and utilities from the sample. The literature has excluded these industries because of being subject to severe regulatory restrictions (financial services) and the businesses' not-for-profit nature (utilities). In the final step, we remove all observations for which at least one of our control variables is missing. Our final dataset contains 2,377 repurchasing firms, 6,303 buyback programs, 59,082 open market repurchasing months, and 251,642 firm months in total over the period 2006 to 2019. The sample begins in 2006 because the 2006 disclosure requirement for executive compensation allows to estimate vesting equity with precision.

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[6]The SEC definition of insider trading does not provide a complete list of people who need to file. The SEC's definition is "Illegal insider trading refers generally to buying or selling a security, in breach of a fiduciary duty or other relationship of trust and confidence, on the basis of material, non-public information about the security". See https://www.investor.gov/introduction-investing/investing-basics/glossary/insider-trading.

4.1. Variables

The dependent variable in our baseline regression is *Repurchase intensity*, which is constructed as the monthly number of shares repurchased in the open market under a publicly announced program during the month, divided by the number of shares outstanding at the beginning of the month, multiplied by 100.[7]

4.1.1. Equity-based compensation and insider trading

We analyze three distinct events related to the CEO's equity-based compensation: (1) the granting of equity, (2) the vesting of equity, and, finally, (3) the sale of equity. Below, we describe how we construct variables for each of these three events.

A CEO's equity compensation consists of awarded stocks and awarded options. We use Equilar to observe the grant dates and dollar amounts of the awarded stocks and options. Determining when the CEO's granted equity subsequently vests is more cumbersome, and different approaches need to be applied for stocks and options. In line with the methodology in Edmans et al. (2017) and Edmans et al. (2022), we construct *Vesting equity*, which is the dollar value of vesting equity on a monthly level.

We rely on Thomson Reuters Insider Data for detailed transaction data of firm insiders. We remove records with a cleanse indicator of "A" or "S" which indicate that the data was not verified, following Dai et al. (2016) and Rossi and Sahlström (2019). We aggregate daily data to calculate monthly measures. In line with Bonaimé and Ryngaert (2013), we construct *Insider trading* to denote the net dollar amount of insider acquisitions minus insider disposals. Furthermore, we decompose *Insider trading* into the trading activity done by each group of insiders according to their functional role, which is provided by the Thomson Reuters Insiders Data Feed Manual. Based on this categorization, we classify trading done by the CEO, CxO

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[7]Firms regularly repurchase shares outside of publicly announced programs to satisfy obligations from employee stock option plans. These buybacks are mechanically related to the CEO's equity-based compensation. Hence, they are outside of the influence of the CEO and are thus not considered in this study. For a more detailed discussion of the differences between total repurchases and repurchases under a publicly announced program, see Section A.1.1 in Hillert et al. (2016). Repurchases outside of publicly announced programs constitute only a small fraction of the total number of shares repurchased (6.6%).

(all Chief Officers except for the CEO), Officers, Directors, Beneficial owners, and Affiliates.

4.1.2. Blackout periods

Most companies voluntarily impose blackout periods to restrict insider trading and avoid litigation risk. Firms have no obligation to disclose their insider trade policies, and only a small portion of firms voluntarily do so. Therefore, the blackout periods for most firms cannot be directly observed.

The literature estimates blackout periods with three main methods: survey, firm's voluntarily disclosed insider trade policy, and actual insider trading history. Based on a survey, Bettis et al. (2000) find that 78.11% of firms have blackout periods and that the most common policy allows a 10-day window for insider trading. Jagolinzer et al. (2011) collect and examine 522 insider trade policies that are voluntarily disclosed by firms, and conclude that the average blackout period includes 46 days before and one day after the earnings announcement. Furthermore, they find that 24% of insider trades happen within blackout periods. Roulstone (2003) argues that 31.6% of firms have blackout periods, based on his criteria that at least 75% of insider trades of a firm are within one month after its earnings announcements. A recent paper by Guay et al. (2022) estimates the lengths of blackout periods based on actual insider trades, and find that the median firm allows insider trades from three days after the earnings announcement until 17 to 22 days before the end of a fiscal quarter, depending on which cutoff percentile is used.

We rely on Guay et al. (2022) to compute our measure of blackout periods because the authors use the most comprehensive sample of all studies and cover a time period that is similar to ours. Hence, we define the blackout period as the period from 20 days before the end of a firm's fiscal quarter until three days after the following earnings announcement (Compustat item: RDQ date). To obtain our monthly measure, *Blackout ratio*, we compute the fraction of trading days that are blackout days within a month. We acknowledge that this variable has measurement error, leading to attenuation bias in the estimate of its coefficient. However, attenuation bias raises the hurdle for our estimated blackout ratio to

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fully account for the correlation of dependent and further independent variables, ultimately working against us.

According to our definition of blackout period, the length of a blackout period varies with the number of days it takes a firm before announcing its earnings. In our sample, the mean (median) length of a blackout period is 58 (56) days. On the monthly level, the mean (median) number of blackout days is 19 (21).

4.1.3. Control variables

Table A1 provides a detailed overview of all control variables used in the regressions. The table also provides the coefficient estimates of all control variables used in our baseline regressions.

4.2. Descriptive statistics

Table 1 provides an overview of all variables used in this paper along with their definition and data source. Table 2 presents the descriptive statistics for these variables. Our firm-level panel covers 251,642 observations. Our repurchase variables are similar to those reported in Hillert et al. (2016) and our measures of equity-based compensation are in the same order of magnitude as the corresponding measures reported in Edmans et al. (2017) and Bonaimé and Ryngaert (2013). The average *Blackout ratio* is 0.64, in line with Guay et al. (2022).

4.3. Research Design

Our analysis is based on a firm-month level panel data set using monthly observations between 2006 and 2019. Our full specification regresses a measure of repurchase activity on measures related to the CEO's equity-based compensation, standard controls, controls for the corporate calendar (*Blackout ratio* and *Fiscal month dummies*), and time and firm fixed effects:

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\begin{aligned}
Repurchases_{i,t} = \beta_1 \cdot \text{CEO-comp}_{i,t} + \delta \cdot Blackout\ ratio_{i,t} + \gamma \cdot Controls_{i,t} \\
+ \lambda_j + \eta_t + \mu_i + \epsilon_{i,t}
\end{aligned}
\tag{1}
$$

where $Repurchases_{i,t}$ measures firm i's repurchase activity in year-month t and $CEO\text{-}comp_{i,t}$ measures firm i's equity-based compensation of the CEO in year-month t (*Granted equity, Vesting equity*, or *CEO selling*). λ_j, η_t, and μ_i denote fiscal month fixed effects, calendar time fixed effects, and firm fixed effects, respectively. The standard errors are clustered at the firm level, and regressions are unweighted.

5. Results

In Section 5.1, we examine to what extent both share repurchases and the CEO's equity-based compensation depend on the corporate calendar, which we define as the firm's schedule of regular financial events such as earnings announcements and blackout periods. In Section 5.2, we examine the relationship between share repurchases and the CEO's equity-based compensation and ask to what extent that relationship can be explained by the corporate calendar. In Section 5.3, we relate equity-based compensation to the decision to initiate a buyback program. Finally, in Section 5.4, we examine how the interaction between share repurchases and equity-based compensation affects stock prices.

5.1. The corporate calendar and the timing of share repurchases

It has long been established that equity-based compensation and insider trading are aligned with the corporate calendar through earnings announcements dates and blackout periods (cf., e.g., Yermack, 1997; Bettis et al., 2000; Daines et al., 2018). In this section, we aim to establish that this is also the case for share repurchases and that the corporate calendar generates repurchase patterns that are similar to those observed for equity grants, vesting equity, and insider trades.[8] First, we expect that buyback programs are initiated when earnings are announced to alleviate concerns of opportunistic timing.[9] Firms generally

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[8]Bonaimé et al. (2020) point out that large blackout windows make it more likely that firms introduce a buyback program under rule 10b5-1. We are not aware of any other study relating buybacks to the corporate calendar in any way and there is no study showing to what extent the corporate calendar affects repurchase activity.

[9]Also, buyback programs need to be approved by the board. Vafeas (1999) and Adams et al. (2021) state that there are less than two board meetings in one quarter on average. Board meetings are likely to

follow such an approach when awarding equity: Daines et al. (2018) document that many firms grant options to their CEOs shortly after earnings announcements to minimize opportunism. Second, we expect earnings announcements to determine when the firm trades: insiders are usually prohibited from trading prior to the announcement of earnings, at which point the firm releases material information to the public. Being privy to private information, the firm's repurchases also qualify as insider trades and should thus also be suspended during blackout periods.

Our results are fully in line with these expectations. First, we find that buyback programs and equity grants are closely tied to the announcement of earnings. Figure 1, Panel A, plots the difference in calendar days between the announcement of a buyback program and the closest announcement of earnings. A large number of buyback programs are announced on the same day as the firm's earnings are announced. Panel B shows that equity grants cluster shortly after the earnings are announced. Hence, both events are not equally distributed over the corporate calendar, but instead cluster in close proximity to the announcement of earnings.[10]

Second, we find that the actual repurchase of shares by the firm and the selling of equity by the CEO are both hampered by trading restrictions. Figure 2 groups repurchase months into three categories according to how much of a month is covered by blackout days (Panel A).[11] We find that *Repurchase intensity* is more than two times larger in months with less than 25% blackout days than in months with more than 75%. This pattern is almost identical for CEO selling (Panel B).

These two aspects become also apparent when we consider the firm's repurchase activity in fiscal time. Figure 3 contains a decomposition of the firm's fiscal quarter into its three months and summarizes the within-fiscal quarter variation of share repurchases, granted

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take place ahead of the announcement of earnings. Therefore, buyback announcements may coincide with earnings announcements because both buybacks and earnings are discussed on the board level.

[10]Figure 1, Panel B was first documented in Yermack (1997). Daines et al. (2018) report that many firms grant options to their CEOs shortly after earnings announcements to minimize opportunism.

[11]See Section 4.1.2 for details on how we identify blackout days.

equity, vesting equity, and equity sales. Across all variables, we find that the activity peaks in the second month of the fiscal quarter, which usually is the month in which the earnings are announced (on average, earnings are announced 35 days after the start of the fiscal quarter of a firm). The timing of equity grants prescribes on what date in the future equity vests because the vesting date usually falls on the same day in a future year. Accordingly, we find that *Vesting equity* also peaks in the second month of the fiscal quarter. As earnings are announced early in the second month, it is also the month that contains the lowest estimated number of blackout days in our sample (first month: 29 days, second month: 7 days, third month: 22 days). Hence, *Repurchase intensity* and *CEO selling* peak in the second month, too.

Moreover, Figure 4 presents a complete fiscal year and shows that buyback program initiations and to a larger extent equity grants are more likely to fall into the first quarter of a fiscal year. Therefore, it is essential that our measures of the corporate calendar capture not only the within-fiscal quarter variation, but also the between-fiscal quarter variation.

In Table 3, we demonstrate that the patterns depicted in our figures can also be observed in a regression analysis using monthly panel data. We regress *Repurchase intensity* on *Blackout ratio* (column 2), fiscal-quarter months (column 3), fiscal-year months (column 4), and combinations of these variables (column 5). We find that all corporate calendar variables are highly predictive of *Repurchase intensity*. If the blackout period covers half of a given month, *Repurchase Intensity* will be lower by 0.073% ($=50\% \times 0.1463$), which is almost half of the average *Repurchases intensity* recorded for our sample. The fiscal-quarter month indicators in column (3) bring out the pattern observed in Figure 3: repurchases peak in the second month of the fiscal quarter. Using fiscal-year month indicators (column 4) shows that the pattern is more nuanced. Most notably, repurchase activity is highest in the third month (rather than the second month) of the first fiscal quarter because the earnings announcement of the past fiscal year is usually scheduled for later in the quarter. Column (5) suggests that using both *Blackout ratio* and fiscal-year months provides a more complete picture of the

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relationship between the corporate calendar and repurchase activity.

We document similar patterns for the CEO's equity compensation (Table A2, Panel A: equity grants, Panel B: vesting equity) and the CEO's sale of equity (Panel C). For equity grants and vesting equity, the fiscal-year months have more explanatory power than the firm's blackout ratio, whereas it is the other way around for the CEO's sale of equity. We obtain very similar results and conclusions when we transform our dependent variables into binary variables, see Table OA1.[12]

5.2. *The relationship between share repurchases and equity-based compensation: the role of the corporate calendar*

This section provides a detailed analysis of the interaction between share repurchases and the CEO's equity-based compensation. In Table 4, we examine the direct relationship between open market share repurchases and measures of the CEO's equity-based compensation. We ask to what extent the relationship is associated with the corporate calendar. The table has three panels and each panel is dedicated to one aspect of the CEO's equity-based compensation (Panel A: Equity grants, Panel B: Vesting equity, Panel C: CEO sales), In column (1) of Panel A, we regress *Repurchase intensity* on *Granted equity*, standard controls, and firm and time fixed effects. We obtain a statistically significant coefficient for *Granted equity* of 0.0036, which means that an equity grant of one million dollars increases *Repurchase intensity* by 0.0036 percentage points on average, which is equal to 2.36% of the average *Repurchase intensity* (=0.1523%, from Table 2) in our sample. In column (2), we add two controls for the corporate calendar: fiscal month-fixed effects and *Blackout ratio*.

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[12]Graham et al. (2012) analyse annual differences in executive pay and their models achieve much higher explanatory power than our models in Table A2. The differences in explanatory power can be explained by the level of granularity of the analyses. We examine the monthly timing of equity-based compensation within the year, and firm-fixed effects have naturally much less power to explain the timing of equity-based compensation on specific months of the year. To show that the differences do not arise from differences in the data or how our variables are constructed, Table A3 examines Vesting equity on the annual level. These regressions achieve much higher explanatory power than the ones in Table A2. The explanatory power of 60% in specification 3, which is the most comparable specification, is in the approximate range of Graham et al. (2012) who report 66% in specification 2 of Table 3.

As a consequence, the coefficient estimate of *Granted equity* decreases to practically zero. To check the robustness of these results, we alternatively use the natural logarithm of *Granted equity*, the number of shares granted, or a binary indicator of whether equity is granted in columns (3) to (8). The results of the even columns, accounting for the corporate calendar, are close to zero (statistically and economically). We conclude that none of our results is driven by the distributional properties of *Granted equity*.[13] We conclude that the correlation between *Repurchase intensity* and the granting of equity is driven by the corporate calendar.[14]

In Panel B, we repeat the analysis in Panel A using *Vesting equity*. In column (1), vesting equity increases *Repurchase intensity* by 0.0038 percentage points on average, which is equal to 2.50% of the average *Repurchase intensity* (=0.1523%, from Table 2) in our sample. Our coefficient estimate of *Vesting equity* is in the same order of magnitude as the coefficient estimates reported in earlier studies. Edmans et al. (2022) report a coefficient estimate of 0.0068 and Moore (2023) reports coefficient estimates in the range of 0.0020 and 0.0053. In line with our argument, the correlation between *Repurchase intensity* and *Vesting equity* disappears in column (2) as we account for the corporate calendar. Again, these results hold irrespective of how we define *Vesting equity* (compare columns 3 to 8).

The amount of vesting equity depends on the number of vesting shares and the current stock price. Consider the setting where the number of shares that vests for a CEO is equally divided over the years. Then, the within-firm variation in the dollar value of vesting equity will simply reflect changes in the stock price. To examine whether the correlations are driven by changes in the stock price or changes in the quantity of vesting shares, we additionally include the log values of the number of vesting shares in columns (5) and (6).

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[13]Using the natural logarithm of our dependent variable, *Repurchase intensity*, does not have an impact on our results either, see Table OA2. Also in Table OA3, we use either *Blackout ratio* or fiscal-year month dummies as controls for the corporate calendar. We find that each variable accounts for approximately half of the spurious correlation reported in Table 4.

[14]In Table A1, we provide a discussion of the control variables and how well they blend in with the existing literature. Our general conclusion is that most of the control variables align well with the existing literature for our sample.

We observe similar patterns for this variable and conclude that the correlations are not driven by changes in the stock price. Columns (7) and (8) furthermore show that the results also hold for *Vesting dummy*, which further simplifies the number of vesting shares into a binary structure. Hence, the correlation appears to be driven by when equity vests, rather than by how much equity vests, which corroborates the corporate calendar argument.

In Panel C, we regress *Repurchase intensity* on measures of the CEO's sale of equity. Edmans et al. (2022) and Moore (2023) have not performed such an analysis because it cannot establish causality. In the context of our paper, however, we are more interested in the direction of the relationship between share repurchases and CEO selling than in the causality of the relationship. Furthermore, such an analysis can highlight the potential bias induced by the corporate calendar. We obtain a statistically highly significant, negative relationship between share repurchases and CEO selling in column (1), which weakens if we take the natural logarithm in column (3) and entirely disappears if we resort to the number of shares in column (5) and a binary variable in column (7). However, we obtain a statistically significant, negative relationship between share repurchases and CEO sales in all cases if we account for the corporate calendar. The positive bias due to not accounting for the corporate calendar becomes statistically significant as soon as we include the natural logarithm of *Vesting equity* or use a dummy variable to account for the skewness of *Vesting equity* (see t-tests in the last line of Panel C). Overall, the results highlight that firms are actually less likely to repurchases shares when CEOs sell equity.

A valid concern is that controlling for firm fixed effects and the firm's corporate calendar may remove any meaningful variation in vesting equity. In Panel B of Table A2, we find that our extensive fixed effect structure and the variable *Blackout ratio* explain together 13.9% of the monthly variation in vesting equity. Hence, more than 86% of the monthly variation in vesting equity cannot be explained by our extensive fixed effect structure. In Table A4, we examine the relationship between vesting equity and a number of explanatory variables in the presence of our extensive fixed effects structure. We find that an additional 21.0% of the

variation in *Vesting equity* is explained by thirteen variables including CEO ownership, CEO tenure, and vesting schedule which is the yearly weighted vesting schedule of all outstanding grants. Our overall conclusion from inspection of these tables is that even in the presence of our extensive fixed effects structure, there is still substantial and economically meaningful variation in *Vesting equity* that we can expect to lead to changes in repurchase activity.

To rule out that our measure of blackout periods is a bad control because it captures some of the effects that should be captured in our compensation variables (see Angrist and Pischke, 2009, for a discussion of the bad "proxy" control problem), we re-run all our regressions using the blackout period of the same fiscal month three years ago. Table OA4 reports that all coefficient estimates remain quantitatively unchanged for this specification.

5.2.1. The role of the corporate calendar across different types of firms

While the results above do not support the notion that CEOs use share repurchases opportunistically in the average firm, we cannot rule out on the basis of Table 4 alone that such a behavior is present in the cross-section for a smaller set of firms. Specifically, proponents of the opportunistic timing hypothesis will argue that the problem is most likely to be found in a smaller set of firms with weak governance. For these firms, the proponents of opportunistic timing would expect that the correlation between share repurchases and vesting equity may be less well explained by the corporate calendar. Meanwhile, according to the corporate calendar view, the "corporate calendar effect" should be more pronounced in firms that have high internal governance standards which require that share repurchases and equity-based compensation are aligned with the corporate calendar. According to this view, we expect the corporate calendar effect to be mostly present in firms that are governed and monitored strictly.

In Table 5, we test these hypotheses by forming sub-samples based on whether the firm has strong corporate governance (no *CEO duality* or high *Board independence*) or high external monitoring (more analysts or large firm size). In Panel A, we repeat the analysis of Table 4, Panel B, for these sub-samples, excluding corporate calendar controls. We find that

for all measures, the corporate calendar effect is much more pronounced in firms with strong governance or high external monitoring. Hence, the correlation is mostly present in those firms where CEOs are unlikely to have a lot of degrees of freedom with respect to the timing of share repurchases. Moreover, the correlations are mostly statistically indistinguishable from zero when the firm is characterized by weak governance or low monitoring, which means that there is hardly any indication of opportunistic timing to begin with for these groups of firms. Panel B shows that all effects disappear as soon as we control for the corporate calendar—also for firms with weak governance or little external monitoring. Overall, these results support the notion that share repurchases coincide with equity-based compensation when both are aligned with the corporate calendar.[15]

We use the earnings announcement date to determine a firm's blackout period and we acknowledge that earnings announcements can be endogenous. Specifically, DeHaan et al. (2015) and Bagnoli et al. (2002) have documented that some firms strategically postpone or delay the earnings announcement if it contains negative information. These papers motivate us to consider the impact of a strategic delay of the earnings announcement on the correlation between share repurchases and vesting equity. We identify two distinct scenarios. First, if the purpose of the strategic delay is to disclose bad news when attention is low, then the strategic delay should disconnect buybacks and vesting equity from each other: while equity will still vest on the same date, share repurchases will take place later if share repurchases respect the blackout period. Hence, in the absence of our corporate calendar controls, we should expect a lower correlation between share repurchases and vesting equity when earnings are delayed for the purpose of minimizing attention to bad news. Second, if CEOs strategically delay the announcement of earnings so that CEOs can sell their shares into share repurchases without the interference of bad news, then share repurchases and vesting equity will fall into the blackout period. In this scenario, there is a correlation between share repurchases and

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[15]Table A5 repeats the analysis in Table 5 for *Vesting number* instead of *Vesting equity*. We observe very similar patterns and all our conclusions hold for this specification.

vesting equity, and the correlation cannot be explained by our corporate calendar controls. Subsequently, we examine whether share repurchases and vesting equity coincide more or less in firms that frequently delay the announcement of earnings and to what extent our corporate calendar controls are capable of explaining these correlations.

In Table 5, columns (9) and (10), we distinguish firms that keep the earnings announcement date relatively constant over our sample period from those firms that tend to delay earnings announcements relatively often. To this end, we compute *EA delay*, which measures the delay in days between the actual earnings announcement date and the expected earnings announcement date, based on the earnings announcement date of the previous years. We then calculate the mean of this variable for each firm and split firms into two samples according to the median value of the average *EA delay.* In column (9) of Panel A, we find that the effect is much weaker and barely statistically significant for firms that tend to delay earnings announcements more frequently. This result suggests that share repurchases are less likely to coincide with vesting equity when earnings are strategically timed, consistent with the first scenario described above. In column (9) of Panel B, we furthermore show that the corporate calendar can fully account for the remaining correlation between vesting equity and share repurchases reported for firms with high *EA delay.* Hence, there is no evidence for the second scenario that firms strategically delay the earnings announcement so that CEOs can sell their shares into share repurchases without the interference of bad news. Overall, we conclude that the correlation between share repurchases and vesting equity is not driven by strategic delays of the earnings announcement.

5.2.2. Further robustness tests

In Table OA5 in the Internet Appendix, we repeat the analyses in Table 4 using yearly variables. On an annual basis, we find no correlations between share repurchases and equity-based compensation. These results further support the corporate calendar view as they indicate that annual payout through repurchases is not higher when the CEO's equity vests. Hence, within a (fiscal) year, repurchases fall in the same time periods as equity-based

compensation, but equity-based compensation is not associated with the overall level of payout.

Bonaimé et al. (2020) report that firms increasingly make use of SEC rule 10b5-1 when they buy back stock.[16] Buybacks under 10b5-1 programs should be independent from the corporate calendar, in particular blackout periods, because there is no risk of litigation. Table OA6 shows that the correlation between share repurchases and equity compensation reported in Table 4 are only present in flexible programs, but not in 10b5-1 programs, corroborating the notion that conventional buyback programs are hampered by trading restrictions directly related to the firm's corporate calendar.[17]

Finally, note that our analysis is based on open-market repurchases made under an authorized program. In Table OA7, we replicate the results of Table 4 for repurchases made to satisfy obligations from employee stock option plans that happen outside of authorized programs. We find that these repurchases are correlated with equity compensation irrespective of whether we account for the corporate calendar or not. This is consistent with our expectations as the relation between repurchases and equity-based compensation is mechanical and is not motivated by opportunistic timing. Furthermore, other studies analyzing the total number of share repurchases may also pick up the mechanical correlation between share repurchases and equity vesting, which is in our view incorrect.

5.2.3. Share repurchases and insider trading

Bonaimé and Ryngaert (2013) document a negative relationship between share repurchases and net insider trading. In order to reconcile our results reported in Table 4 with Bonaimé and Ryngaert (2013), we take a closer look at the CEO's actual trades of equity in Table 6. First, we aim to establish common ground and regress *Repurchase intensity*

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[16]We discuss the regulation of share repurchases under SEC-rule 10b5-1 in Section 3.1.2.

[17]15% (12%) of repurchase months in the most recent five (all) years of our sample are associated with SEC rule 10b5-1 (in these cases, firms have indicated that some or all repurchases may have taken place under 10b5-1; hence, this number constitutes the upper bound of repurchases under 10b5-1), suggesting that the corporate calendar will remain a significant factor for buyback activity for the foreseeable future.

on *Insider trading* and additional control variables used in the literature. In column (1), we find a negative relationship between share repurchases and net insider trading, which is statistically highly significant, in line with Bonaimé and Ryngaert (2013). Statistical and economic significance disappears once we control for the corporate calendar in column (2). In column (3), we split the insider trading variable into insider buying and insider selling, while keeping the corporate calendar controls in place. Insider buying turns out to have a highly significantly positive value and insider selling is insignificant. In column (4), we decompose net insider trading into trading by the CEO, the other lead executive officers (CxO), other officers, directors, beneficial owners, and affiliates. We find that only beneficial owners trade against the firm while all other insiders buy or refrain from selling shares. Beneficial owners are usually funds or trusts who hold large blocks of shares. This result is consistent with Hillert et al. (2016) and Busch and Obernberger (2017) who argue that firms provide liquidity when large blockholders sell their shares in order to provide price support at fundamental values. Finally, in column (5), we repeat the same exercise as in column (4) without the corporate calendar proxies. A comparison between columns (4) and (5) reveals whether the corporate calendar plays a role for some groups of insiders. We find that the corporate calendar plays a major role for equity sales of officers and directors. For these groups, the positive correlation between equity sales and share repurchases disappears when we account for the corporate calendar. Executives' trading seems to be mostly unrelated to the firm's buyback activity, even in the absence of corporate calendar controls. As pointed out earlier, CEOs appear to refrain from selling when the firm repurchases shares.

5.3. Buyback announcements and insider trading by the CEO

Edmans et al. (2022) and Jackson Jr (2019) note that CEOs are more likely to sell their equity shortly after the firm announces the start of a new buyback program. Bettis et al. (2000) and Klein and Maug (2020) find that executives make more insider trades after the earnings announcement because they mark the end of firms' blackout periods. We document in Figure 1, Panel A that buyback programs are often initiated at the same

time as earnings are announced. We, therefore, expect that CEOs sell more stock after buyback announcements simply because they largely coincide with earnings announcements. In line with our expectations, we find that CEOs do not sell more of their stock when buyback announcements are not preceded by blackout periods (cf., Table A6). Running a linear probability model of the initiation of a buyback program on monthly panel data, we document that the firm is not more likely to initiate a buyback program when the CEOs sell equity. However, the firm is more likely to initiate a program when CEOs buy equity, suggesting that CEOs are more inclined to initiate a buyback program when they believe that the stock is undervalued. (cf. Table A7). For a more detailed discussion of the CEO's trading around buyback announcements, we refer the reader to Section A.1 in the Appendix.

5.4. The shareholder value implications of share repurchases associated with the CEO's equity sales

In this section, we examine whether the CEO uses share repurchases to inflate the stock price above its fundamental value when she sells her equity. If buybacks move prices away from fundamental values, we should observe positive abnormal returns in the short run and a reversal of these abnormal returns (i.e., negative abnormal returns) in the long run. We estimate abnormal returns using calendar time-series regressions of equally-weighted buyback portfolios on the value-weighted market return and the risk factors "high minus low" (HML) and "small minus big" (SMB):[18]

$$R_{pt} - R_{ft} = \alpha_p + \beta_p \left(R_{mt} - R_{ft} \right) + \gamma_p SMB_t + \delta_p HML_t + \varepsilon_{pt} \tag{2}$$

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[18]We adopt this approach and its parameter choices from Peyer and Vermaelen (2009) and Dittmar and Field (2015) who both study the long-run performance of buybacks using similar data. All three factors are taken from Kenneth French's Website. Stocks do not get a higher weight in our equally-weighted portfolios if they have more than one event during the event window. To determine the ranges of portfolios based on the value or amount of vesting equity or equity sales, we use all observations with non-zero values in a given calendar year. Hence, portfolios based on quintiles will not be of equal size.

The intercept of that regression denotes the average abnormal return over the respective time period.

In Table 7, we study the performance of actual share repurchases in the open market that coincide with vesting equity, which is used as a proxy/instrument for equity sales in Edmans et al. (2022) and Moore (2023), or equity sales. In Panel A, we provide the results for our full sample of open market repurchases (N=59,082). We find that repurchases are followed by positive abnormal returns over the subsequent 12 months, consistent with the notion that share repurchases signal or exploit positive information. We do not find evidence of a positive price impact in the month of the repurchase.

In Panel B, we only consider those open market repurchases that happen in the month in which the CEO's equity vests. In total, 9,486 repurchase firm-months fall into this category. For this sample, the abnormal long-run performance is comparable to the performance of the full sample shown in Panel A. In Panel B, we also sort the repurchasing months in each year that coincide with CEO's equity vesting into three portfolios based on the dollar value of the vesting equity. These portfolios do not provide any patterns consistent with stock price manipulation or short-termism either.

In Panel C, we specifically consider those open market repurchases that happen in months in which the CEO sells her equity, which is relatively rare as only 5,869 repurchase firm-months fall into this category. The analysis in Panel C is highly endogenous, because stock returns or stock repurchases might cause CEO sales. For the event month, we document a positive and statistically significant abnormal return. Over the subsequent 12 months, we observe positive abnormal returns as well. Hence, share repurchases are associated with increases in shareholder value when CEOs sell their equity simultaneously. We do not observe a reversal pattern consistent with the notion that short-term stock returns come at the expense of long-run shareholder value. The subsamples in Panel C, which are based on the dollar amount of equity sales, reveal two interesting patterns. First, we observe that the abnormal returns in the window [0,0] increase with the amount of equity sales. Second, the

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long-run abnormal returns move towards zero from the portfolio with the lowest equity sales to the portfolio with the highest equity sales, but the returns never become negative.

To better understand these results, we compare them to how CEO sales generally perform (i.e., irrespective of whether a repurchase takes place) in Panel D. We find that CEO sales are associated with positive abnormal returns in the event month, whereas subsequent returns are not abnormally high. These results are consistent with earlier research finding that insiders usually trade contrary to the market and that insider sales have no predictive ability (cf., e.g., Lakonishok and Lee, 2001, and Jeng et al., 2003). We conclude that share repurchases that coincide with relatively large CEO sales do not contain information on average, as is normally the case with insider sales. In general, however, the long-run stock performance after CEO sales turns out to be much more positive when CEO sales coincide with share repurchases (compare Panel C with Panel D). In any case, we find no evidence that prices overshoot and then reverse.

As an additional, more granular test, we compare repurchase prices to average market prices to check whether firms buy back at a discount or at a premium when equity vests.[19] Our variable of interest, *Repurchase bargain*, is defined as the difference between the monthly average market price and the monthly average repurchase price, scaled by the average market price. In order to bid up the stock price, firms need to systematically bid above the market price or consume all liquidity in the market. Either way, repurchase prices should be at least as high as average market prices, leading to zero or negative repurchase bargains.

Our results in Table 8 document that *Repurchase bargain* is positive on average, i.e., firms buy back their stock at prices that are generally lower than average market prices. We observe this result irrespective of whether equity vests simultaneously or not (Panel A). In the month of the repurchase, the repurchase discount is equal to 0.70% for vesting months and 0.80% for all other months. Hence, the discounts reported for both groups are

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[19]Dittmar and Field (2015) and Ben-Rephael et al. (2014) document that firms generally buy back at prices that are lower than average market prices.

of similar magnitude and generally do not constitute evidence of managerial timing ability. Furthermore, relative to the average market prices computed over the following six months, firms appear to be buying back at a much larger discount if the repurchase coincides with the vesting of equity. The results are very similar when we look at CEOs' sales of equity (Panel B). Here, the average bargain in the repurchase month turns out to be larger if the CEO sells equity in the same month. Hence, contemporaneous CEO sales do not negatively affect the firm's ability to buy back at a bargain. Again, we find no evidence consistent with price manipulation.

To conclude the analysis of the impact of share repurchases on shareholder value, we take a broader view in Table 9 and study the long-run returns to buyback programs from their inception to up to four years later.[20] For the full sample of 6,303 buyback announcements reported in Panel A, we find significant monthly abnormal returns for each of the first three years after the buyback announcement. Overall, we find an average abnormal return of 0.22% over the 48 months following the buyback announcement. The average monthly returns translate into cumulative abnormal returns of 10.7% for the whole 48-month period (1-12 months: 3.5%, 13-24 3.0%, 25-36: 1.9%, and 37-48: 2.3%) by multiplying the number of months by the average abnormal monthly return over the respective time period. Thus, we document that the initiation of buyback programs is generally followed by positive abnormal returns, in line with the results in Lee et al. (2020) who also look at a recent time period.

In Table 9, Panel B, we consider only those buyback programs where the CEO sells some or all of her vested equity within the first 12 months of the program. Hence, the event window spans over a time period during which both the firm and the CEO have actually traded in the open market. We do not record any sale of the CEO's equity for 62% of buyback programs, which might be because the CEO thinks that the stock is currently undervalued or

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[20]A well-established phenomenon in the buyback literature is the "buyback anomaly", which documents that the market's reaction to buyback announcements is too small and that buyback announcements are followed by positive abnormal returns for at least the following 48 months (cf. e.g., Peyer and Vermaelen, 2009).

because the firm prohibits simultaneous sales of equity. Overall, we find that these buyback programs perform much better over the subsequent 48 months than the average buyback program (cumulative average abnormal returns of 15.1% versus 10.7%) and we observe the strongest effects for the subsample with the largest sales of equity by the CEO. In conclusion, we do not find any evidence that buyback programs are associated with negative long-run returns if CEOs sell equity within the first twelve months of the buyback program.

Overall, the results presented in this section are consistent with earlier research suggesting that firms time their repurchases well and buy back at relatively low prices. These results generally hold for the subsamples of repurchases that coincide with the vesting or sale of the CEO's equity. Hence, we find no evidence for the notion that the CEO uses share repurchases to inflate the stock price above its fundamental value when she sells her equity.

5.5. A discussion of the long-run performance results in Edmans et al. (2022)

Edmans et al. (2022) argue that CEOs boost short-term stock prices at the expense of long-term shareholder value by showing that the dollar value of vesting equity and subsequent abnormal returns are negatively correlated when firms buy back stock in the same month (cf. Table 3, Panel A, in their paper). We replicate the analysis in Edmans et al. (2022) and find similar results (cf., Panel A in Table OA8). How can we reconcile these results with our results in Table 7, Panel B, suggesting that share repurchases unambiguously create shareholder value when the CEO's equity vests? We subsequently highlight how the analyses differ from each other.

First, Edmans et al. (2022) compute buy-and-hold abnormal returns, whereas we compute abnormal calendar-time portfolio returns. We rely on this approach because it is well established in the buyback literature (cf., e.g., Peyer and Vermaelen, 2009, and Dittmar and Field, 2015). In Table A8, we show that long-run buy and hold abnormal returns are generally positive when firms buy back shares and equity vests simultaneously, which is consistent with our results in Table 7. Hence, this design choice cannot explain the differences in results. Moreover, both approaches lead to the same conclusion that share repurchases

generally create shareholder value when the CEO's equity vests at the same time.

Second, Edmans et al. (2022) run a regression of buy and hold abnormal returns on *Vesting equity*, whereas we form portfolios based on the dollar amount of *Vesting equity*. The authors document a negative correlation between share repurchases and vesting equity, but this finding alone is not sufficient evidence that share repurchases have destroyed shareholder value when equity vests. In Table A8, we also form three portfolios based on the value of *Vesting equity*. We find that abnormal long-run returns are highest in the lowest tercile, which is consistent with the results in Edmans et al. (2022). However, important to note here is that all portfolios generate positive abnormal returns. Hence, even though there is a negative correlation between *Vesting equity* and subsequent buy and hold abnormal returns, all portfolios create shareholder value.

Third, the setup of Edmans et al. (2022) may create a mechanical correlation between buy and hold abnormal returns and *Vesting equity* because *Vesting equity* reflects both the number of vesting shares and the current stock price. Especially, in the most extreme scenario where the number of vesting shares stays constant, this setup basically regresses abnormal changes in the stock price on stock prices itself. Table OA8 suggests that the results in Edmans et al. (2022) are indeed largely driven by changes in the stock price, and not by the timing or quantity of vesting equity. In Panel B, we show that the return patterns around vesting equity are even more pronounced when the firm does not repurchase shares. Hence, the reversal pattern observed by Edmans et al. (2022) is also present in the absence of share repurchases and, if anything, share repurchases mitigate the reversal pattern. Subsequently, we change the measurement of vesting equity so that the current price of the stock no longer plays a role. We observe that the return patterns actually disappear when we use a dummy variable for vesting equity (Panel C) and even reverse when we use the number of vesting shares (Panel D).

In conclusion, we find that Edmans et al. (2022) do not establish that share repurchases induced by *Vesting equity* lead to a destruction of shareholder value. The negative relation-

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ship between *Vesting equity* and subsequent buy and hold abnormal returns is not sufficient evidence in this regard. More importantly, irrespective of methodological choices, we show that share repurchases create shareholder value when the CEO's equity vests simultaneously. Moreover, our analysis in Table OA8 suggests that the observed negative correlation is mechanical because variables on both sides of the equation measure changes in the stock price. We find no evidence that would allow us to conclude that short-term concerns "induce CEOs to boost current returns at the expense of long-run value".

6. Conclusion and areas of further research

In this paper, we highlight the role of the corporate calendar in the timing of share repurchases and show that the corporate calendar can fully explain the positive correlations between share repurchases and the CEO's equity-based compensation. Our analyses furthermore reveal that the trading of the firm and the CEO are consistent: the firm is less likely to repurchase shares when the CEO sells equity and the firm is more likely to announce a buyback program when the CEO buys equity. Our findings reconcile earlier studies of the (opportunistic) timing of share repurchases and its consequences for shareholder value and highlight the first-order importance of the corporate calendar for existing and future research on share repurchases.

In light of the results of this study, we find that additional regulation of share repurchases may come at a significant cost for the U.S. capital market. Specifically, we would like to draw attention to the potential negative consequences of further confining the trading periods of the CEO and the firm by, for example, imposing separate trading periods for the firm and the CEO. Further reducing the trading window may constrain the firm's ability to provide stock liquidity when needed, and it may increase the temporary price impact of share repurchases as firms will have to buy back the same amount in shorter periods of time.

We would like to suggest one subject for further research. Establishing 10b5-1 repurchase plans as the default option for executing buyback programs may extend trading periods and

alleviate concerns of price manipulation at the same time. An interesting question in this context is why firms have not yet adapted 10b5-1 programs more widely.

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A Appendix

A.1 Buyback announcements and insider trading by the CEO

Edmans et al. (2022) and Jackson Jr (2019) note that CEOs are more likely to sell their equity shortly after the firm announces the start of a new buyback program. This observation gives rise to the concern that CEOs announce new buyback programs for the sole purpose of selling their shares amidst the positive market reaction to the announcement.[21] In this section, we examine the merits of this concern.

In Table A6, we examine differences in sales of equity between ten days before and ten days after the announcement of buyback programs. We find that CEOs indeed sell more equity after buyback announcements. Meanwhile, the number of blackout days turns out to be much larger before the buyback announcement. Hence, CEOs are much less restrained in their trading after the buyback announcement. A similar, but even more pronounced picture emerges when we perform the same analysis around earnings announcements. Moreover, if we perform the same analysis for those buyback announcements that do not have blackout days within the event period, we are no longer able to document differences in trading between the pre- and post-period. We conclude that the differences in CEO selling around buyback announcements are due to their clustering around earnings announcements, which confines many CEOs to trading after the buyback announcement.

In order to obtain a comprehensive picture of the relationship between buyback announcements and the CEO's equity sales, we use a linear probability model of *Program initiation* on the CEO's trading, and control variables. The results are presented in Table A7. We find that the probability of launching a buyback program increases when the CEO buys equity in the company: if the CEO buys stock worth one million dollars, the firm is four times more likely to initiate a buyback program.[22] This result suggests that the CEO tends to initiate a buyback program when she believes that the stock is currently undervalued. There

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[21]A related concern is that the CEO opportunistically sells her equity after a regular buyback announcement (as opposed to opportunistically timing the buyback announcement to precede planned equity sales). However, such opportunistic behaviour would not affect the timing of share repurchases. Moreover, the CEO would trade on public information of a payout policy decision that is deemed sensible by the market. Nevertheless, note that we implicitly examine this concern in the subsequent analysis, too.

[22]The probability of launching a buyback program has an unconditional mean of 6,303/251,642 = 0.025.

is only one significant correlation between CEO selling and buyback announcements, which is again entirely absorbed by the corporate calendar controls. All results hold irrespective of the distributional properties of our variables of the CEO's insider trading (cf. columns 3 to 6).

In conclusion, we again find that the empirical evidence is best understood from the perspective of the corporate calendar. CEOs appear to postpone some of their equity sales to after the buyback announcements because the period beforehand is a blackout period. Equity sales are at best marginally elevated in buyback months and this finding can again be fully accounted for by the corporate calendar.

Table A1

Overview of the standard control variables in our regressions of *Repurchase intensity*. This table provides an overview of the control variables included in our baseline regression. The coefficient estimates reported in column Our results are taken from regression specification (2) in Table 4, Panel A. The coefficient estimates are quantitatively very similar throughout all specifications in Table 4 and Table 6.

Control variable	Reason for use and references	Our results	Consistency with literature
Acquiror	Bagwell (1991) developed a theoretical model to show that repurchases may serve as a takeover defense. However, an empirical relationship between being an acquiror and share repurchases has not been established.	0.0146*	No
Assets	Various buyback papers have shown either a positive, negative, or insignificant relationship.	0.0344***	Yes
Book-to-market	Dittmar (2000) finds that firms buy back more when their book-to-market ratio is higher, which is in line with the undervaluation hypothesis for share repurchases.	0.0402***	Yes
Cash-to-assets	Stephens and Weisbach (1998) find that firms tend to repurchase more shares if they have stronger cash flows.	0.1148***	Yes
Change in short interest	Firms increase repurchases to provide price support for a stock that is deemed overvalued by short sellers.	1.7220***	Yes
Dividends-to-assets	Grullon and Michaely (2002) find that firms have gradually substituted dividends for repurchases.	-0.2231***	Yes
EBITDA-to-assets	Stephens and Weisbach (1998) find that firms tend to repurchase more shares if they have stronger cash flows.	0.1955***	Yes
Leverage	Dittmar (2000) shows that firms use repurchases to increase leverage.	-0.1849***	Yes
Options exercised	Dittmar (2000) finds that options exercised have a positive impact on repurchases, most likely because firms want to hold the number of shares outstanding constant and avoid dilution from option exercises.	-0.0215	No
Options outstanding	According to the management incentive hypothesis, firms with more outstanding stock options will repurchase more stock (Dittmar (2000); Fenn and Liang (2001)).	-0.0111	No
Relative spread	Liquidity influences how firms execute repurchase programs: On average, firms buy back more when liquidity is high, in order to save transaction costs (Hillert et al. (2016)).	-0.1364	No
Repurchase intensity (lagged)	Busch and Obernberger (2017) suggest that the lagged Repurchase intensity is the best predictor for current Repurchase intensity.	0.2332***	Yes
Return (t-1)	A motivation for share repurchases is undervaluation and one indication of undervaluation is a history of low returns. Stephens and Weisbach (1998) and Dittmar (2000)	-0.14746***	Yes
Target	Bagwell (1991) developed a theoretical model to show that repurchases may serve as a takeover defense and Dittmar (2000) finds that firms that are at a higher risk of being a target conduct more share repurchases.	0.0272***	Yes
Trading volume	This variable is used in Hillert et al. (2016) as a control variable	0.0478***	Yes

Table A2
The corporate calendar and the timing of equity-based compensation

This table presents regressions of equity-based compensation on *Blackout ratio*, which is the fraction of blackout days within a month, on dummies for the month in fiscal quarter, and on dummies for the month in fiscal year. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Granted equity and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Granted equity		
Blackout ratio		-0.1711***			-0.6899***
		(-18.36)			(-31.24)
Month in fiscal quarter=2			0.2293***		
			(29.75)		
Month in fiscal quarter=3			0.0317***		
			(4.54)		
Month in fiscal year=2				0.7413***	0.4545***
				(41.39)	(27.07)
Month in fiscal year=3				0.1262***	-0.0243*
				(8.95)	(-1.65)
Month in fiscal year=4				-0.0997***	-0.1323***
				(-9.14)	(-12.08)
Month in fiscal year=5				-0.0348***	-0.5935***
				(-2.81)	(-27.59)
Month in fiscal year=6				-0.1545***	-0.3390***
				(-13.27)	(-26.29)
Month in fiscal year=7				-0.1870***	-0.2205***
				(-18.63)	(-21.84)
Month in fiscal year=8				-0.1205***	-0.6815***
				(-10.22)	(-32.03)
Month in fiscal year=9				-0.2128***	-0.3958***
				(-18.97)	(-31.61)
Month in fiscal year=10				-0.2144***	-0.2512***
				(-20.75)	(-24.18)
Month in fiscal year=11				-0.1639***	-0.7257***
				(-14.01)	(-34.15)
Month in fiscal year=12				-0.1312***	-0.3166***
				(-10.75)	(-23.25)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0637	0.0653	0.0680	0.1008	0.1088
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel B: Vesting equity and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Vesting equity		
Blackout ratio		-0.1563***			-0.6411***
		(-18.39)			(-33.93)
Month in fiscal quarter=2			0.1890***		
			(26.25)		
Month in fiscal quarter=3			0.0199***		
			(3.14)		
Month in fiscal year=2				0.5915***	0.3250***
				(36.99)	(21.82)
Month in fiscal year=3				0.1195***	-0.0204
				(9.15)	(-1.51)
Month in fiscal year=4				-0.1152***	-0.1455***
				(-11.30)	(-14.21)
Month in fiscal year=5				-0.0495***	-0.5687***
				(-4.28)	(-30.19)
Month in fiscal year=6				-0.1883***	-0.3597***

Table A2 continued

	(1)	(2)	(3)	(4)	(5)
				(-17.41)	(-30.48)
Month in fiscal year=7				-0.1847***	-0.2158***
				(-19.06)	(-22.15)
Month in fiscal year=8				-0.1334***	-0.6546***
				(-11.88)	(-34.97)
Month in fiscal year=9				-0.2300***	-0.4000***
				(-21.88)	(-34.73)
Month in fiscal year=10				-0.2396***	-0.2738***
				(-24.29)	(-27.62)
Month in fiscal year=11				-0.1875***	-0.7096***
				(-16.70)	(-37.64)
Month in fiscal year=12				-0.1590***	-0.3313***
				(-14.35)	(-27.08)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0964	0.0981	0.1001	0.1306	0.1389
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel C: CEO sales and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			CEO selling		
Blackout ratio		-0.4902***			-0.8205***
		(-18.13)			(-17.07)
Month in fiscal quarter=2			0.2728***		
			(11.33)		
Month in fiscal quarter=3			0.0184		
			(0.85)		
Month in fiscal year=2				0.3506***	0.0095
				(8.78)	(0.24)
Month in fiscal year=3				0.1260***	-0.0530
				(3.42)	(-1.38)
Month in fiscal year=4				0.0703**	0.0315
				(2.10)	(0.94)
Month in fiscal year=5				0.3400***	-0.3245***
				(8.50)	(-5.93)
Month in fiscal year=6				0.0371	-0.1824***
				(1.07)	(-4.91)
Month in fiscal year=7				0.0798**	0.0400
				(2.52)	(1.26)
Month in fiscal year=8				0.3074***	-0.3598***
				(7.99)	(-6.66)
Month in fiscal year=9				0.0572*	-0.1604***
				(1.67)	(-4.36)
Month in fiscal year=10				0.0812**	0.0374
				(2.45)	(1.13)
Month in fiscal year=11				0.3252***	-0.3430***
				(7.98)	(-6.14)
Month in fiscal year=12				0.0855**	-0.1351***
				(2.45)	(-3.59)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0910	0.0923	0.0916	0.0917	0.0928
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Table A3
Vesting equity on the annual level

This table presents regressions of *Vesting equity* on the annual level. Firm fixed effects are controlled for throughout all specifications and year fixed effects are controlled for in specifications (2) - (5). T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Vesting equity		
CEO duality			0.3443***	0.3238***	0.2709**
			(3.45)	(3.24)	(2.06)
CEO tenure (ln)			0.4231***	0.3891***	0.5664***
			(7.82)	(7.15)	(7.88)
Return			2.7897***	4.6475***	6.1622***
			(4.12)	(6.84)	(6.63)
Return$_{t-1}$			9.4063***	10.2787***	13.4068***
			(12.87)	(14.15)	(12.58)
Assets$_{t-1}(ln)$			1.1850***	1.3649***	1.6057***
			(12.33)	(14.36)	(12.74)
Book-to-market$_{t-1}$			-0.7420***	-0.4845***	-0.7350***
			(-7.71)	(-4.93)	(-5.11)
EBITDA-to-assets			7.6849***	6.8309***	6.3747***
			(4.50)	(4.09)	(2.78)
EBITDA-to-assets$_{t-1}$			3.0560*	-0.5147	0.1353
			(1.95)	(-0.33)	(0.06)
Leverage$_{t-1}$				-3.5886***	-3.6962***
				(-11.15)	(-8.48)
CEO ownership				1.0178	2.9437***
				(1.52)	(2.89)
CEO unvested				0.1723***	0.0953
				(3.44)	(1.30)
Vesting schedule					-0.2072***
					(-2.84)
Granted equity					0.1404***
					(6.88)
Observations	21,818	21,818	13,859	13,859	8,791
Adjusted R^2	0.4478	0.5598	0.6004	0.6053	0.6356
Year FE	No	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Table A4

Further analyses on Vesting equity

This table presents regressions of *Vesting equity* on thirteen explanatory variables, alongside the corporate calendar controls. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:				Vesting equity			
CEO duality		0.0421***	0.0367***			0.0279***	0.0191
		(6.68)	(3.55)			(2.71)	(1.49)
CEO ownership			0.0280			0.0952	0.2432***
			(0.45)			(1.53)	(2.76)
CEO unvested			0.0082			0.0086	-0.0007
			(1.34)			(1.40)	(-0.08)
CEO tenure (ln)			0.0312***			0.0246***	0.0589***
			(6.04)			(4.76)	(8.70)
Stock price				0.0008***		0.0014***	0.0021***
				(7.03)		(8.58)	(8.95)
Return				0.0021		-0.0016	0.0028
				(0.22)		(-0.10)	(0.14)
Return$_{t-1}$				0.0382***		0.0448***	0.0588***
				(4.00)		(2.85)	(2.90)
Assets				0.0738***		0.0712***	0.0528***
				(14.88)		(8.57)	(4.99)
Book-to-market				-0.0225***		-0.0229***	-0.0392***
				(-6.92)		(-4.04)	(-5.02)
Dividends-to-assets				-0.1620***		-0.2169**	-0.4224***
				(-2.81)		(-2.37)	(-3.15)
Leverage				-0.2253***		-0.2225***	-0.1921***
				(-13.45)		(-8.10)	(-5.21)
Vesting schedule					-0.0134***		-0.0253***
					(-2.81)		(-3.73)
Granted equity					0.4116***		0.4266***
					(71.44)		(66.18)
Blackout ratio	-0.6411***	-0.6546***	-0.7456***	-0.6258***	-0.4106***	-0.7318***	-0.3974***
	(-33.93)	(-33.01)	(-27.50)	(-33.17)	(-16.66)	(-27.01)	(-12.93)
Observations	251,642	233,654	157,314	251,642	130,644	157,314	95,780
Adjusted R^2	0.1389	0.1395	0.1496	0.1417	0.3367	0.1522	0.3489
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A5
Firm characteristics and the relation between share repurchases and the number of vesting equity

This table examines whether firm characteristics are relevant for the relation between the CEO's vesting equity in numbers and share repurchases. The sample is split into two halves based on whether the CEO acts as the board chair, whether the independence of the board is below the median within the same year, whether the number of analysts is smaller than the median in the same year, whether firm size (as measured by assets) is below the median in the same year, and whether the firm's average delay in their earnings announcements is above the median, respectively. The delay in earnings announcements is equal to the gap between the current announcement date and the announcement date for the same fiscal quarter in the previous year, and is set to zero if there are no delays in earnings announcements. In Panel A, we re-run model (7) of Table 4 and in Panel B, we re-run model (8) of Table 4. In both panels, we include year-month fixed effects, firm fixed effects, and the standard controls described in Table A1 throughout all specifications. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Regression of Repurchase Intensity on Vesting equity without corporate calendar controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CEO Duality		Board Ind.		Analysts		Size		EA Delay	
	Yes	No	Low	High	Small	Large	Small	Large	High	Low
Dependent variable:	Repurchase intensity									
Vesting number (ln)	0.0594	0.1368***	0.0538	0.1063**	0.0266	0.1392***	-0.0016	0.1513***	0.0497	0.1421***
	(1.12)	(2.94)	(0.94)	(2.43)	(0.51)	(3.09)	(-0.03)	(3.50)	(0.96)	(3.00)
Observations	106,155	123,859	110,709	114,447	112,289	112,253	124,345	123,131	115,207	116,434

Panel B: Regression of Repurchase Intensity on Vesting equity with corporate calendar controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CEO Duality		Board Ind.		Analysts		Size		EA Delay	
	Yes	No	Low	High	Small	Large	Small	Large	High	Low
Dependent variable:	Repurchase intensity									
Vesting number (ln)	-0.0369	0.0513	-0.0170	0.0038	-0.0170	0.0377	-0.0528	0.0537	-0.0349	0.0453
	(-0.68)	(1.11)	(-0.29)	(0.09)	(-0.33)	(0.82)	(-1.11)	(1.22)	(-0.68)	(0.94)
Observations	106,155	123,859	110,709	114,447	112,289	112,253	124,345	123,131	115,207	116,434

Table A6

CEO sales around buyback program announcements

This table presents three events together with the CEO sales 10 days before the event (in column (2)), the CEO sales 10 days after the event (in column (3)), and the difference between them (in column (4)). The events are buyback announcement, earnings announcement, and buyback announcement without any days in [-10, 10] that fall in the blackout period. The table also presents the blackout days 10 days before the event (in column (5)), the blackout days 10 days after the event (in column (6)), and the difference between them (in column (7)). Columns (4) and (7) show t-tests of the difference between pre and post-period. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Event	Observations	CEO sales over		(3) − (2)	Blackout days		(6) − (5)
		[-10, 0)	(0, +10]		[-10, 0)	(0, +10]	
Buyback announcement	4,379	0.0038	0.0076	0.0038*** (4.56)	0.6809	0.4194	-0.2615*** (-32.92)
Earnings announcement	65,817	0.0018	0.0124	0.0106*** (28.52)	1.0000	0.2219	-0.7781*** (-1223.00)
Buyback ann. no blackout	444	0.0061	0.0053	-0.0008 (-0.30)	0.0000	0.0000	0.0000 (.)

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Table A7
CEO trading and the decision to initiate a buyback program

This table estimates linear probability models of buyback program announcements. The dependent variable is an indicator that is equal to one if there is a repurchase program announcement in the current month and zero otherwise. The columns with uneven numbers show the regressions without controls for the corporate calendar and the columns with even numbers with controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Dependent variable:	Indicator of buyback announcement					
	(1)	(2)	(3)	(4)	(5)	(6)
CEO selling	0.0002	0.0001				
	(1.57)	(0.78)				
CEO buying	0.1309***	0.1187***				
	(3.94)	(3.57)				
CEO selling (ln)			0.0016*	0.0006		
			(1.93)	(0.68)		
CEO buying (ln)			0.1479***	0.1341***		
			(4.07)	(3.69)		
CEO selling dummy					0.0017	-0.0004
					(1.20)	(-0.29)
CEO buying dummy					0.0167***	0.0154***
					(5.34)	(4.93)
Blackout ratio		-0.0342***		-0.0341***		-0.0343***
		(-12.54)		(-12.52)		(-12.57)
Observations	251,642	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0173	0.0199	0.0173	0.0199	0.0174	0.0199
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes

Table A8
Share repurchases, equity-based compensation, and buy and hold abnormal returns

This table reports the t-test results of buy-and-hold abnormal returns (BHAR) in repurchasing months when the CEO's equity vests simultaneously. We calculate BHARs as compounded monthly returns over various time periods (from two months before to four years after the current month), subtracting the compounded monthly value-weighted market returns. First, we test whether the BHARs differ from zero for the full sample of repurchasing months when the CEO's equity vests simultaneously. Then, we split the sample into terciles based on the value of *Vesting equity* (relative to other observations in the same year) and test whether the BHARs of each tercile differ from zero. T-statistics are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variable:				Buy-and-hold abnormal returns			
Event window:	[-2, -2]	[-1, -1]	[0, 0]	[1,12]	[13, 24]	[25, 36]	[37, 48]
Full sample	-0.0006	-0.0041***	0.0036***	0.0323***	0.0335***	0.0308***	0.0300***
(N=9,487)	(-0.70)	(-4.37)	(3.79)	(7.60)	(7.42)	(6.66)	(6.24)
Vesting equity low	-0.0030*	-0.0098***	0.0060***	0.0503***	0.0531***	0.0492***	0.0495***
(N=3,267)	(-1.68)	(-5.29)	(3.03)	(5.20)	(4.95)	(4.47)	(4.27)
Vesting equity medium	-0.0019	-0.0043***	-0.0003	0.0219***	0.0214***	0.0195***	0.0172**
(N=3,111)	(-1.25)	(-2.62)	(-0.22)	(3.41)	(3.40)	(2.98)	(2.56)
Vesting equity high	0.0032***	0.0020	0.0050***	0.0243***	0.0255***	0.0232***	0.0228***
(N=3,109)	(2.60)	(1.50)	(3.89)	(4.72)	(4.95)	(4.53)	(4.44)

B Figures

Figure 1

The timing of buyback programs and equity grants from the perspective of the earnings announcement

Panel A: Buyback program announcement date versus earnings announcement date
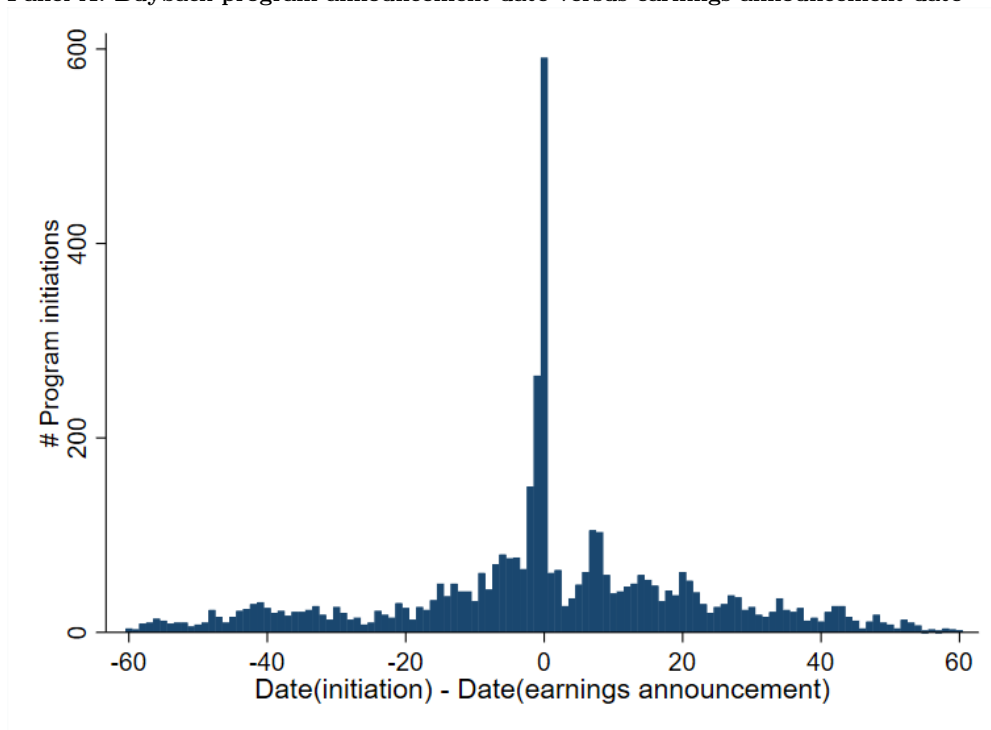
Panel B: Equity grant date versus earnings announcement date
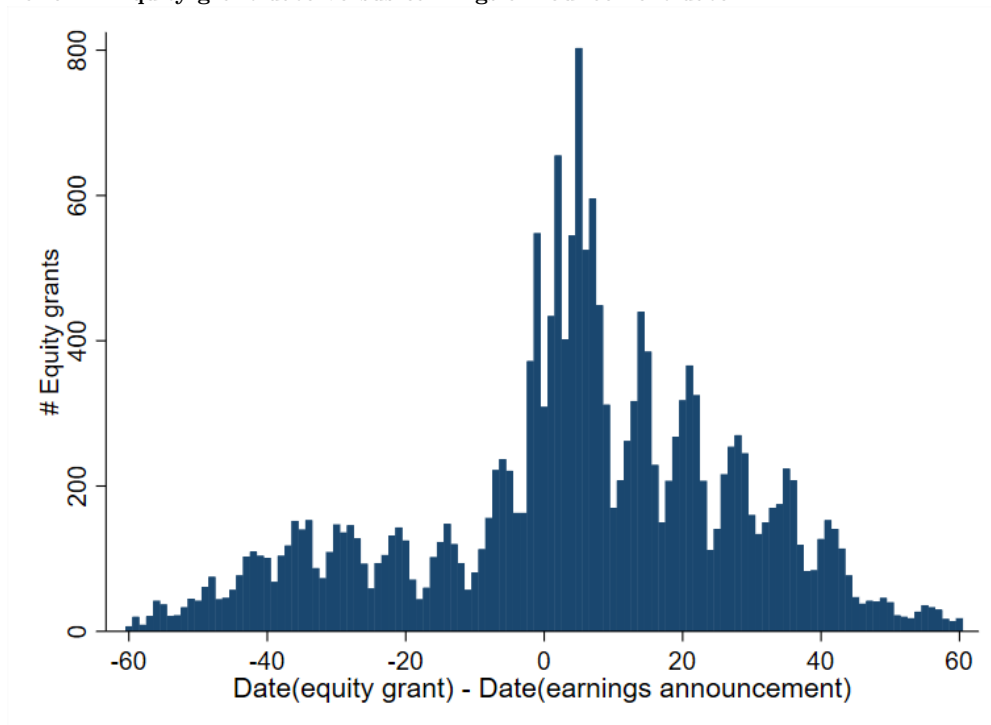
The graphs depict the timing of events relative to earnings announcements. Panel A shows the difference in calendar days between the announcement of a buyback program and the announcement of earnings. Panel B shows the difference in calendar days between the granting of equity and the announcement of earnings.

Figure 2
Trading activities during trading windows and blackout periods

Panel A: Share repurchases during trading windows and blackout periods
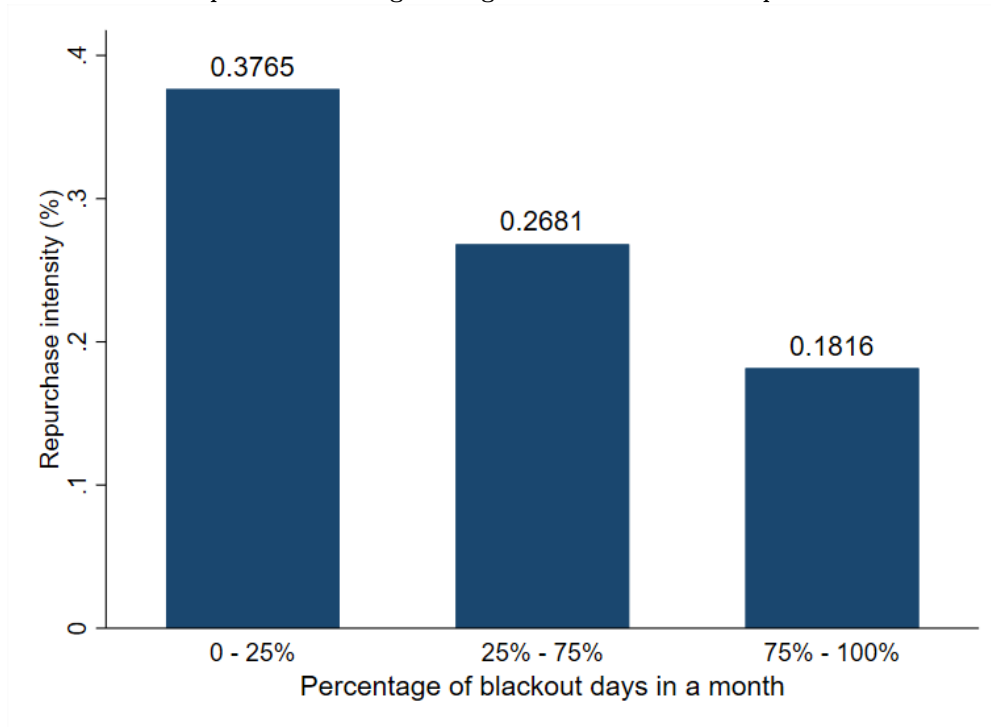
Panel B: CEO equity selling during trading windows and blackout periods
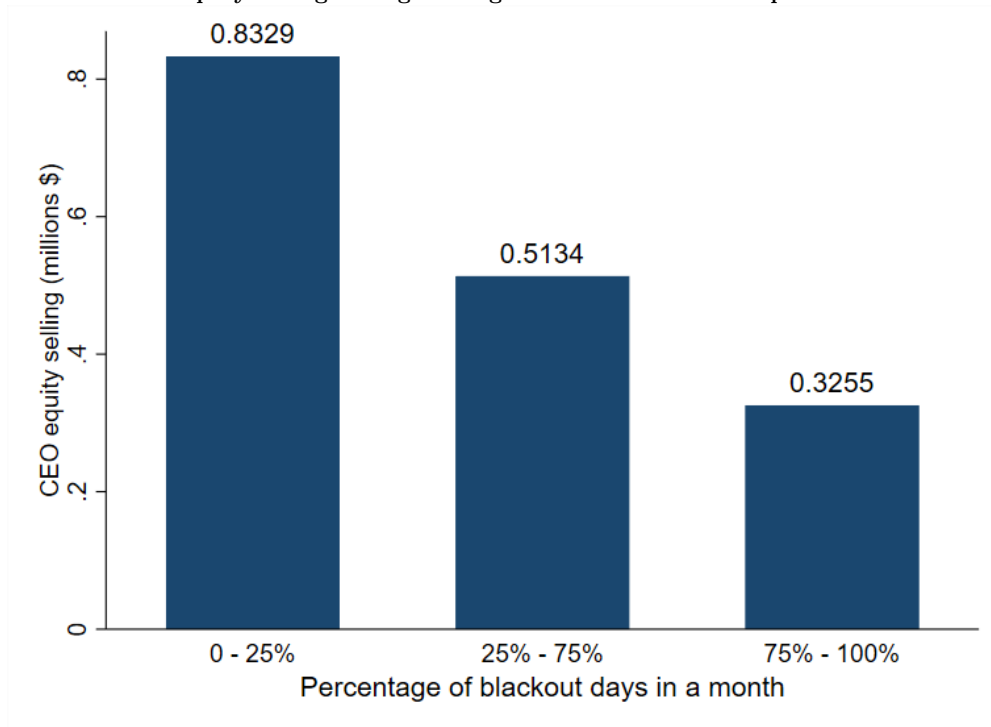
The graphs show the average of trading activities over different percentages of blackout days in a given month. We define the blackout period as the period from 20 days before the end of a firm's fiscal quarter until three days after the following earnings announcement. A detailed discussion of this measure can be found in Section 4.1.2. Panel A depicts the *Repurchase intensity* by the firm and Panel B depicts equity selling by the CEO.

Figure 3
Timing of share repurchases and equity-based compensation within a fiscal quarter
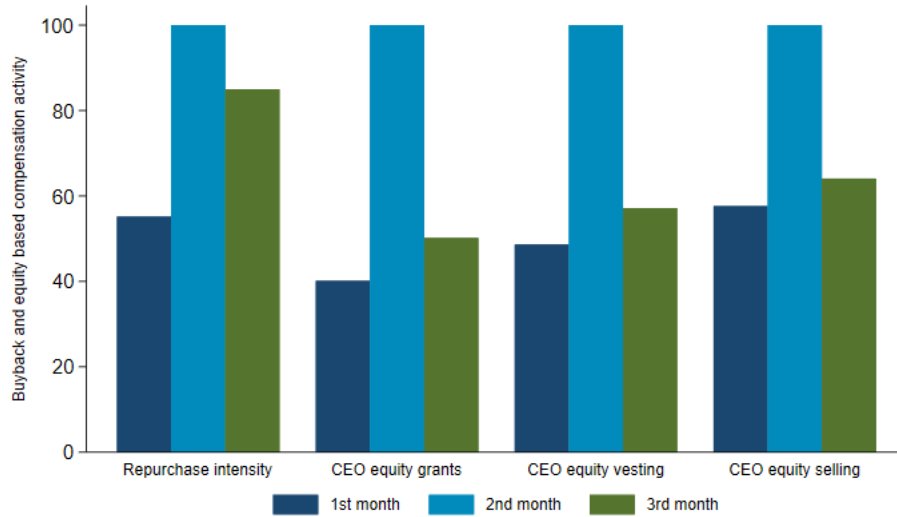
The graph plots the average of *Repurchase intensity* and the CEO's equity grants (*Granted equity*), the CEO's vesting equity (*Vesting equity*), and the CEO's equity sales (*CEO selling*) over the three months in a fiscal quarter. The numbers are normalized such that the second fiscal quarter-month represents 100 for each category.

Figure 4
Buyback program initiations and equity grants over the fiscal year

Panel A: Buyback program initiations over the fiscal year
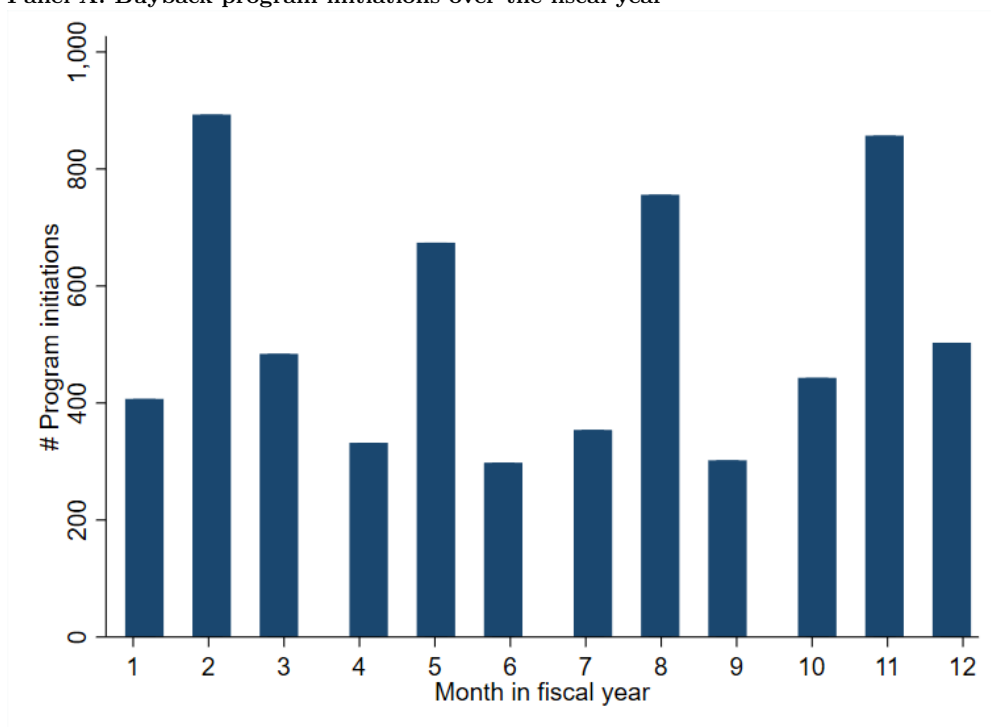
Panel B: Equity grants over the fiscal year
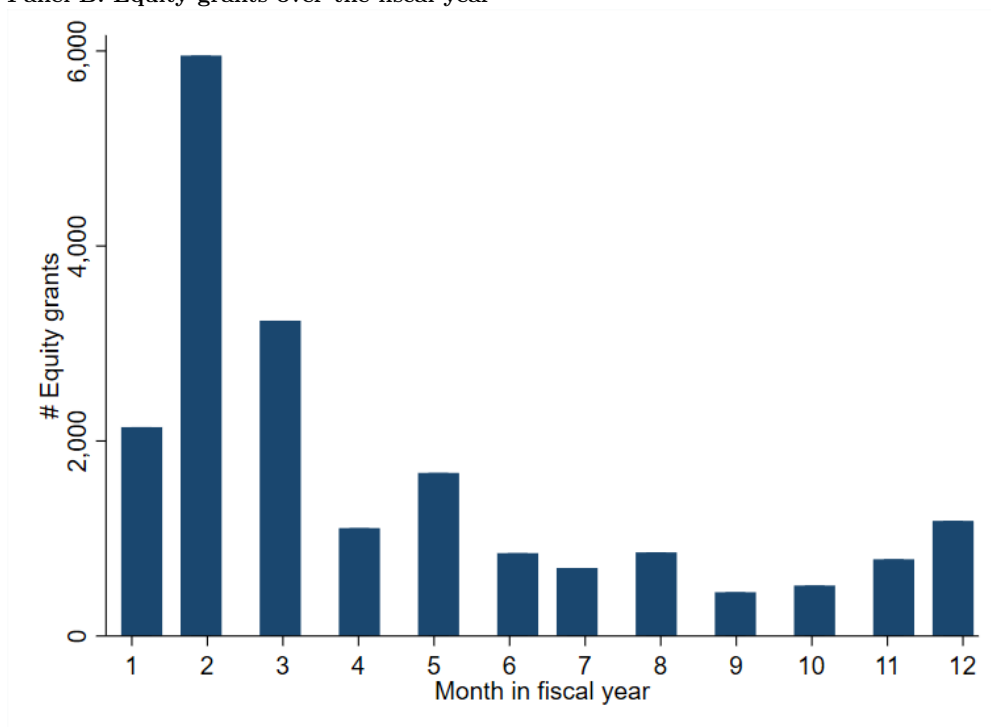
The graphs plot the timing of corporate events throughout the fiscal year. Panel A depicts the initiation of buyback programs over the twelve months of the fiscal year and Panel B depicts the granting of equity over the twelve months of the fiscal year.

C Tables

Table 1
Definition of variables

This table presents all variables used in this paper. For each variable the table reports the definition, the data source, and the unit of measurement. Variables denoted with (ln) are expressed as natural logarithms using the formula $\ln(1+x)$ where x is the variable in question (in the rest of the paper, we call it "natural logarithms" for brevity).

Name	Definition	Source	Unit
Program and repurchase variables			
Program length	The total number of months the repurchase program lasts	SEC	Integer
Program size	The maximal number of shares (maximal dollar amount) that could be purchased divided by the number of shares outstanding at the time of the announcement	SEC	Ratio
Repurchase dummy	1 if repurchase transaction takes place in a month	SEC	Binary
Repurchase intensity	Number of shares repurchased under a program during the month divided by the number of shares outstanding at the beginning of the month, multiplied by 100	SEC/CRSP	Percent
Corporate calendar and equity compensation variables			
Blackout ratio	Fraction of blackout days within a month. We define the blackout period as from 20 days before the end of a firm's fiscal quarter (Compustat: *apdedateq*) until three days after the following earnings announcement (Compustat: *rdq*), following Guay et al. (2022). See Section 4.1.2 for further details.	Compustat	Ratio
CEO unvested	The total stock-split adjusted amount of unvested equity in a year	Equilar	Million
Granted dummy	1 if equity is granted in a month	Equilar	Binary
Granted equity	The total volume of granted equity in a month	Equilar	Million $
Granted number	The total stock-split adjusted amount of granted equity in a month	Equilar	Million
Vesting dummy	1 if equity vests in a month	Equilar	Binary
Vesting equity	The total volume of equity vesting in a month	Equilar	Million $
Vesting number	The total stock-split adjusted amount of equity vesting in a month	Equilar	Million
Vesting schedule	The sum of the number of securities granted in a particular year multiplied by their respective vesting period, divided by the total number of securities granted in that particular year	Equilar	Ratio
Insider trading variables			
Affiliates buying (ln)	Total insider purchases by Affiliates in a month	TR Insider Data	Million $
Affiliates selling (ln)	Total insider sales by Affiliates in a month	TR Insider Data	Million $
CEO buying (ln)	Total CEO purchases in a month	TR Insider Data	Million $
CEO selling (ln)	Total CEO sales in a month	TR Insider Data	Million $
CEO selling dummy	1 if there are CEO sales in a month	TR Insider Data	Binary
CEO selling number (ln)	Total stock-split adjusted amount of CEO sales in a month	TR Insider Data	Million
CxO buying (ln)	Total insider buying by CFOs, CIs, COs and CTs in a month	TR Insider Data	Million $
CxO selling (ln)	Total insider sales by CFOs, CIs, COs and CTs in a month	TR Insider Data	Million $
Directors buying (ln)	Total insider buying by Directors in a month	TR Insider Data	Million $
Directors selling (ln)	Total insider sales by Directors in a month	TR Insider Data	Million $
Insider trading (ln)	Net insider trading (Insider buying (ln) - Insider selling (ln)) in a month	TR Insider Data	Million $
Insider buying (ln)	Total insider buying in a month	TR Insider Data	Million $
Insider selling (ln)	Total insider sales in a month	TR Insider Data	Million $

Table 1 continued

Variable	Description	Source	Unit
Officers buying (ln)	Total insider buying by Officers in a month	TR Insider Data	Million $
Officers selling (ln)	Total insider sales by Officers in a month	TR Insider Data	Million $
Owners buying (ln)	Total insider buying by Benefical owners in a month	TR Insider Data	Million $
Owners selling (ln)	Total insider sales by Benefical owners in a month	TR Insider Data	Million $
Control variables			
Acquiror	1 if the firm is currently (time between announcement and end of the offer) bidding for another company	SDC	Binary
Assets (ln)	Total assets (Compustat item: atq)	Compustat	Million $
Board independence	The ratio of directors who are independent	Boardex	Ratio
Book-to-market	Book value equity (Compustat item: ceqq) divided by market capitalization	Compustat	Ratio
Cash-to-assets	Cash and short-term investments (Compustat item: cheq) divided by total assets	Compustat	Ratio
Change in short interest	Change in short interest as of the 15th business day scaled by the shares outstanding at the end of the previous month	Compustat	Ratio
CEO duality	1 if the CEO also serves as the chair of the board	Execucomp/Boardex	Binary
CEO ownership	The sum of "Shares Held" and "Total Exercisable Options", divided by "Shares Outstanding"	Equilar	Ratio
CEO tenure (ln)	The number of years of the CEO's tenure	Equilar	Integer
Dividends-to-assets	Total dividends (Compustat item: dvt) divided by total assets	Compustat	Ratio
EA delay	The delay in earnings announcement date relative to the date in the previous year. 0 if there is no delay.	Compustat	Days
EBITDA-to-assets	Operating income before depreciation (Compustat item: oibdpq) divided by total assets	Compustat	Ratio
Leverage	(Total asset - book value equity) / (total asset - book value equity + market capitalization)	Compustat/CRSP	Ratio
Market capitalization (ln)	Monthly average of daily market capitalization	CRSP	Million $
Number of analysts	The number of analysts who follow the firm	I/B/E/S	Integer
Options exercised	Number of shares obtained by option exercises of corporate insiders in the respective month scaled by shares outstanding	TR Insider Data	Ratio
Options outstanding	Outstanding options scaled by shares outstanding	Compustat	Ratio
Program month	The n-th month after the repurchase program initiation	SEC	Binary
Relative spread	The monthly average of the daily relative spread calculated as 2*(ask-bid)/(bid+ask)	CRSP	Ratio
Return	Monthly holding period stock return	CRSP	Ratio
Shares outstanding	Number of shares outstanding at last trading day of month	CRSP	Million
Target	1 if firm is currently (time between announcement and end of the offer) a target of another company	SDC	Binary
Trading volume	Monthly total trading volume excluding repurchases scaled by shares outstanding at the last trading day of the previous month	CRSP	Ratio

Table 2
Descriptive statistics

This table reports the descriptive statistics for the dependent variables, main explanatory variables, and the control variables for firms that conducted at least one share repurchase between 2006 and 2019. All variables are defined in Table 1. For each variable, the arithmetic mean, the median, the standard deviation, the within-firm standard deviation, the 25th percentile, the 75th percentile of the distribution, the minimum value, the maximum value and the skewness are reported. Within-firm variation is calculated from a regression of the respective variable on firm fixed effects. Variables denoted with (ln) are expressed as natural logarithms. All continuous variables are winsorized at the 1st and 99th percentile (except for *Repurchase intensity*, which has been manually checked).

	Mean	Median	SD	SD (within)	25th Perc.	75th Perc.	Min	Max	Skewness	Observations
Program and repurchase statistics										
Program length	20.5093	13	21.1660	14.9769	7	25	1	160	2.3840	6,303
Program size	0.0799	0.0628	0.0663	0.0403	0.03855	0.1007	0	0.4999	2.5368	6,303
Repurchase dummy	0.2348	0	0.4239	0.3646	0	0	0	1	1.2514	251,642
Repurchase intensity (%)	0.1523	0	0.5727	0.5527	0	0	0	27.1563	11.9182	251,642
Repurchase intensity>0 (%)	0.6488	0.3526	1.0368	0.9151	0.1343	0.7746	0	27.1563	7.0206	59,082
Repurchase intensity (ln)	0.0954	0	0.2528	0.2370	0	0	0	3.3378	3.7652	251,642
Corporate calendar and equity compensation variables										
Blackout ratio	0.6360	0.7000	0.3438	0.3338	0.3667	1	0	1	-0.6899	251,642
Month in fiscal quarter	2.0023	2	0.8165	0.8165	1	3	1	3	-0.0041	251,642
Month in fiscal year	6.5413	7	3.4476	3.4447	4	10	1	12	-0.0141	251,642
CEO unvested	0.3831	0.1482	0.9196	0.6821	0.003319	0.4122	0	36.3439	11.8857	251,642
Granted equity	0.2133	0	1.0137	0.9896	0	0	0	7.6673	5.4912	251,642
Granted equity (ln)	0.0839	0	0.3501	0.3426	0	0	0	2.1596	4.5276	251,642
Granted dummy	0.0773	0	0.2671	0.2630	0	0	0	1	3.1644	251,642
Granted number	0.0110	0	0.0846	0.0834	0	0	0	18.2627	81.2243	247,491
Granted number (ln)	0.0094	0	0.0489	0.0479	0	0	0	2.9582	10.9659	247,491
Vesting equity	0.2280	0	0.9247	0.8937	0	0	0	8.2282	5.4375	251,642
Vesting equity (ln)	0.1055	0	0.3486	0.3361	0	0	0	2.2223	3.9035	251,642
Vesting dummy	0.1537	0	0.3606	0.3471	0	0	0	1	1.9206	251,642
Vesting number	0.0091	0	0.0378	0.0365	0	0	0	1.4231	8.8549	247,491
Vesting number (ln)	0.0084	0	0.0331	0.0319	0	0	0	0.8850	6.8777	247,491
Vesting schedule	2.4447	2.5	0.7884	0.4533	2	3	0	6	0.3440	130,648
Insider trading variables										
Affiliates buying (ln)	0	0	0	0	0	0	0	0	0	251,642
Affiliates selling (ln)	0.0102	0	0.0660	0.0628	0	0	0	0.7006	7.4197	251,642
CEO buying (ln)	0.0011	0	0.0116	0.0114	0	0	0	0.2499	14.7008	251,642
CEO selling (ln)	0.1128	0	0.4825	0.4503	0	0	0	3.9960	4.9053	251,642
CEO selling	0.5046	0	3.2001	3.0648	0	0	0	53.3791	10.7148	251,642
CEO selling dummy	0.0808	0	0.2725	0.2501	0	0	0	1	3.0776	251,642
CEO selling number	0.0171	0	0.1463	0.1399	0	0	0	28.1786	59.5012	247,491
CEO selling number (ln)	0.0129	0	0.0774	0.0729	0	0	0	3.3734	10.2265	247,491
CxO buying (ln)	0.0000	0	0.0009	0.0008	0	0	0	0.0232	22.5359	251,642
CxO selling (ln)	0.0549	0	0.2598	0.2452	0	0	0	2.3598	5.6352	251,642

Continued on next page

Table 2 continued

								N
Directors buying (ln)	0.0105	0.0760	0.0746	0	0	0	1.2527	9.8796	251,642
Directors selling (ln)	0.1521	0.5773	0.5404	0	0	0	4.4904	4.5709	251,642
Insider buying (ln)	0.0150	0.0970	0.0945	0	0	0	2.0104	9.7725	251,642
Insider selling (ln)	0.4109	0.9170	0.8215	0	0.1490	0	5.4419	2.4743	251,642
Insider trading (ln)	-0.3959	0.9208	0.8249	-0.1387	0	-5.4420	2.0071	-2.4224	251,642
Officers buying (ln)	0.0003	0.0037	0.0036	0	0	0	0.0938	19.4319	251,642
Officers selling (ln)	0.1953	0.6323	0.5802	0	0	0	4.3377	3.8397	251,642
Owners buying (ln)	0.0034	0.0568	0.0550	0	0	0	1.5228	21.8156	251,642
Owners selling (ln)	0.0153	0.1419	0.1350	0	0	0	2.0563	10.2951	251,642
Control variables									
Acquiror	0.0348	0	0.1833	0.1580	0	0	1	5.0760	251,642
Assets (ln)	6.8681	6.8612	1.9145	0.4129	5.5550	8.1589	12.3357	0.0690	251,642
Board independence	0.7796	0.8000	0.1228	0.0619	0.7143	0.8750	1	-1.1063	243,256
Book-to-market	0.5467	0.4384	0.5385	0.3668	0.2532	0.7178	6.2211	2.4432	251,642
Cash-to-assets	0.1806	0.1148	0.1846	0.0847	0.0406	0.2607	0.9739	1.4550	251,642
Change in short interest	0.0001	-0.0001	0.0107	0.0107	-0.0034	0.0033	0.0546	0.1566	251,642
CEO duality	0.4612	0	0.4985	0.2936	0	1	1	0.1558	233,654
CEO ownership	0.0362	0.0115	0.0687	0.0404	0	0.0373	0.4847	3.4858	251,642
CEO tenure (ln)	1.9459	1.9601	0.7576	0.4944	1.3863	2.5014	4.0448	-0.0944	168,644
Dividends-to-assets	0.0142	0	0.0305	0.0213	0	0.0174	0.3266	4.6074	251,642
EA delay	1.5203	0	3.0092	3.0092	0	1	30	2.9499	217,594
EBITDA-to-assets	0.0301	0.0315	0.0373	0.0263	0.0181	0.0461	0.1375	-3.4727	251,642
Leverage	0.3358	0.3002	0.2143	0.1043	0.1630	0.4740	0.9894	0.6642	251,642
Number of analysts	54.4204	43	41.9597	14.8014	23	77	300	1.2284	229,677
Options exercised	0.0007	0	0.0270	0.0267	0	0	7.1065	149.6178	251,642
Options outstanding	0.0642	0.0480	0.0677	0.0432	0.0188	0.0893	3.1210	6.9455	251,642
Relative spread (ln)	-4.8959	-5.049	0.2483	0.2277	-5.1108	-4.6110	-4.4882	0.4160	251,642
Return	0.0107	0.0070	0.1358	0.1354	-0.0550	0.0693	4.1404	2.4955	251,642
Target	0.0281	0	0.1651	0.1444	0	0	1	5.7165	251,642
Trading volume	0.2009	0.1489	0.1911	0.1351	0.08219	0.2532	1.9481	2.5675	251,642

Table 3
The corporate calendar and the timing of share repurchases

This table presents regressions of *Repurchase intensity* on *Blackout ratio*, which is the fraction of blackout days within a month, on dummies for the month in fiscal quarter, and on dummies for the month in fiscal year. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Repurchase intensity		
Blackout ratio		-0.1463***			-0.2059***
		(-27.53)			(-23.70)
Month in fiscal quarter=2			0.0894***		
			(20.52)		
Month in fiscal quarter=3			0.0475***		
			(11.13)		
Month in fiscal year=2				0.0579***	-0.0277***
				(8.87)	(-3.91)
Month in fiscal year=3				0.0684***	0.0234***
				(9.60)	(3.19)
Month in fiscal year=4				0.0132**	0.0035
				(2.22)	(0.58)
Month in fiscal year=5				0.1038***	-0.0630***
				(13.50)	(-6.32)
Month in fiscal year=6				0.0331***	-0.0219***
				(4.86)	(-3.00)
Month in fiscal year=7				-0.0055	-0.0155***
				(-1.00)	(-2.83)
Month in fiscal year=8				0.0948***	-0.0727***
				(12.36)	(-6.97)
Month in fiscal year=9				0.0357***	-0.0189**
				(5.03)	(-2.53)
Month in fiscal year=10				-0.0084	-0.0194***
				(-1.52)	(-3.51)
Month in fiscal year=11				0.1000***	-0.0677***
				(13.21)	(-6.59)
Month in fiscal year=12				0.0522***	-0.0031
				(7.62)	(-0.43)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0727	0.0765	0.0744	0.0748	0.0770
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Table 4
The corporate calendar and the correlation between share repurchases and equity-based compensation

This table presents OLS regressions of *Repurchase intensity* on the granting, vesting, and selling of equity, and controls for the corporate calendar. In Panel A, the relationship between share repurchases and granted equity is examined. Panels B and C present the relationship between share repurchases and vesting equity, and share repurchases and CEO sales, respectively. For each of the panels, the dollar amount of the equity-based compensation variable is presented in columns (1) and (2), and the logarithmic values are shown in columns (3) and (4). The number of shares of the equity-based compensation variable in logs is presented in columns (5) and (6). Lastly, the binary variant is shown in columns (7) and (8). The columns with uneven numbers show the regressions without controls for the corporate calendar and the columns with even numbers with controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. The difference between the equity-based compensation coefficients of the specification without corporate calendar controls and the specification with corporate calendar controls is tested using a two-sample t-test. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Share repurchases, the CEO's granted equity, and the corporate calendar

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:				Repurchase intensity				
Granted equity	0.0036***	0.0002						
	(3.25)	(0.15)						
Granted equity (ln)			0.0105***	0.0004				
			(3.27)	(0.11)				
Granted number (ln)					0.0650**	0.0098		
					(2.54)	(0.38)		
Granted dummy							0.0107***	-0.0010
							(2.66)	(-0.24)
Blackout ratio		-0.2061***		-0.2061***		-0.2047***		-0.2063***
		(-24.04)		(-24.04)		(-23.84)		(-24.17)
Observations	251,642	251,642	251,642	251,642	247,489	247,489	251,642	251,642
Adjusted R^2	0.1291	0.1340	0.1292	0.1340	0.1298	0.1346	0.1291	0.1340
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1):	-2.7738***	(4)-(3):	-2.9443***	(6)-(5):	-2.1486**	(8)-(7):	-2.8569 ***

Continued on next page

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Table 4 continued

Panel B: Share repurchases, the CEO's vesting equity, and the corporate calendar

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Repurchase intensity							
Vesting equity	0.0038*** (3.39)							
Vesting equity (ln)		-0.0002 (-0.14)	0.0112*** (3.66)					
Vesting number (ln)				0.0001 (0.03)	0.1057*** (3.10)	0.0140 (0.41)		
Vesting dummy							0.0092*** (3.05)	0.0004 (0.13)
Blackout ratio		-0.2063*** (-24.08)		-0.2062*** (-24.05)		-0.2047*** (-23.82)		-0.2061*** (-24.12)
Observations	251,642	251,642	251,642	251,642	247,489	247,489	251,642	251,642
Adjusted R^2	0.1291	0.1340	0.1292	0.1340	0.1298	0.1346	0.1291	0.1340
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1):	-3.1152***	(4)-(3):	-3.4691***	(6)-(5):	-2.6655 **	(8)-(7):	-2.8882***

Panel C: Share repurchases, the CEO's equity sales, and the corporate calendar

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Repurchase intensity							
CEO selling	-0.0011*** (-3.22)							
CEO selling (ln)		-0.0016*** (-4.86)	-0.0047** (-2.16)					
CEO selling number (ln)				-0.0102*** (-4.66)	-0.0068 (-0.46)	-0.0302** (-2.04)		
CEO selling dummy							-0.0003 (-0.07)	-0.0114** (-2.54)
Blackout ratio		-0.2074*** (-24.40)		-0.2080*** (-24.42)		-0.2056*** (-24.04)		-0.2074*** (-24.33)
Observations	251,642	251,642	251,642	251,642	247,489	247,489	251,642	251,642
Adjusted R^2	0.1291	0.1340	0.1291	0.1340	0.1297	0.1347	0.1291	0.1340
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1):	-1.4904	(4)-(3):	-2.5201**	(6)-(5):	-1.5818	(8)-(7):	-2.5295**

Table 5
Firm characteristics and the relation between share repurchases and vesting equity

This table examines whether firm characteristics are relevant for the relation between the CEO's vesting equity and share repurchases. The sample is split into two halves based on whether the CEO acts as the board chair, whether the independence of the board is below the median within the same year, whether the number of analysts is smaller than the median in the same year, whether firm size (as measured by assets) is below the median in the same year, and whether the firm's average delay in their earnings announcements is above the median, respectively. The delay in earnings announcements is equal to the gap between the current announcement date and the announcement date for the same fiscal quarter in the previous year, and is set to zero if there are no delays in earnings announcements. In Panel A, we re-run model (3) of Table 4 and in Panel B, we re-run model (4) of Table 4. In both panels, we include year-month fixed effects, firm fixed effects, and the standard controls described in Table A1 throughout all specifications. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Regression of Repurchase Intensity on Vesting equity without corporate calendar controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CEO Duality		Board Ind.		Analysts		Size		EA Delay	
	Yes	No	Low	High	Small	Large	Small	Large	High	Low
Dependent variable:					Repurchase intensity					
Vesting equity (ln)	0.0058	0.0164***	0.0076*	0.0112***	0.0022	0.0131***	-0.0014	0.0142***	0.0089*	0.0123***
	(1.30)	(3.69)	(1.69)	(2.68)	(0.37)	(3.57)	(-0.24)	(4.00)	(1.67)	(3.26)
Observations	107,754	125,900	113,483	115,367	113,779	113,841	125,824	125,805	116,790	118,573

Panel B: Regression of Repurchase Intensity on Vesting equity with corporate calendar controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CEO Duality		Board Ind.		Analysts		Size		EA Delay	
	Yes	No	Low	High	Small	Large	Small	Large	High	Low
Dependent variable:					Repurchase intensity					
Vesting equity (ln)	-0.0064	0.0062	-0.0016	-0.0008	-0.0042	0.0019	-0.0084	0.0029	-0.0013	0.0007
	(-1.40)	(1.41)	(-0.34)	(-0.19)	(-0.71)	(0.50)	(-1.46)	(0.81)	(-0.25)	(0.18)
Observations	107,754	125,900	113,483	115,367	113,779	113,841	125,824	125,805	116,790	118,573

Table 6
Share repurchases, insider trading, and the corporate calendar

This table presents OLS regressions of *Repurchase intensity* on insider trading variables and controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. We furthermore include the standard controls which are described in Table A1 throughout all specifications. In column (1), we define *Insider trading* (ln) as the difference between *Insider buying* (ln) and *Insider selling* (ln). T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Repurchase intensity		
Insider trading (ln)	-0.0082***	-0.0012			
	(-5.43)	(-0.75)			
Insider buying (ln)			0.1006***		
			(5.03)		
Insider selling (ln)			0.0024		
			(1.57)		
CEO buying (ln)				0.1568	0.2126
				(0.85)	(1.15)
CEO selling (ln)				-0.0117***	-0.0101***
				(-4.98)	(-4.30)
CxO buying (ln)				1.1174	1.6863
				(0.51)	(0.77)
CxO selling (ln)				-0.0034	0.0004
				(-0.62)	(0.08)
Officers buying (ln)				0.9949**	1.1649**
				(2.01)	(2.35)
Officers selling (ln)				0.0018	0.0082***
				(0.82)	(3.75)
Directors buying (ln)				0.1196***	0.1428***
				(5.16)	(6.15)
Directors selling (ln)				0.0027	0.0077***
				(1.02)	(2.91)
Owners buying (ln)				0.0116	0.0107
				(0.29)	(0.26)
Owners selling (ln)				0.0604***	0.0610***
				(4.02)	(4.05)
Affiliates selling (ln)				0.0090	0.0230
				(0.52)	(1.33)
Blackout ratio		-0.2055***	-0.2028***	-0.2040***	
		(-24.05)	(-23.70)	(-23.90)	
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.1292	0.1340	0.1342	0.1346	0.1300
Standard controls	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	Yes	Yes	No

Table 7
The price impact of open market share repurchases

This table reports Fama and French calendar-time portfolio regressions for various event windows following open market repurchases. Equally-weighted calendar-time portfolios are built and rebalanced for each month between 2007 and 2019, using 59,082 open market repurchases between 2006 and 2019. During the first year, 2006, after the start of the new regulation about equity-based compensation, not all firms were immediately reporting to the new standard. Hence, in order to avoid biased portfolios at the beginning of the sample, we start the time series regressions in 2007. We regress the monthly excess return of this portfolio on the Fama-French three factors (Fama and French, 1993, Fama and French, 1996). Each included stock has an equal weight in the monthly portfolio, regardless of whether it has one or more events during the event window. For the window of [0, 0], a firm is included in this portfolio if it repurchases shares in the current month (month 0). For other windows, a firm is included if it repurchases shares within the specified range of preceding months. For instance, a firm is included in the [1, 1] portfolio if it repurchased shares in the prior month (month -1), and in the [1, 12] portfolio if it repurchased shares anytime from the prior month (month -1) up to 12 months ago (month -12). Panels B and C provide results for subsamples. Panel B examines repurchases when the CEO's equity vests simultaneously. Panel C examines repurchases when the CEO sells equity simultaneously. Panel D examines CEO sales in general (not restricting to repurchase months). Tercile ranges for low, medium, and high are based on all non-zero values of *Vesting equity* (for Panels C and D, *CEO selling*) in a given calendar year. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Abnormal returns to open market share repurchases

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 1]	[2, 3]	[4, 6]	[7, 12]	[1, 12]
Constant	0.0006	0.0032***	0.0032***	0.0025***	0.0021**	0.0025***
	(0.73)	(3.76)	(3.87)	(3.05)	(2.35)	(2.86)
MktRF	0.9718***	0.9936***	0.9923***	1.0066***	1.0119***	1.0226***
	(50.91)	(46.63)	(48.06)	(49.73)	(45.11)	(46.73)
SMB	0.5460***	0.5105***	0.5345***	0.5564***	0.5814***	0.6049***
	(15.38)	(12.88)	(13.92)	(14.78)	(13.94)	(14.86)
HML	0.0560*	0.0798**	0.0967***	0.1230***	0.1894***	0.1673***
	(1.92)	(2.45)	(3.06)	(3.97)	(5.52)	(5.00)
Observations	156	156	156	156	156	156
R^2	0.9641	0.9568	0.9600	0.9631	0.9570	0.9598

Panel B: Abnormal returns to open market share repurchases when the CEO's equity vests simultaneously

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 1]	[2, 3]	[4, 6]	[7, 12]	[1, 12]
Full sample	0.0022*	0.0020	0.0039***	0.0022**	0.0027***	0.0030***
(N=9,486)	(1.68)	(1.59)	(3.55)	(2.16)	(3.03)	(3.58)
Vesting equity low	0.0052	0.0025	0.0037	0.0032	0.0025	0.0029**
(N=2,140)	(1.54)	(0.70)	(1.56)	(1.39)	(1.45)	(2.15)
Vesting equity medium	-0.0012	0.0002	0.0045***	0.0011	0.0018	0.0023**
(N=3,055)	(-0.59)	(0.11)	(2.69)	(0.83)	(1.49)	(2.21)
Vesting equity high	0.0015	0.0011	0.0037***	0.0016	0.0023**	0.0026***
(N=4,291)	(0.90)	(0.78)	(2.76)	(1.60)	(2.19)	(2.94)

Panel C: Abnormal returns to open market share repurchases when the CEO sells equity simultaneously

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 1]	[2, 3]	[4, 6]	[7, 12]	[1, 12]
Full sample	0.0092***	0.0029	0.0018	0.0017	0.0015	0.0020**
(N=5,869)	(3.72)	(0.72)	(1.42)	(1.57)	(1.40)	(2.58)
CEO equity sales low	-0.0014	0.0029	0.0020	0.0013	0.0039***	0.0031***
(N=1,656)	(-0.31)	(0.60)	(0.99)	(0.68)	(2.97)	(2.92)
CEO equity sales medium	0.0146***	-0.0010	0.0013	0.0022	0.0015	0.0018**
(N=2,157)	(6.16)	(-0.43)	(0.79)	(1.54)	(1.30)	(2.27)
CEO equity sales high	0.0176***	-0.0009	0.0015	0.0009	-0.0001	0.0007
(N=2,056)	(7.19)	(-0.40)	(0.76)	(0.53)	(-0.10)	(0.65)

Panel D: Abnormal returns to CEO sales in general (not conditioning on repurchase months)

Table 7 continued

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 1]	[2, 3]	[4, 6]	[7, 12]	[1, 12]
Full sample	0.0140***	-0.0011	-0.0009	-0.0009	0.0006	0.0002
(N=20,321)	(10.50)	(-0.92)	(-0.87)	(-0.92)	(0.73)	(0.34)
CEO equity sales low	0.0064***	0.0014	0.0001	-0.0022	0.0026	0.0008
(N=6,777)	(2.75)	(0.64)	(0.06)	(-1.51)	(1.33)	(0.89)
CEO equity sales medium	0.0177***	-0.0033**	-0.0011	-0.0011	0.0002	-0.0001
(N=7,351)	(10.93)	(-2.28)	(-0.89)	(-0.94)	(0.27)	(-0.12)
CEO equity sales high	0.0199***	-0.0004	-0.0022	-0.0015	-0.0001	-0.0005
(N=6,193)	(10.50)	(-0.23)	(-1.62)	(-1.30)	(-0.06)	(-0.47)

Table 8

Share repurchases and equity compensation: repurchase prices versus market prices.

This table examines whether repurchase prices are higher or lower than market prices when repurchases coincide with the CEO's equity-based compensation. Repurchase bargain is defined as the difference between average market price in a given month and average repurchase price reported in the firm's quarterly filing, scaled by market price. The market price is the daily closing price taken from CRSP and is averaged over the current month [0,0], the following month [+1,+1], the following three months [+1,+3], or the following six months [+1,+6]. Panel A compares repurchase bargains in months without versus with CEO equity vesting. Panel B compares repurchase bargains in months without versus with CEO sales. Column (5) shows the difference between column (2) and column (4). Column (6) tests whether the difference is statistically significant using a two-sample t-test. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Repurchase bargains in months without versus with CEO *equity vesting*

	(1)	(2)	(3)	(4)	(5)	(6)
	without vesting		with vesting			
Benchmark period	N	Average bargain	N	Average bargain	(2) − (4)	t-statistic
[0, 0]	43,052	0.0080***	8,136	0.0070***	0.0010**	2.35
[+1, +1]	43,052	0.0055***	8,136	0.0105***	-0.0050***	-4.15
[+1, +3]	43,052	0.0070***	8,136	0.0160***	-0.0090***	-5.50
[+1, +6]	43,052	0.0075***	8,136	0.0175***	-0.0100***	-4.65

Panel B: Repurchase bargains in months without versus with CEO *equity sales*

	(1)	(2)	(3)	(4)	(5)	(6)
	without CEO sales		with CEO sales			
Benchmark period	N	Average bargain	N	Average bargain	(2) − (4)	t-statistic
[0, 0]	46,073	0.0080***	5,115	0.0100***	-0.0020***	-3.45
[+1, +1]	46,073	0.0055***	5,115	0.0145***	-0.0090***	-6.10
[+1, +3]	46,073	0.0075***	5,115	0.0155***	-0.0080***	-4.05
[+1, +6]	46,073	0.0080***	5,115	0.0190***	-0.0110***	-4.05

Table 9
The initiation of buyback programs and long-run shareholder value

This table reports Fama and French calendar-time portfolio regressions for various event windows following the initiation (announcement) of buyback programs. Equally-weighted calendar-time portfolios are built and rebalanced for each month between 2007 and 2019, using the initiations of 6,303 buyback programs between 2006 and 2019. During the first year, 2006, after the start of the new regulation about equity-based compensation, not all firms were immediately reporting to the new standard. Hence, in order to avoid biased portfolios at the beginning of the sample, we start the time series regressions in 2007. We regress the monthly excess return of this portfolio on the Fama-French three factors (Fama and French, 1993, Fama and French, 1996). Each included stock has an equal weight in the monthly portfolio, regardless of whether it has one or more events during the event window. For the window of [0, 0], a firm is included in this portfolio if it repurchases shares in the current month (month 0). For other windows, a firm is included if it repurchases shares within the specified range of preceding months. For instance, a firm is included in the [1, 12] portfolio if it repurchased shares between the prior month (month -1) and 12 months ago (month -12), and in the [1, 48] portfolio if it repurchased shares anytime from the prior month (month -1) up to 48 months ago (month -48). Panel B examines a subsample of buyback programs where the CEO sells equity within the first 12 months of the program. Tercile ranges for low, medium, and high are based on all non-zero values of *CEO selling* in the first 12 program months of buyback programs initiated in a given calendar year. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Long-run abnormal returns of buyback programs

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]	[1, 48]
Intercept	0.0106***	0.0029***	0.0025***	0.0016*	0.0019	0.0022**
	(5.49)	(2.99)	(2.66)	(1.78)	(1.63)	(2.36)
MktRF	0.9344***	1.0213***	1.0399***	1.0381***	1.0521***	1.0602***
	(19.69)	(42.82)	(44.76)	(46.00)	(36.89)	(45.73)
SMB	0.7064***	0.6082***	0.6050***	0.6377***	0.6169***	0.6637***
	(8.00)	(13.71)	(14.00)	(15.19)	(11.64)	(15.39)
HML	-0.0287	0.0973***	0.1814***	0.1783***	0.2520***	0.2084***
	(-0.40)	(2.67)	(5.10)	(5.17)	(5.79)	(5.88)
Observations	156	156	156	156	154	156
R^2	0.8127	0.9514	0.9563	0.9591	0.9396	0.9593

Panel B: Long-run abnormal returns of buyback programs when the CEO sells equity in the subsequent 12 months

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Equally-weighted portfolio return			
Event window:	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]	[1, 48]
Full sample	0.0166***	0.0064***	0.0018**	0.0024**	0.0020	0.0033***
(N=2,343)	(7.66)	(6.27)	(2.09)	(2.36)	(1.50)	(3.69)
12-month equity sales low	0.0175***	0.0040***	0.0014	0.0027	0.0036*	0.0029***
(N=631)	(3.02)	(2.72)	(1.07)	(1.59)	(1.82)	(2.77)
12-month equity sales medium	0.0157***	0.0060***	0.0015	0.0009	0.0001	0.0026***
(N=845)	(3.94)	(4.20)	(1.37)	(0.65)	(0.08)	(2.73)
12-month equity sales high	0.0134***	0.0090***	0.0025*	0.0037***	0.0024	0.0040***
(N=867)	(4.00)	(7.97)	(1.92)	(2.89)	(1.54)	(4.04)

D Online Appendix

OA.1 Quotes on share repurchases by media and politicians

Below, we cite commentaries linking share repurchases to stock price manipulation.

"With the majority of their compensation coming from stock options and stock awards, senior corporate executives have used open-market repurchases to manipulate their companies' stock prices to their own benefit [...]"
William Lazonick, Mustafa Erdem Sakinç, and Matt Hopkins in the Harvard Business Review, January 2020.
Retrieved from: https://hbr.org/2020/01/why-stock-buybacks-are-dangerous-for-the-economy.

"[...] there are currently no meaningful limits to stop executives from using corporate money on stock buybacks to raise share prices for their own short-term gain."
Leonore Palladino of the Roosevelt Institute in her testimony before the United States House of Representatives' Committee on Financial Services, October 2019.
Retrieved from: https://financialservices.house.gov/uploadedfiles/hhrg-116-ba16-wstate-palladinol-20191017.pdf.

"Executives might also conduct repurchases to exert upward price pressure on the stock while selling their shares, which would systematically transfer value from public investors to themselves."
Jesse M. Fried in his testimony before the United States House of Representatives' Committee on Financial Services, October 2019.
Retrieved from: https://financialservices.house.gov/uploadedfiles/hhrg-116-ba16-wstate-friedj-20191017.pdf.

"We give stock to corporate managers to convince them to create the kind of long-term value that benefits American companies and the workers and communities they serve. Instead, what we are seeing is that executives are using buybacks as a chance to cash out their

compensation at investor expense."

SEC Commissioner Robert J. Jackson Jr, March 2019.

Retrieved from: https://www.sec.gov/news/speech/speech-jackson-061118

"[...] buybacks were treated as stock manipulation for decades because that is exactly what they are," she said. "The SEC needs to recognize that."

Elizabeth Warren in the Boston Globe, June 4, 2015.

Retrieved from: https://www.bostonglobe.com/news/nation/2015/06/04/sen-elizabeth-warren-decries-stock-buybacks-and-high-ceo-pay-seeks-overturn-rules/story.html"

OA.2. Construction of repurchase data set

To date, there is no commercial database that provides detailed repurchase activity on a monthly basis or includes details on the nature of the repurchases. Hence, we resort to obtaining the repurchase data directly from the quarterly filings with the SEC. As a starting point, we use the CRSP monthly stock file to download a list of all firms available in CRSP between 2004 and 2019. We identify all ordinary shares (share code 10 and 11) that are traded on the NYSE, AMEX, and NASDAQ (exchange code 1, 2, and 3) between January 1st 2004 and December 31st 2019. If a firm (identified via PERMCO) has more than one class of ordinary shares (identified via PERMNO) on record in CRSP, we keep the PERMNO with the largest market capitalization. Then we use the linking table in the CRSP-Compustat merged database to get the CIKs for the respective firms. There are 8,459 firms in CRSP. Out of these firms, 16 are not available in Compustat and 458 firms have missing CIK data. Furthermore, we use WRDS' SEC Suite to download a list of CIKs which have been active at some point during our sample period ("historical" CIKs). We obtain 341 additional CIKs from the SEC Suite.

We feed the resulting list of 8,326 CIKs into a Python script which uses these identifiers to download firms' quarterly reports (10-K and 10-Q) from SEC's EDGAR database. In the next step, we parse through the downloaded filings in search for repurchase information under Item 2(e) of Form 10–Q or under Item 5(c) of Form 10–K. For the filings that contain repurchase information, we extract the total number of shares purchased, the average price

paid per share, the total number of shares purchased as part of publicly announced programs, and the maximum number of shares or the total dollar amount that may yet be purchased under these programs.

Besides the numerical data in the repurchase table, firms disclose detailed information on the nature of the transaction and the characteristics of repurchase programs. We write a separate Python script that performs a textual analysis of the text surrounding the repurchase table. This textual analysis identifies relevant information on the characteristics of the buyback program. For example, we identify the transaction method (open market, private negotiation, or tender offer) and, in case of a publicly announced program, the program's date of announcement, approved dollar amount of the program, and, if applicable, the expiration date. We also record whether the buyback program was fully or partially executed under SEC's rule 10b5-10, which exempts liability for insider trading if the program is executed by an independent third party.

After the automated scripts have been run, a process of manual work follows to check and supplement the automatic output. The manual work is mainly for three purposes. First, some firms did not adhere to the standard format of reporting share repurchase activity, so for those respective filings we look up the repurchase information manually. Second, since SDC Platinum is the usual data source for announcements of repurchase programs, we compare the announcement information in our dataset with that in SDC, and check the original SEC filing if there is any difference. Lastly, to avoid outliers due to errors in data collection, we manually check the highest percentiles of repurchases volume, repurchased stocks as a fraction of total shares outstanding, and repurchasing price, respectively. Any discrepancies between the original filings and the automated output were manually corrected. The manual correction ensured that we had to drop only very few observations (less than 100).

Firms sometimes announce additional buyback programs while an older program is still ongoing. Furthermore, some firms announce modifications to their ongoing programs. We treat both events as the start of a new buyback program.

Our final repurchase data set, which spans from 2004 to 2019, covers 3,803 repurchasing firms, 11,529 repurchase programs and 110,887 repurchase months between 2004 and 2019. Our final data set is matched to data from Equilar. For this project, the sample begins

in 2006 because vesting equity can be estimated with much more precision using the 2006 disclosure requirement for executive compensation. Therefore, we restrict the data set to the period between 2006 and 2019, reducing the data set to 3,556 repurchasing firms, 10,107 repurchase programs and 94,388 repurchase months left. In the final step, we remove all buybacks which have not been executed via the open market. We also exclude buybacks of firms in the financial and utility sectors, and repurchase-months of which there are missing observations for any of the control variables. We end up with our final repurchase data set of 2,377 repurchasing firms, 6,303 repurchase programs and 59,082 repurchase months.

Table OA1
The impact of the corporate calendar on share repurchases (dummy) or equity-based compensation (dummy)

The dependent variable is *Repurchase dummy* in Panel A, *Granted dummy* in Panel B, *Vesting dummy* in Panel C, and *CEO selling dummy* in Panel D. The independent variables are *Blackout ratio*, which is the fraction of blackout days within a month, dummies for the month in fiscal quarter, and dummies for the month in fiscal year. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

Panel A: Share repurchases and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Repurchase dummy		
Blackout ratio	-0.1017***			-0.1342***	-0.1728***
	(-32.95)			(-29.86)	(-31.48)
Month in fiscal quarter=2		0.0594***		-0.0314***	
		(21.60)		(-7.89)	
Month in fiscal quarter=3		0.0445***		0.0153***	
		(16.14)		(5.21)	
Month in fiscal year=2			0.0593***		-0.0126**
			(12.80)		(-2.55)
Month in fiscal year=3			0.0688***		0.0311***
			(14.51)		(6.39)
Month in fiscal year=4			0.0265***		0.0183***
			(6.18)		(4.28)
Month in fiscal year=5			0.0807***		-0.0593***
			(17.00)		(-9.22)
Month in fiscal year=6			0.0563***		0.0101**
			(11.99)		(2.04)
Month in fiscal year=7			0.0107**		0.0023
			(2.54)		(0.55)
Month in fiscal year=8			0.0721***		-0.0685***
			(15.30)		(-10.64)
Month in fiscal year=9			0.0464***		0.0006
			(9.88)		(0.11)
Month in fiscal year=10			0.0016		-0.0076*
			(0.38)		(-1.77)
Month in fiscal year=11			0.0642***		-0.0766***
			(13.44)		(-11.81)
Month in fiscal year=12			0.0458***		-0.0007
			(9.77)		(-0.14)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.2752	0.2733	0.2736	0.2757	0.2765
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel B: Granted equity and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Granted dummy		
Blackout ratio	-0.0295***			0.0720***	-0.1373***
	(-12.72)			(16.71)	(-26.40)
Month in fiscal quarter=2		0.0653***		0.1141***	
		(33.00)		(30.84)	
Month in fiscal quarter=3		0.0106***		0.0262***	
		(5.81)		(12.90)	
Month in fiscal year=2			0.1988***		0.1417***
			(45.53)		(30.95)
Month in fiscal year=3			0.0471***		0.0171***
			(12.22)		(4.29)
Month in fiscal year=4			-0.0439***		-0.0504***
			(-14.54)		(-16.65)
Month in fiscal year=5			-0.0151***		-0.1263***
			(-4.41)		(-23.23)

	(1)	(2)	(3)	(4)	(5)
Month in fiscal year=6			-0.0619***		-0.0987***
			(-19.67)		(-28.86)
Month in fiscal year=7			-0.0671***		-0.0738***
			(-23.47)		(-25.72)
Month in fiscal year=8			-0.0512***		-0.1629***
			(-15.93)		(-30.60)
Month in fiscal year=9			-0.0791***		-0.1155***
			(-26.56)		(-35.43)
Month in fiscal year=10			-0.0801***		-0.0875***
			(-28.19)		(-30.66)
Month in fiscal year=11			-0.0607***		-0.1726***
			(-19.05)		(-32.44)
Month in fiscal year=12			-0.0542***		-0.0911***
			(-16.80)		(-25.89)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0538	0.0580	0.1006	0.0598	0.1052
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel C: Vesting equity and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			Vesting dummy		
Blackout ratio	-0.0300***			0.1095***	-0.1539***
	(-10.06)			(21.51)	(-26.32)
Month in fiscal quarter=2		0.0835***		0.1575***	
		(32.07)		(35.72)	
Month in fiscal quarter=3		0.0165***		0.0403***	
		(6.68)		(15.10)	
Month in fiscal year=2			0.2346***		0.1706***
			(46.16)		(31.14)
Month in fiscal year=3			0.0818***		0.0482***
			(16.76)		(9.63)
Month in fiscal year=4			-0.0631***		-0.0704***
			(-15.19)		(-16.90)
Month in fiscal year=5			-0.0174***		-0.1420***
			(-3.79)		(-21.65)
Month in fiscal year=6			-0.1002***		-0.1413***
			(-23.46)		(-31.33)
Month in fiscal year=7			-0.1039***		-0.1114***
			(-26.31)		(-28.10)
Month in fiscal year=8			-0.0781***		-0.2032***
			(-17.93)		(-31.66)
Month in fiscal year=9			-0.1322***		-0.1730***
			(-32.37)		(-39.92)
Month in fiscal year=10			-0.1407***		-0.1489***
			(-35.80)		(-37.79)
Month in fiscal year=11			-0.1112***		-0.2365***
			(-25.95)		(-37.13)
Month in fiscal year=12			-0.0900***		-0.1313***
			(-20.95)		(-28.81)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.1104	0.1143	0.1592	0.1165	0.1624
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Panel D: CEO sales and the corporate calendar

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			CEO selling dummy		
Blackout ratio	-0.0668***			-0.0772***	-0.1123***
	(-30.77)			(-24.49)	(-28.13)

	(1)	(2)	(3)	(4)	(5)
Month in fiscal quarter=2		0.0396***		-0.0126***	
		(21.18)		(-4.67)	
Month in fiscal quarter=3		0.0096***		-0.0072***	
		(5.45)		(-3.80)	
Month in fiscal year=2			0.0473***		0.0006
			(14.61)		(0.18)
Month in fiscal year=3			0.0250***		0.0005
			(7.90)		(0.15)
Month in fiscal year=4			0.0045		-0.0008
			(1.63)		(-0.29)
Month in fiscal year=5			0.0425***		-0.0484***
			(13.12)		(-10.73)
Month in fiscal year=6			0.0084***		-0.0217***
			(2.82)		(-6.86)
Month in fiscal year=7			0.0042		-0.0013
			(1.55)		(-0.48)
Month in fiscal year=8			0.0402***		-0.0511***
			(12.53)		(-11.35)
Month in fiscal year=9			0.0074**		-0.0224***
			(2.49)		(-7.13)
Month in fiscal year=10			0.0041		-0.0019
			(1.49)		(-0.70)
Month in fiscal year=11			0.0413***		-0.0502***
			(12.78)		(-11.06)
Month in fiscal year=12			0.0106***		-0.0196***
			(3.60)		(-6.26)
Observations	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.1636	0.1618	0.1619	0.1637	0.1649
Year-month FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

Table OA2
The corporate calendar and the correlation between share repurchases (ln) and equity-based compensation

This table presents OLS regressions of the logarithmic values of *Repurchase intensity* on the granting, vesting, and selling of equity, and controls for the corporate calendar. The columns with uneven numbers show the regressions without controls for the corporate calendar and the columns with even numbers with controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. The estimates for these controls are qualitatively similar to those reported. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. The difference between the equity-based compensation coefficients of the specification without corporate calendar controls and the specification with corporate calendar controls is tested using a two-sample t-test. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Repurchase intensity (ln)			
Granted equity (ln)	0.0086***	0.0022				
	(5.80)	(1.45)				
Vesting equity (ln)			0.0088***	0.0019		
			(6.15)	(1.31)		
CEO selling (ln)					0.0002	-0.0030***
					(0.15)	(-2.95)
Blackout ratio		-0.1179***		-0.1179***		-0.1189***
		(-33.73)		(-33.73)		(-34.14)
Observations	251,642	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.2562	0.2645	0.2562	0.2645	0.2561	0.2645
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1)	-4.2663***	(4)-(3):	-4.7894***	(6)-(5):	-2.6987**

Table OA3
Correlation between share repurchases and equity-based compensation using only one of the corporate calendar controls

This table presents OLS regressions of *Repurchase intensity* on the granting, vesting, and selling of equity, and controls for the corporate calendar. The columns with uneven numbers show the regressions with only the control variable *Blackout ratio* included. The columns with even numbers show the regressions only dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. The estimates for these controls are qualitatively similar to those reported. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Repurchase intensity			
Granted equity (ln)	0.0061*	0.0080**				
	(1.92)	(2.46)				
Vesting equity (ln)			0.0066**	0.0082***		
			(2.15)	(2.67)		
CEO selling (ln)					-0.0095***	-0.0071***
					(-4.33)	(-3.25)
Blackout ratio	-0.1573***		-0.1573***		-0.1587***	
	(-30.03)		(-30.03)		(-30.23)	
Observations	251,642	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.1335	0.1318	0.1335	0.1318	0.1335	0.1318
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes

Table OA4

The corporate calendar and the correlation between share repurchases and equity-based compensation using lagged *Blackout ratio*

This table presents OLS regressions of the logarithmic values of *Repurchase intensity* on the granting, vesting, and selling of equity, and controls for the corporate calendar. The columns with uneven numbers show the regressions without controls for the corporate calendar and the columns with even numbers with controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio* lagged by 36 months, and dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. The estimates for these controls are qualitatively similar to those reported. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. The difference between the equity-based compensation coefficients of the specification without corporate calendar controls and the specification with corporate calendar controls is tested using a two-sample t-test. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Repurchase intensity			
Granted equity (ln)	0.0105***	0.0021				
	(3.27)	(0.57)				
Vesting equity (ln)			0.0112***	0.0026		
			(3.66)	(0.82)		
CEO selling (ln)					-0.0047**	-0.0097***
					(-2.16)	(-3.82)
Blackout ratio$_{t-36}$		-0.1440***		-0.1438***		-0.1457***
		(-15.97)		(-15.97)		(-16.20)
Observations	251,642	197,314	251,642	197,314	251,642	197,314
Adjusted R^2	0.1292	0.1463	0.1292	0.1463	0.1291	0.1463
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1):	-2.4307**	(4)-(3):	-2.7600***	(6)-(5):	-2.1200**

Table OA5

The corporate calendar and the correlation between share repurchases and equity-based compensation on the annual level

This table presents OLS regressions of *Repurchase intensity* on the granting, vesting, and selling of equity, and controls for the corporate calendar on the fiscal-year level. The columns with uneven numbers show the regressions without controlling for the corporate calendar and the columns with even numbers show the regressions with the control variable *Blackout ratio*. We include the standard controls which are described in Table A1 throughout all specifications. Year fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Repurchase intensity			
Granted equity (ln)	0.0020	0.0013				
	(0.51)	(0.33)				
Vesting equity (ln)			-0.0034	-0.0041		
			(-0.91)	(-1.08)		
CEO selling (ln)					-0.0029	-0.0031*
					(-1.53)	(-1.67)
Blackout ratio		-0.2798***		-0.2819***		-0.2823***
		(-5.39)		(-5.48)		(-5.47)
Observations	20,999	20,999	20,999	20,999	20,999	20,999
Adjusted R^2	0.2610	0.2625	0.2611	0.2625	0.2611	0.2626
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

Table OA6
Flexible and preset repurchases and equity-based compensation

This table presents the relationship between actual monthly share repurchases and equity based compensation for two sub-samples. The first sample is restricted to flexible programs (not pursuant to SEC's Rule 10b5-1) in columns (1) to (3) and the second sample is restricted to preset programs (pursuant to SEC's Rule 10b5-1) in columns (4) to (6). The dependent variable is *Repurchase intensity*. We include the standard controls which are described in Table A1 throughout all specifications. The estimates for these controls are qualitatively similar to those reported. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Program type:		Flexible Programs			Preset (10b5-1) Programs	
Dependent variable:			Repurchase intensity			
Granted equity (ln)	0.0158***			-0.0002		
	(3.16)			(-0.02)		
Vesting equity (ln)		0.0138***			0.0131	
		(3.10)			(1.31)	
CEO selling (ln)			-0.0052			-0.0200***
			(-1.42)			(-2.84)
Observations	112,064	112,064	112,064	25,159	25,159	25,159
Adjusted R^2	0.1456	0.1456	0.1456	0.1942	0.1943	0.1944
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	No	No	No	No	No

Table OA7

Repurchases outside a program and equity-based compensation

This table presents the relationship between actual monthly share repurchases that were conducted outside of a repurchase program and equity-based compensation. These repurchases are (mostly) made to satisfy obligations from compensation schedules. The dependent variable is Repurchase intensity (non-program). The relationships between granted equity and share repurchases, vesting equity and share repurchases, and CEO sales and share repurchases are examined, respectively. The columns with uneven numbers show the regressions without controls for the corporate calendar and the columns with even numbers with controls for the corporate calendar. The controls for the corporate calendar are *Blackout ratio*, which is the fraction of blackout days within a month, and dummies for the month in fiscal year. We include the standard controls which are described in Table A1 throughout all specifications. The estimates for these controls are qualitatively similar to those reported. Year-month fixed effects and firm fixed effects are controlled for throughout all specifications in this table. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. The difference between the equity based compensation-coefficients of two specifications is tested using a t-stat and reported below the table. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Table 1.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Repurchase intensity outside a program					
Granted equity (ln)	0.0087***	0.0070***				
	(4.20)	(3.23)				
Vesting equity (ln)			0.0122***	0.0105***		
			(7.05)	(5.96)		
CEO selling (ln)					0.0006	0.0001
					(0.50)	(0.11)
Blackout ratio		-0.0219***		-0.0210***		-0.0235***
		(-4.04)		(-3.90)		(-4.29)
Observations	251,642	251,642	251,642	251,642	251,642	251,642
Adjusted R^2	0.0253	0.0254	0.0254	0.0255	0.0252	0.0253
Standard controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Fiscal month FE	No	Yes	No	Yes	No	Yes
T-stat of the difference	(2)-(1):	-0.8019	(4)-(3):	-0.9735	(6)-(5):	-0.4696

Table OA8
Replication and robustness of Table 3, Panel A, in Edmans et al. (2022)

This table reports the results of replication and robustness tests of Table 3, Panel A, in Edmans et al. (2022). We calculate BHARs as compounded monthly returns over various time periods (from two months before to four years after the current month), subtracting the compounded monthly value-weighted market returns. Panel A replicates Edmans et al. (2022), where the sample is repurchasing months and the regressor, *Vesting equity in billions*, is the value of equity being vested to the CEO in the current month measured in billions of US dollars. In Panel B, the regressor is also *Vesting equity in billions*, but the sample is non-repurchasing months. In Panel C, the sample is repurchasing months, and the regressor is *Vesting dummy*. *Vesting dummy* equals one if some of the CEO's equity is vested in the current month and zero otherwise. In Panel D, the sample is repurchasing months, and the regressor is *Vesting number*. *Vesting number* is the number of shares being vested to the CEO in the current month. The year-month fixed effect and firm fixed effect are controlled for throughout all specifications. T-statistics, adjusted for clustering at the firm level, are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: CEO equity vesting and abnormal returns in repurchasing months

Dependent variable: BHAR over	[-2, -2]	[-1, -1]	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Vesting equity in billions	0.3788	0.5385**	0.1306	-2.5859***	-2.0838**	-2.7786***	-2.5150**
	(1.59)	(2.01)	(0.51)	(-2.62)	(-2.11)	(-2.82)	(-2.50)
Observations	58,506	58,773	58,975	50,335	49,633	48,929	48,369
Adjusted R^2	0.0471	0.0475	0.0419	0.2466	0.2636	0.2671	0.2708

Panel B: CEO equity vesting and abnormal returns in non-repurchasing months

Dependent variable: BHAR over	[-2, -2]	[-1, -1]	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Vesting equity in billions	1.0575***	0.7086***	-0.1736	-9.7920***	-9.4207***	-9.1148***	-9.2824***
	(4.32)	(2.81)	(-0.69)	(-8.51)	(-8.13)	(-7.89)	(-8.01)
Observations	189,297	190,895	192,560	163,223	161,166	159,125	156,961
Adjusted R^2	0.0368	0.0370	0.0371	0.1373	0.1389	0.1402	0.1422

Panel C: CEO equity vesting dummy and abnormal returns in repurchasing months

Dependent variable: BHAR over	[-2, -2]	[-1, -1]	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Vesting dummy	0.0011	-0.0002	0.0027**	0.0021	0.0047	0.0030	0.0034
	(1.05)	(-0.16)	(2.46)	(0.49)	(1.06)	(0.66)	(0.71)
Observations	58,506	58,773	58,975	50,335	49,633	48,929	48,369
Adjusted R^2	0.0471	0.0474	0.0420	0.2466	0.2636	0.2670	0.2708

Panel D: CEO equity vesting number and abnormal returns in repurchasing months

Dependent variable: BHAR over	[-2, -2]	[-1, -1]	[0, 0]	[1, 12]	[13, 24]	[25, 36]	[37, 48]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)

Table OA8 continued

Vesting number	-0.0012	0.0104	0.0233***	0.0502*	0.0660**	0.0508*	0.0737**
	(-0.17)	(1.36)	(2.93)	(1.80)	(2.38)	(1.84)	(2.52)
Observations	57,718	57,978	58,170	49,663	48,970	48,272	47,715
Adjusted R^2	0.0480	0.0482	0.0386	0.2437	0.2606	0.2631	0.2665