

Trading Constraints, Retail Speculation, and Option Market Quality: Evidence from the Pattern Day Trader Rule

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Abstract

We exploit the repeal of the Pattern Day Trader rule to examine how relaxing day-trading constraints affects retail option trading and option market quality. Following the repeal, retail option trades increase by 14%–24% and retail option dollar volume increases by 17%–19% in securities with high pre-repeal retail participation. The increase is concentrated in short-maturity contracts, particularly out-of-the-money zero-days-to-expiration options, consistent with regulatory concerns that relaxing trading constraints encourages retail speculation. However, option bid-ask spreads narrow following the repeal, consistent with speculative retail activity improving, rather than impairing, option market quality.

Keywords: Pattern day trading; retail trading; retail investors; option trading; retail speculation; market quality

1. Introduction

On September 28, 2001, FINRA and the SEC implemented the Pattern Day Trader (PDT) rule in response to concerns about substantial losses incurred by retail investors engaged in margin-based day trading following the collapse of the internet bubble. The rule required investors executing four or more day trades within a five-business-day period to maintain at least \$25,000 in account equity. Critics argued that the rule disproportionately restricted smaller investors, imposed an arbitrary threshold that was never adjusted for inflation, focused on trading frequency rather than overall portfolio risk, and potentially reduced retail liquidity. On April 14, 2026, the SEC approved the elimination of the PDT rule. Shares of *Robinhood* and *Webull*, brokerages with substantial exposure to retail investors affected by the rule, surged following the announcement, while retail investors on *Reddit's WallStreetBets* celebrated the decision.¹

In this paper, we examine the consequences of eliminating the PDT rule for retail option trading and option market quality. We focus on the option market for several reasons. Retail investors account for a substantial fraction of option market activity, and the leverage embedded in options makes them a natural vehicle for speculative trading.² Anecdotal evidence surrounding the repeal also frequently emphasizes option rather than equity trading, with retail investors commonly discussing the implications of the rule change for short-dated options (see Appendix A). Finally, the rich cross-section of option contracts allows us to compare trading in more and less speculative contracts on the same underlying security at the same point in time. This feature allows us to examine not only how much relaxing trading constraints increases retail activity, but also whether the additional activity is concentrated in particularly speculative contracts.

¹ Appendix A provides several examples of Reddit posts regarding the PDT repeal. As one poster commented, ‘Clearly the PDT rule held me back...as the title suggests. Letting my true regarded self trade uncontrolled, I managed to 10x my account in 4 days through mostly 0DTE SPY puts and calls.’

² We estimate that retail investors account for 56.6% of option trades, compared with 12.9% of equity trades.

We address three main questions. First, to what extent does removing the PDT constraint increase retail option trading? While eliminating a binding trading constraint should increase trading, the magnitude of the response depends on how many retail investors were meaningfully constrained by the rule. Second, is the response concentrated in short-maturity options, particularly out-of-the-money zero-days-to-expiration (0DTE) options? This distinction is important because the PDT rule was motivated in part by concerns about speculative trading and substantial losses among less sophisticated retail investors. Finally, how does the repeal affect option market quality, as reflected in bid-ask spreads? The effect is theoretically ambiguous. While uninformed retail trading can improve liquidity by reducing adverse selection, correlated or speculative retail trading can increase inventory risk for liquidity providers and impair market quality. Thus, although relaxing the PDT constraint may increase speculative retail trading, its implications for market quality are unclear *ex ante*.

To address these questions, we exploit the elimination of the PDT rule in a difference-in-differences framework that compares changes in option trading and market quality across securities with different exposure to retail investors. Our baseline measure of exposure is retail option dollar volume during March 2026, before our estimation period begins, with securities in the top 5% of the distribution classified as high-retail. We also consider a broader top-20% classification and an alternative, time-varying measure of retail exposure based on activity *Reddit's* investment forums.

We first find that eliminating the PDT constraint leads to a substantial increase in retail option trading. In our baseline specification, retail option trades increase by 24% and retail option dollar volume increases by 19% for high-retail securities relative to other securities following the repeal. The results are similar using the broader top-20% classification and our alternative measure of retail exposure based on *Reddit* social media activity. Event-study estimates show little evidence of differential trends prior to the repeal and a sharp increase in retail option trading following its implementation.

Our second finding concerns the types of options that account for the increase in retail trading. Sorting contracts by maturity, we find that the increase in retail option trading is concentrated in short-dated options. Retail option trades increase by 31% for 0DTE contracts and 22% for contracts with one to seven days to expiration, while the increases are economically small and statistically insignificant for contracts with maturities greater than one week. Sorting contracts by moneyness, we find that the increase in retail trading is more than 50% as large for out-of-the-money as for in-the-money options. Finally, jointly sorting contracts by maturity and moneyness reveals that the response is particularly pronounced for out-of-the-money 0DTE options, with retail trading in these contracts increasing by 46%. Collectively, these findings suggest that relaxing the PDT constraint disproportionately increases trading in the types of option contracts most associated with speculative retail trading.

Our third finding is that option market quality improves following the repeal. In our baseline specification, quoted spreads decline by 0.89% and effective spreads decline by 0.29% for high-retail securities relative to other securities. Notably, the decline in quoted spreads is largest for out-of-the-money 0DTE options, where quoted spreads decline by 4.38 %. Overall, these findings indicate that the increase in speculative retail trading following the repeal is accompanied by improved, rather than impaired, option market liquidity. This pattern is consistent with the additional retail activity largely representing relatively uninformed order flow, which reduces adverse-selection risk for liquidity providers and allows them to quote tighter spreads.

Our paper first contributes to the broad literature on retail investor trading. A vast literature documents that individual investors trade frequently, exhibit behavioral biases, and are attracted to salient and lottery-like securities (Barber and Odean, 2000, 2001, 2008; Kumar, 2009; Barber, Odean, and Zhu, 2009). More recent work examines how technological innovation, social media, and changes in the retail brokerage environment have altered retail participation and its effects on financial markets (Farrell, Green, Jame, and Markov, 2022; Barber, Huang, Odean, and Schwarz, 2022; Bradley,

Hanousek Jr. , Jame, and Xiao, 2024). Most closely related, Heimer and Simsek (2019) examine a regulatory restriction on leverage in retail foreign exchange markets and show that imposing the constraint reduces speculative trading. We complement their analysis by studying the removal of a trading-frequency constraint in the U.S. option market. The richness of option contracts allows us to show not only that relaxing the constraint increases retail trading, but also that the additional activity is disproportionately concentrated in short-dated, out-of-the-money options. Thus, our findings provide new evidence on how trading constraints shape both the amount and the composition of speculative retail trading.

Second, our paper contributes to the rapidly growing literature on retail participation in options markets. Recent studies document the dramatic growth of retail options trading and show that retail investors disproportionately trade inexpensive, short-dated, and out-of-the-money contracts (Bryzgalova, Pavlova, and Sikorskaya, 2023; de Silva, Smith, and So, 2026; Eaton, Green, Roseman, and Wu, 2026). Other work examines the consequences of this activity for option prices and investor outcomes, as well as the role of investment advice in stimulating retail option trading (Green, Jame, Oliphant, and Roseman, 2026). We contribute to this literature by identifying trading constraints as an important determinant of speculative retail option activity. Although the PDT rule does not specifically target options, its repeal generates a substantial increase in retail option trading, particularly in contracts commonly associated with retail speculation. Our findings therefore suggest that the growth of speculative retail option trading reflects not only investor preferences and technological changes, but also the institutional constraints governing investors' ability to trade.

Third, our paper contributes to the literature examining how retail and noise trading affect market liquidity. Theory offers competing predictions. Uninformed retail trading can improve liquidity by reducing the adverse-selection risk faced by liquidity providers, while correlated speculative trading can increase inventory risk and impair market quality. Consistent with these competing channels, prior

empirical evidence is mixed (Foucault, Sraer, and Thesmar, 2011; Peress and Schmidt, 2020; Eaton, Green, Roseman, and Wu, 2022). We contribute to this literature by studying a regulatory shock that generates a substantial increase in retail option trading, disproportionately in highly speculative contracts. Despite the speculative nature of the additional activity, option liquidity improves following the repeal, with both quoted and effective spreads declining. Our findings therefore provide evidence that an increase in speculative retail trading need not impair market quality and, in our setting, is associated with improved liquidity.

2. Institutional background and hypothesis development

2.1 The Pattern Day Trader Rule

For more than two decades, U.S. retail investors who engaged in frequent intraday trading in margin accounts were subject to special requirements under Financial Industry Regulatory Authority (FINRA) Rule 4210. The requirements were adopted in 2001 following the rapid expansion of retail day trading during the late-1990s internet boom. Their stated purpose was to address the risks associated with leveraged day trading to customers, broker-dealers, and financial markets. Under the rule, a day trade generally consisted of purchasing and selling, or selling and purchasing, the same security within the same trading day in a margin account. A margin account was generally designated as a “pattern day trader” (PDT) account after executing four or more day trades within five business days. FINRA Rule 4210 also permitted a broker to apply the PDT designation to an account when it had a reasonable basis to believe that the customer intended to engage in pattern day trading. The designation applied at the account level rather than the investor level, so an investor with multiple brokerage accounts could have the PDT designation applied to one account but not another.

PDT designation imposed a discrete capital requirement on the affected account. A PDT-designated margin account was required to maintain at least \$25,000 of equity for the investor to

continue unrestricted day trading in that account. The requirement applied separately to each account and could be satisfied with cash or eligible securities. If account equity fell below \$25,000, the investor could not continue unrestricted day trading in that account until sufficient capital was deposited to restore the balance above the threshold.³

Importantly for our setting, the rule applied to securities rather than only common stocks. The SEC's investor guidance explicitly noted that the definition of a day trade encompassed options. Thus, within a margin account, an investor with less than \$25,000 who bought and sold a stock intraday could consume one of the permitted day trades, but so could an investor who opened and closed an option position during the same session. The regulation therefore directly constrained frequent intraday option trading in margin accounts subject to the rule.

The economic significance of the restriction increased as other barriers to frequent retail trading disappeared as time progressed. Brokerage commissions fell to essentially zero, mobile trading platforms proliferated, fractional-share trading expanded, settlement shortened, and retail investors gained access to increasingly sophisticated trading products. FINRA concluded that one of the original rationales for PDT, that repeated commissions would substantially erode the wealth of customers who traded excessively, had largely disappeared with zero-commission trading. At the same time, retail participation in short-horizon derivatives, particularly options approaching expiration, increased substantially. The result was an unusual regulatory structure: a margin account with less than \$25,000 of equity could face a binding restriction on the frequency with which positions could be opened and closed intraday, whereas an otherwise identical account with slightly more than \$25,000 of equity did not. Further, this \$25,000 threshold was constant and not adjusted for inflation.

³ Cash accounts were not subject to the PDT rule. Investors could day trade in cash accounts but were constrained by settlement requirements governing when proceeds could be reused for subsequent trades.

2.2 Reform of the PDT Rule

In October 2024, FINRA initiated a retrospective review of its day-trading regulations, explicitly asking whether the definition of a pattern day trader, the number of permissible day trades, and the \$25,000 minimum-equity requirement remained appropriate.⁴ FINRA noted that markets had changed substantially since the rule's adoption, citing the reasons noted above. Following this review, FINRA proposed replacing the PDT framework with a risk-based intraday margin regime. The SEC approved the proposal on April 14, 2026. FINRA subsequently established June 4, 2026 as the effective date, while allowing member firms requiring additional implementation time to phase in the new framework through October 20, 2027.⁵

The reform eliminates both the PDT designation and the associated \$25,000 minimum-equity requirement. It also replaces the previous day-trading buying-power framework with a risk-based intraday margin regime under which broker-dealers evaluate intraday exposure within customer margin accounts. Importantly for our setting, the reform eliminates the discrete restriction that previously limited the frequency of day trading in accounts with less than \$25,000 of equity.

The distinction between the regimes is economically important. Rather than imposing a discrete restriction on frequent intraday trading based on account equity and trading frequency, the new regime eliminates the \$25,000 threshold and relies instead on risk-based intraday margin requirements. FINRA explicitly predicted that eliminating the \$25,000 threshold would give retail investors greater freedom to participate in securities markets. The SEC similarly concluded that

⁴ See: <https://www.finra.org/rules-guidance/notices/26-10>.

⁵ Although FINRA's amended rule became effective on June 4, 2026, some broker-dealers implemented the new regime several trading days later. We use June 4 as the treatment date because it represents the regulatory effective date and the date on which several major retail brokerages implemented the reform. To the extent that customers of brokerages implementing the reform after June 4 remain in our treated sample before their broker's implementation date, this treatment misclassification should attenuate estimated effects.

removing the requirement would “enhance access” by eliminating a financial barrier faced by investors with limited capital.

The reform generated sharply contrasting views about its likely consequences. Supporters, including retail investors as well as the CBOE, Charles Schwab, Robinhood, the Securities Industry and Financial Markets Association, the Security Traders Association, and other market participants argued that the \$25,000 requirement was an arbitrary wealth threshold rather than a measure of actual trading risk. Some further argued that the old rule could perversely increase risk by discouraging investors from closing losing positions after they had exhausted their available day trades, thereby inducing them to hold positions overnight. Others emphasized that modern brokerage technology permits risk to be monitored directly and in real time. The SEC characterized the comments it received as overwhelmingly supportive of replacing the existing regime.⁶

Opponents emphasized the investor-protection rationale for limiting frequent speculative trading. The North American Securities Administrators Association (NASAA), for example, argued that many of the concerns motivating the original rule remain relevant and that zero-commission trading, social-media “influencers,” and the entry of younger and less experienced investors may have increased rather than decreased the need for regulatory guardrails. NASAA also questioned whether allowing broker-dealers greater discretion in implementing intraday controls adequately protects small investors. These concerns were echoed in the popular press. Reuters described the reform as potentially opening the door to additional high-risk “YOLO” trading by smaller investors, while contemporaneous coverage emphasized that removing the \$25,000 threshold could materially expand the population able to trade actively.⁷ Market participants anticipated economically meaningful effects.

⁶ See: <chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://www.sec.gov/comments/sr-finra-2025-017/srfinra2025017-729267-2273314.pdf>

⁷ See: <https://www.reuters.com/legal/government/relaxation-us-day-trading-rules-opens-door-yolo-trading-higher-risk-2026-04-16/>

Following SEC approval, shares of retail-oriented brokerage firms Robinhood and Webull increased sharply, consistent with investor expectations that relaxed restrictions would increase active retail trading.⁸

2.3 Hypothesis development

The most direct implication of the reform concerns retail trading intensity. Before the reform, margin accounts with less than \$25,000 faced a discrete constraint after three qualifying day trades within five business days. Eliminating the PDT designation removes the constraint on the frequency with which investors with less than \$25,000 can engage in day trading. We therefore expect retail trading to increase following the relaxation of the PDT restriction. However, the magnitude of the response depends on how many retail investors were meaningfully constrained by the rule. In particular, we expect the increase to be larger in securities with greater retail participation prior to the reform (Barber and Odean, 2008; Da et al., 2011; Barber et al., 2022).

The effect of relaxing the PDT constraint may also vary substantially across option contracts. We expect the response to be stronger for shorter-maturity options, particularly 0DTE options, for several reasons. First, investors engaged in frequent day trading may be particularly attracted to speculative contracts that provide substantial exposure to short-term movements in the underlying security. Second, shorter-maturity options generally have lower dollar premiums, making them particularly accessible to smaller investors who were most likely to be constrained by the \$25,000 account-equity requirement. Third, intraday trading is likely to be more prevalent in shorter-maturity options, making the PDT restriction particularly relevant for trading in these contracts. Similar considerations suggest that the response should be stronger for out-of-the-money options, which tend

⁸ See <https://www.reuters.com/sustainability/boards-policy-regulation/robinhood-webull-jump-after-us-sec-approves-removal-day-trading-limit-smaller-2026-04-15/>

to have lower dollar premiums and provide lottery-like payoffs that are attractive to speculative retail investors. We therefore predict that the increase in retail option trading following the repeal will be stronger for shorter-maturity and out-of-the-money options.

The implications of the PDT repeal for option market quality are less clear *ex ante*. On the one hand, additional retail trading could improve liquidity by reducing adverse-selection risk. If the marginal retail trades induced by the repeal are relatively uninformed, the additional noise trading makes aggregate order flow less informative, reducing the risk that liquidity providers trade against better-informed investors. Under this view, increased retail participation following the reform could reduce quoted and effective spreads.

On the other hand, additional retail trading could impair market quality if the marginal trades induced by the reform are highly correlated or generate substantial liquidity demand. Eliminating the \$25,000 threshold allows smaller investors to trade more frequently, potentially increasing the inventory and hedging costs borne by liquidity providers. These effects may be particularly important in options markets. Bryzgalova, Pavlova, and Sikorskaya (2023) document that retail investors disproportionately trade inexpensive, short-maturity options and characterize much of this activity as speculative. Eaton, Green, Roseman, and Wu (2026) show that retail investors are net purchasers of short-dated options and that exogenous reductions in retail trading during brokerage outages reduce implied volatility, with the largest effects among contracts typically purchased by retail investors. Because market makers cannot perfectly hedge the resulting option positions, increases in retail demand can generate inventory and hedging costs that may be reflected in option liquidity. Under this view, increased retail trading following the PDT reform could widen bid-ask spreads. Thus, the net effect of the PDT reform on option market quality is theoretically ambiguous.

3. Data and sample statistics

We employ several data sources. Options trade and quote data come from the Options Price Reporting Authority (OPRA) and are used to measure retail option trading activity and execution quality. We obtain underlying stock prices from the NYSE Daily Trades and Quotes (TAQ) files, which we use to measure option moneyness. Both OPRA and TAQ data span March 2026 through August 2026. March 2026 serves as an out-of-sample month used only to construct the sample and define filters. It is excluded from the analysis itself. The pre-repeal period runs from April 1 through June 4, 2026, and the post-repeal period runs from June 5 through August 31, 2026.

Security classifications are obtained from the Center for Research in Security Prices (CRSP) and the Chicago Board Options Exchange (CBOE), which we use to identify options on individual stocks, ETFs, and indexes. Finally, daily ticker mention counts on social media are obtained from Reddit.

The options sample is constructed from OPRA trade and quote files. We match each option trade to the prevailing NBBO quote at the time of the trade and proxy for retail trades using the BPS measure (Bryzgalova et al., 2023). We measure option market liquidity using quoted and effective percentage spreads. The quoted percentage spread is the difference between the prevailing ask and bid prices divided by the quote midpoint. The effective percentage spread is twice the signed difference between the transaction price and the prevailing quote midpoint, divided by the quote midpoint, where trades are signed from the customer's perspective as described below. To compute moneyness, we match each option trade to the price of its underlying security at the time of the trade. We define moneyness as the percentage distance between the underlying price and the strike, signed so that positive values are in the money for both calls and puts. Index options with multiple listing series are pooled under their common underlying. For example, SPXW is combined with SPX.

We retain only trades with valid associated quotes, requiring both the bid and ask to be positive and the bid to be strictly below the ask. We also require the trade price to be at or within the quoted bid and ask. We exclude LEAPS from the sample by requiring options to have fewer than 365 days to expiration. We also require options to be reasonably liquid, with at least 500 trades on at least 75% of days over the filtering period.

Each trade is signed from the customer's perspective following Grauer et al. (2023). If the quoted sizes at the bid and ask are equal, we apply the quote rule, classifying the trade as a buy if the price is above the midpoint and a sell if below. Otherwise, we apply a size rule, classifying the trade as buyer-initiated (seller-initiated) if the price is closer to the ask (bid) than to the bid (ask). We then aggregate option trading activity and liquidity measures across contracts on the same underlying security to construct daily measures at the underlying security-day level. Retail and total trade counts and dollar volume are summed across contracts, while quoted and effective spreads are equally-weighted averages across trades.

Insert Table 1

Table 1 presents descriptive statistics for our option sample, which contains 34,639 underlying security-day observations representing 387 underlying securities. Average daily option dollar volume is \$53.9 million per underlying security, of which \$15.6 million is attributable to retail investors. The average underlying security-day contains 18,999 option trades, including 12,725 trades classified as retail. Thus, retail investors account for 28.3% of option dollar volume and 56.6% of option trades. The substantially larger retail share of trades than dollar volume indicates that retail option transactions tend to be considerably smaller than non-retail transactions. The average option price is \$5.51, while the average price of the underlying security is \$179.73. Quoted and effective percentage spreads average 18.0% and 3.6%, respectively.

4. The Effect of the PDT Repeal on Retail Option Trading

4.1 Baseline Results

The first question we address is whether the repeal of the PDT rule increased retail option trading. Our main empirical approach uses a difference-in-differences framework. The first difference compares option trading activity before and after the repeal, while the second exploits cross-sectional variation in underlying securities' exposure to retail option trading prior to our estimation period. In our baseline analysis, we measure this exposure using retail option dollar volume during March 2026 and classify underlying securities in the top 5% of the distribution as high retail intensity (HIRT) securities. Because the PDT rule directly constrained retail investors, we expect the repeal to have a larger effect on option trading in HIRT securities. Formally, our specification can be written as:

$$Y_{it} = \beta(Post_t \times HIRT_i) + \mu_i + \tau_t + \varepsilon_{it} \quad (1)$$

where $Post_t$ is an indicator equal to one if the period is post-PDT repeal (June 5, 2026 on) and $HIRT_i$ is an indicator equal to one for high-retail-intensity securities. The terms μ_i and τ_t represent underlying-security fixed effects and day fixed effects, respectively. The main effects of $HIRT_i$ and $Post_t$ are absorbed by the underlying-security and day fixed effects, respectively. The coefficient of interest, β , captures the differential change in option trading following the repeal for securities with high pre-repeal retail participation.

Insert Table 2

Table 2 presents the results. Using our baseline definition of HIRT, retail option trades increase by 23.5% and retail option dollar volume increases by 19.4% for HIRT securities relative to other securities following the repeal. Both effects are statistically significant. Retail trade share also increases by 2.4%, relative to a sample mean of 56.6%, while retail dollar-volume share increases by 2.0%, relative to a sample mean of 28.3%. The former is statistically significant at the 1% level and the latter at the 10% level. Collectively, these results indicate that the repeal generated a substantial

increase in both the level of retail option trading activity and retail investors' share of option trading among securities with particularly high retail participation prior to the repeal.

We next consider a broader definition of HIRT that classifies securities in the top 20% of March retail option dollar volume as high retail intensity. Using this threshold, retail option trades increase by 13.8% and retail option dollar volume increases by 17.0%, with both estimates statistically significant at the 1% level. The coefficients on retail trade share and retail dollar-volume share are positive but statistically insignificant. Overall, the effects are stronger when we use the more restrictive top-5% threshold, consistent with the effects of the repeal being concentrated in options on securities most heavily traded by retail investors.

4.2 Event-Time Analysis

We next examine the dynamics of the retail trading response around the PDT repeal. The event-time analysis serves several purposes. First, the pre-repeal estimates allow us to assess the parallel-trends assumption underlying our difference-in-differences design. Second, the post-repeal estimates allow us to examine how quickly retail trading responds to the removal of the PDT constraint. Finally, the estimates allow us to assess whether the increase in retail trading is temporary or persists throughout the post-repeal period. We estimate event-time versions of Equation (1) for retail option trades and retail option dollar volume using our baseline top-5% definition of HIRT. Specifically, we replace the $\text{Post} \times \text{HIRT}$ interaction with interactions between HIRT and a series of event-time indicators. Event periods -5 and earlier are combined and serve as the omitted reference period. Figure 1 plots the resulting coefficients for event periods -4 through $+4$, along with 95% confidence intervals.

Insert Figure 1

Figure 1 shows similar dynamics for retail option trades and retail option dollar volume. Prior to the repeal, the coefficients for both measures are statistically insignificant and exhibit no systematic trend. Following the repeal, both measures increase. The coefficients are positive but statistically insignificant in event period 0, increase sharply in event period +1, and remain positive throughout the subsequent post-repeal periods. Thus, the event-time estimates provide support for the parallel-trends assumption and indicate that the increase in retail option trading emerges quickly following the repeal and persists throughout the post-repeal period.

4.3 Heterogeneity by Maturity and Moneyness

We next examine whether the increase in retail option trading varies across contracts with different maturities and moneyness. As discussed in Section 2.3, we expect the response to be stronger for shorter-maturity and out-of-the-money options, which tend to have lower dollar premiums and are particularly associated with speculative retail trading. Table 3 examines this prediction by partitioning option trading activity by maturity and moneyness. Panel A reports results for retail option trades, while Panel B reports results for retail option dollar volume.

Insert Table 3

We first examine differences across option maturities. Retail option trades increase by 31.4% for 0DTE contracts and 22.0% for contracts with one to seven days to expiration, with both estimates statistically significant at the 1% level. In contrast, the increases are economically small and statistically insignificant for contracts with more than one week to expiration. Retail option dollar volume exhibits a similar pattern at short maturities, increasing by 31.4% for 0DTE contracts and 25.4% for contracts with one to seven days to expiration. Thus, the increase in retail option trading following the repeal is concentrated primarily in short-maturity contracts.

We next examine differences across option moneyness. The increase in retail trading is largest for out-of-the-money options. Retail trades increase by 23.6% for OTM options, compared with 23.3% for ATM options and 13.4% for ITM options. Similarly, retail dollar volume increases by 18.7% for OTM options and 20.1% for ATM options, while the increase for ITM options is 11.0% and statistically insignificant. Overall, the moneyness results indicate that the increase in retail trading is concentrated in OTM and ATM options, with little evidence of an increase in ITM options.

Finally, we jointly partition contracts by maturity and moneyness. The largest increase in retail trading occurs among out-of-the-money 0DTE options. Retail trades in these contracts increase by 46.0%, while retail dollar volume increases by 59.5%. Retail trading also increases significantly among out-of-the-money contracts with one to seven days to expiration, with increases of 24.4% in trades and 29.0% in dollar volume. The effects are generally smaller for at-the-money contracts and particularly weak for in-the-money contracts.

Overall, the results indicate that the increase in retail option trading following the PDT repeal is not distributed uniformly across option contracts. The response is strongest among short-maturity and out-of-the-money options and is particularly pronounced for out-of-the-money 0DTE contracts. This pattern is consistent with relaxing the PDT constraint disproportionately increasing the types of short-horizon, speculative option trading favored by retail investors.

5. The Effect of the PDT Repeal on Option Market Quality

5.1 Baseline results

We next examine the effect of the PDT repeal on option market quality. As discussed in Section 2.3, the effect is theoretically ambiguous. Additional relatively uninformed retail order flow may reduce adverse-selection risk and allow liquidity providers to quote tighter spreads. Alternatively, if the additional trading generates correlated order flow or greater inventory and hedging costs, spreads

may widen. We therefore examine whether quoted and effective spreads change following the repeal. Specifically, we re-estimate Equation (1), replacing the retail trading measures with quoted and effective spreads as the dependent variables.

Table 4 presents the results. Using our baseline top-5% definition of HIRT, quoted spreads decline by 0.89% and effective spreads decline by 0.29% for HIRT securities relative to other securities following the repeal. Relative to their unconditional means of 18.0% and 3.6%, respectively, these estimates represent declines of approximately 5% and 8%. The decline in quoted spreads is statistically significant at the 5% level, while the decline in effective spreads is statistically significant at the 1% level.

Insert Table 4

The results are similar using the broader top-20% definition of HIRT. Quoted spreads decline by 1.32% and effective spreads decline by 0.48%, with both estimates statistically significant at the 1% level. Relative to their unconditional means, these estimates correspond to declines of approximately 7% and 13%, respectively. Thus, rather than deteriorating following the repeal, option market liquidity improves among securities with high retail participation.

The narrowing of both quoted and effective spreads is consistent with the additional retail activity following the repeal representing relatively uninformed order flow. Such trading can reduce the adverse-selection risk faced by liquidity providers and allow them to quote tighter spreads. At a minimum, the results provide no evidence that the substantial increase in speculative retail trading documented in Section 4 impaired option market liquidity.

5.2 Event-Time Analysis

We next examine the dynamics of option liquidity around the PDT repeal. We estimate event-time versions of Equation (1) for quoted and effective spreads using our baseline top-5% definition

of HIRT. Specifically, we replace the $Post \times HIRT$ interaction with interactions between HIRT and a series of event-time indicators. Event periods -5 and earlier are combined and serve as the omitted reference period. Figure 2 plots the resulting coefficients for event periods -4 through $+4$, along with 95% confidence intervals. To facilitate comparison between quoted and effective spreads, we scale each coefficient and its confidence interval by the corresponding mean spread reported in Table 1. Thus, the plotted estimates can be interpreted as changes relative to the average level of each spread measure.

Insert Figure 2

Figure 2 provides little evidence of differential trends in option spreads prior to the repeal. The pre-repeal coefficients are statistically insignificant for both quoted and effective spreads and exhibit no systematic trend. Following the repeal, the coefficients for both spread measures generally become negative, indicating improved option liquidity. The declines persist across the post-repeal periods rather than being confined to the immediate aftermath of the repeal. Overall, the event-time estimates support the parallel-trends assumption and indicate that the improvement in option liquidity emerges following the repeal and persists throughout the post-repeal period.

5.3 Heterogeneity by Maturity and Moneyness

We next examine heterogeneity in the spread response across option contracts. One interpretation of the baseline results is that the increase in retail trading induced by the PDT repeal contributes to the decline in option spreads. This interpretation generates a natural cross-sectional prediction: if the increase in retail trading contributes to improved liquidity, spreads should decline more in the types of contracts that experience larger increases in retail trading following the repeal. The results in Section 4.3 show that the increase in retail trading is concentrated in short-maturity options and is particularly pronounced among OTM 0DTE contracts. We therefore examine whether

the decline in spreads exhibits a similar pattern across maturity and moneyness. Panels A and B of Table 5 report the results for quoted spreads and effective spreads, respectively.

Insert Table 5

The quoted-spread results are generally consistent with this prediction. The clearest evidence comes from OTM 0DTE options. Quoted spreads decline by 4.38 percentage points for these contracts, substantially more than for any other maturity-moneyness category. Notably, OTM 0DTE options also experience the largest increase in retail trading following the repeal. More generally, spread declines tend to be larger among contracts experiencing larger increases in retail trading. For example, in Figure 3 we plot the change in volume and the change in spread across the 15 different option groups (5 maturity buckets $\times$ 3 moneyness buckets). The graph reveals a strong positive correlation between the increase in volume and the decline in spread, with a Pearson correlation coefficient of 0.82. The corresponding relation is weaker for effective spreads, which generally decline following the repeal but do not exhibit the same cross-sectional relation with the increase in retail trading⁹. Nevertheless, the strong correspondence between retail trading and quoted spreads, particularly the pronounced increase in retail trading and decline in quoted spreads among OTM 0DTE options, provides suggestive evidence that increased retail trading contributes to improved option liquidity.

6. Robustness

In this section, we examine the robustness of our main findings to alternative measures of retail exposure and sample construction. We first replace our trading-based measure of retail intensity

⁹ In particular, effective spreads do not decline for OTM 0DTE options. One possible explanation is that the rapid price movements and high trading intensity of these contracts make transaction-price-based measures of execution costs particularly noisy. Alternatively, increased retail activity may induce greater competition in displayed quotes without producing a commensurate improvement in execution prices.

with a measure based on investor attention on *Reddit*. We then examine whether our findings are driven by ETFs by excluding them from the sample.

6.1 *Alternative Measure of High Retail Exposure*

Our baseline analysis measures retail exposure using retail option dollar volume during March 2026, prior to the beginning of our estimation period. As an alternative measure, we use investor attention on *Reddit* (Bradley et al., 2024). Specifically, we classify a security as having high *Reddit* attention on a given day if its ticker is mentioned at least 100 times on *Reddit* over the preceding five days. We then re-estimate Equation (1), replacing our baseline HIRT indicator with this time-varying measure of high *Reddit* attention. Because the *Reddit* measure varies over time, its main effect is not absorbed by underlying-security fixed effects. We therefore include both the high-*Reddit*-attention indicator and its interaction with the post-repeal indicator. Unlike our baseline measure, this proxy does not use observed retail option trading to identify securities with high retail participation and therefore provides a useful alternative measure of retail exposure.

Insert Table 6

Panel A of Table 6 reports the results using our *Reddit*-based measure of retail attention. Columns (1)–(4) examine retail option trading. The coefficients on high *Reddit* attention are positive and highly significant across all four specifications, providing validation that the measure identifies securities attracting substantial retail option activity. In the full sample, retail option dollar volume and trades are 46.2% and 35.8% higher, respectively, when a security receives high *Reddit* attention. The associations are particularly pronounced for OTM 0DTE options, where retail dollar volume and trades are 98.8% and 74.4% higher. More importantly, the interaction between high *Reddit* attention and the post-repeal period is also positive. Following the repeal, retail dollar volume and trades increase by an additional 12.1% and 14.0%, respectively, among securities receiving high *Reddit*

attention. The corresponding increases for OTM 0DTE options are substantially larger, at 34.7% and 26.8%. Thus, the *Reddit*-based measure reproduces both the overall increase in retail option trading and the particularly pronounced response among OTM 0DTE options.

Columns (5)–(6) examine quoted spreads. For the full option sample, the post-repeal interaction is negative but statistically insignificant. Among OTM 0DTE options, however, quoted spreads decline by 2.83% for securities receiving high *Reddit* attention, with the estimate statistically significant at the 5% level. This pattern closely parallels our baseline results: the contracts exhibiting the strongest increase in retail trading also exhibit the strongest improvement in quoted liquidity. Thus, using an alternative measure of retail exposure based on *Reddit* attention produces similar conclusions regarding both the increase in speculative retail option trading and the improvement in displayed option liquidity following the PDT repeal.

6.2 *Excluding ETFs and Indexes*

Our baseline sample includes options on both individual stocks, ETFs and indexes. We include ETFs and indexes because they are commonly traded by retail investors and account for substantial activity in short-dated options, including 0DTE options. Thus, excluding ETFs and indexes from the baseline sample would omit an important segment of the retail option market that is particularly relevant to our setting. At the same time, ETF and index options differ from individual-stock options along several dimensions, including their liquidity and the availability and prevalence of short-dated contracts. We therefore examine whether our findings are sensitive to the inclusion of ETFs by excluding them from the sample and reconstructing our high-retail-intensity measure using only individual stocks.

Insert Table 7

Panel A of Table 7 reports the results after excluding ETFs from the sample. The estimates are similar to our baseline findings. For all options, the estimated increase in retail dollar volume declines modestly from 0.194 to 0.152, while the increase in retail trades declines from 0.235 to 0.192. The results for 0DTE OTM options are even more stable: the estimated increase in retail dollar volume changes from 0.595 to 0.600, while the decline in quoted spreads changes from 4.38% to 3.99%. The somewhat greater attenuation in the all-options trading intensity estimates may reflect differences in contract availability, as ETFs are more likely to offer 0DTE options. Overall, the stability of the estimates suggests that our main findings are not driven by retail trading in ETFs.

7. Conclusion

The repeal of the Pattern Day Trader rule provides a unique setting in which to examine how relaxing a longstanding constraint on frequent retail trading affects investor behavior and option market quality. Using the June 2026 repeal of the rule, we find that retail option trading increases substantially in securities with greater retail participation. The response is particularly pronounced in short-maturity options and, most notably, OTM 0DTE options. These findings indicate that relaxing the PDT constraint not only increases retail trading but disproportionately increases activity in contracts commonly associated with short-horizon speculation.

Despite concerns that greater speculative retail activity could impair market quality, we find that option liquidity improves following the repeal. Both quoted and effective spreads decline for securities with high retail participation. The decline in quoted spreads is particularly pronounced for OTM 0DTE options, the same contracts that experience the largest increase in retail trading. More broadly, increases in retail trading across maturity and moneyness categories are strongly associated with declines in quoted spreads. These patterns are consistent with the additional retail activity

representing relatively uninformed order flow that reduces adverse-selection risk for liquidity providers.

Our findings also highlight the potentially ambiguous implications of relaxing trading constraints for retail investor welfare. On the one hand, the repeal shifts retail activity toward more speculative option contracts, which tend to have higher transaction costs and have been associated with lower expected returns for retail investors. On the other hand, option spreads generally narrow following the repeal, reducing transaction costs for market participants. These liquidity benefits may extend beyond the investors directly affected by the PDT rule, including investors who were not previously constrained by the \$25,000 account-equity requirement. Thus, while our evidence identifies important changes in retail trading behavior and option market quality following the repeal, it does not provide a comprehensive assessment of the reform's welfare consequences. Understanding how these competing effects ultimately affect retail investor welfare represents an important avenue for future research.

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Appendix A. Reddit Posts Surrounding PDT Repeal

This appendix presents sample posts from Reddit regarding the repeal of the Pattern Day Trading Rule (PDT).

A.1 Reddit Post Example, About Seven Weeks Before Repeal:

https://www.reddit.com/r/wallstreetbets/comments/1sqw921/pdt_rule_change_goes_live_june_4/

Monday, April 20, 2026, 1:32:54 PM EDT

PDT Rule Change Goes Live June 4

FINRA posted the regulatory notice for the PDT rule elimination!

The effective date is June 4, 2026, but brokers have until Oct. 20, 2027, to implement it: <https://www.finra.org/rules-guidance/notices/26-10>.

Let the countdown begin!

A.2 Reddit Post Example, About Five Weeks Before Repeal:

https://www.reddit.com/r/options/comments/1ta7600/the_pdt_rule_going_away_just_means_mom_dad_your/

Monday, May 11, 2026, 11:45:34 AM EDT

the PDT rule going away just means mom dad your brother can buy more Ode SPX calls this summer.

when millions of traders get the green light to yolo spx calls, the market will be difficult to rugpull. agree or disagree?

A.3 Reddit Post Example, About Four Weeks Before Repeal:

https://www.reddit.com/r/wallstreetbets/comments/1tjrb77/no_more_pdt_restriction/

Thursday, May 21, 2026, 1:19:46 PM EDT

No More PDT Restriction

Boys, the FINRA PDT rule is basically dead.

That's right. The ancient boomer "3 day trades and you're banned unless you have \$25k" garbage under Rule 4210 is getting replaced.

No more:

- "pattern day trader" scarlet letter
- counting trades like your parole officer
- getting locked because you bought NVDA calls 4 times in a week with your \$713 account

The SEC approved changes that replace the old PDT system with real-time margin requirements instead.

Translation for the financially illiterate:

If your broker lets you trade and you have enough margin, you can trade.

The 2001 dot-com era training wheels are finally coming off.

Of course this does NOT mean:

- you suddenly know risk management
- your 0DTE SPY puts are smart
- you won't blow up your account before lunch

It just means the government can no longer stop you from discovering leverage at terminal velocity.

TL;DR:

Soon, you can day trade as much as you want.

Godspeed, regards.

A.4 Reddit Post Example, One Day After Repeal:

https://www.reddit.com/r/wallstreetbets/comments/1ty00hd/i_love_the_new_no_pdt_rule/

Friday, June 5, 2026, 6:47:53 PM EDT

I love the new no PDT rule

Big gain was spy puts after switching back and forth between puts and calls all day not knowing what to do, but luckily I wasn't restricted in # of trades I could do

A.5 Reddit Post Example, Four Days After Repeal:

https://www.reddit.com/r/wallstreetbets/comments/1u0fcmb/pdt_gone_trading_good_qqq_calls/

Monday, June 8, 2026, 1:54:31 PM EDT

PDT Gone, trading good (QQQ calls)

After Friday's put gains, I decided to trade the bounce on QQQ. Might have been a little early on Friday but QQQ came through. Just gonna ride off into the sunset for now, Godspeed regards

A.6 - Reddit Post Example, One Week After Repeal:

https://www.reddit.com/r/wallstreetbets/comments/1u45vgl/pdt_rule_held_me_back/

Friday, June 12, 2026, 3:57:29 PM EDT

PDT rule held me back

Clearly the PDT rule held me back...as the title suggests. Letting my true regarded self trade uncontrolled, I managed to 10x my account in 4 days through mostly 0DTE SPY puts and calls. Is this the way forward?

Appendix B. Variable Definitions

B.1. Option trading activity and market quality variables

Trades — Number of option trades summed across all contracts on the same underlying security each day. Reported in thousands.

Retail Trades — Using the retail trading proxy of Bryzgalova, Pavlova, and Sikorskaya (BPS, 2023), the number of retail-classified trades summed across all contracts on the same underlying security each day. Reported in thousands.

Non-Retail Trades — Trades that are not classified as retail using the proxy of BPS, summed across all contracts on the same underlying security each day. Reported in thousands.

Dollar Volume — The transaction trade price multiplied by the number of contracts $\times 100$, summed across all contracts on the same underlying security each day. Reported in millions.

Retail Dollar Volume — Using the retail trading proxy of BPS, the dollar volume of retail-classified trades summed across all contracts on the same underlying security each day. Reported in millions.

Non-Retail Dollar Volume — Dollar volume of trades that are not classified as retail using the proxy of BPS, summed across all contracts on the same underlying security each day. Reported in millions.

Retail Share of Trades — *Retail Trades* divided by *Trades*, computed for each underlying security each day.

Retail Share of Dollar Volume — *Retail Dollar Volume* divided by *Dollar Volume*, computed for each underlying security each day.

Quoted Spread (%) — The prevailing NBBO ask minus the prevailing NBBO bid at the time of the trade, divided by the quote midpoint. Averaged by dollar-volume across all trades on the same underlying security each day.

Effective Spread (%) — Twice the signed difference between the transaction price and the prevailing NBBO quote midpoint, divided by the quote midpoint, where trades are signed from the customer's perspective following Grauer, Schuster, and Uhrig-Homburg (2026). Averaged by dollar volume across all trades on the same underlying security each day.

B.2. Option contract characteristics

Price — The option transaction price, averaged across all trades on the same underlying security each day.

Moneyness — The percentage distance between the price of the underlying security at the time of the trade and the strike price, signed so that positive values are in the money for both calls and puts. Contracts with absolute moneyness greater than 10% are excluded from the sample.

OTM — Option contracts with moneyness less than -1% .

ATM — Option contracts with moneyness between -1% and 1% , inclusive.

ITM — Option contracts with moneyness greater than 1%.

Days to Expiration (DTE) — Calendar days remaining until the option expires, measured at the time of the trade. Used to sort contracts into five maturity buckets: 0DTE, 1–7 days, 8–14 days, 15–30 days, and 31+ days. Contracts with more than 365 days to expiration (LEAPS) are excluded.

Trade Direction — Trades are signed from the customer's perspective following Grauer et al. (2026). If the quoted sizes at the bid and ask are equal, a trade is classified as a buy if the price is above the quote midpoint and a sell if below. Otherwise, a trade is classified as buyer-initiated (seller-initiated) if the price is closer to the ask (bid).

B.3. Aggregating Within Option Buckets

Trades are first grouped into bins defined by date, underlying security, moneyness class (OTM, ATM, ITM), and expiration bucket. Bins can then be collapsed along any dimension to form broader aggregates, such as within security-date-moneyness (all expirations), within security-date-expiration (all moneyness classes), or across both to the security-date level.

Within a bin and at every level of aggregation, count and dollar volume variables are summed, while quoted and effective spreads are dollar-volume-weighted averages.

B.4. Underlying security characteristics

Underlying Price — The price of the underlying security at the time of the trade.

Reddit Count — The number of times the underlying security's ticker is mentioned on Reddit's investment and day-trading forums each day.

High-Retail — An indicator equal to one for underlying securities in the top 5% of retail option dollar volume during March 2026. An alternative classification uses the top 20% as the threshold.

High Reddit Attention — An indicator equal to one if the underlying security's ticker is mentioned at least 100 times on Reddit over the preceding five days.

B.5. Regression variables

Post — An indicator equal to one if the date is on or after June 5, 2026, zero otherwise.

Post $\times$ High-Retail — The interaction of Post with a high retail exposure indicator.

Table 1: Descriptive Statistics

This table reports descriptive statistics for the options market sample. Observations are at the security-day level. Underlying securities in the sample include common stock, exchange-traded funds (ETFs), and indexes. Sample eligibility is determined over March 2026, the period preceding the estimation window, which begins in April 2026. The sample period is from April 2026 to August 2026. This options sample (OPRA) excludes trades classified as cancellations, prices that aren't at or within the National Best Bid and Offer (NBBO), quotes classified as crossed or locked, quotes with a null bid or null ask, contracts with time to expiration of greater than 365 days, contracts with absolute moneyness greater than 10%. Trade price is restricted to be no less than intrinsic value minus \$0.01, a screen against arbitrage which would indicate data errors. A firm enters the sample with at least 500 trades on at least 75% of trading days in March 2026. The sample includes 387 firms.

	Count	Mean	25%	Median	75%
Dollar Volume (\$millions)	34,639	53.86	1.14	3.29	11.71
Non-Retail Dollar Volume (\$millions)	34,639	38.23	0.80	2.36	8.61
Retail Dollar Volume (\$millions)	34,639	15.63	0.27	0.80	3.01
Trades (1000s)	34,639	19.00	1.11	2.29	5.81
Non-Retail Trades (1000s)	34,639	6.27	0.47	1.03	2.53
Retail Trades (1000s)	34,639	12.72	0.59	1.21	3.27
Retail Share of Dollar Volume (%)	34,639	0.28	0.20	0.28	0.36
Retail Share of Trades (%)	34,639	0.57	0.50	0.59	0.66
Quoted Spread (%)	34,639	0.18	0.11	0.17	0.24
Effective Spread (%)	34,639	0.04	0.02	0.03	0.05
Price	34,639	5.51	1.17	2.69	6.00
Underlying Price	34,639	179.73	27.01	80.45	182.11
Reddit Count	34,639	12.07	0.00	0.00	6.00

Table 2: Retail Option Trading Following the PDT Repeal

This table reports estimates from difference-in-differences regressions examining retail option trading following the repeal of the Pattern Day Trader (PDT) rule. High-retail-intensity (HIRT) securities are identified using total retail option dollar volume during March 2026, prior to the beginning of the estimation period. Panel A classifies securities in the top 5% of retail option dollar volume as HIRT, while Panel B uses a top-20% threshold. The dependent variables are retail option trades, retail option dollar volume, retail trades as a share of total option trades, and retail dollar volume as a share of total option dollar volume. All regressions include underlying-security and date fixed effects; consequently, the main effects of HIRT and the post-repeal indicator are absorbed by the fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

High-Retail %:	Top 5%				Top 20%			
	Retail Trades	Retail \$ Volume	Retail Share (Tr)	Retail Share (\$)	Retail Trades	Retail \$ Volume	Retail Share (Tr)	Retail Share (\$)
Post × High-Retail	0.2354*** (3.92)	0.1941** (2.50)	0.0240*** (3.12)	0.0199* (1.75)	0.1382*** (3.45)	0.1699*** (3.29)	0.0064 (0.94)	0.0019 (0.37)
# Obs.	34,639	34,639	34,639	34,639	34,639	34,639	34,639	34,639
# Securities	387	387	387	387	387	387	387	387
# Dates	90	90	90	90	90	90	90	90
Security FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3: Retail Option Trading Following the PDT Repeal by Contract Maturity and Moneyness

This table reports estimates of retail option trading following the repeal of the Pattern Day Trader (PDT) rule across contracts with different maturities and moneyness. Panel A uses the log of retail option dollar volume as the dependent variable, while Panel B uses the log of retail option trades. Rows partition contracts by moneyness, and columns partition contracts by days to expiration. The column labeled “All” includes contracts of all maturities, while the row labeled “All” includes contracts of all moneyness levels. High-retail-intensity (HIRT) securities are defined as securities in the top 5% of retail option dollar volume during March 2026, prior to the beginning of the estimation period. All regressions include underlying-security and date fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Retail Dollar Volume							
		Maturity					
Moneyness		All	0	1-7	8-14	15-30	31+
All	Post × High-Retail	0.1941**	0.3136***	0.2544**	0.0569	0.1178	0.083
		(2.50)	(2.58)	(2.11)	(0.67)	(1.61)	(1.59)
	# Obs.	34,639	8,252	33,515	33,882	34,616	34,639
OTM	Post × High-Retail	0.1868***	0.5949***	0.2897**	0.1509**	0.1789**	0.1189**
		(2.81)	(3.50)	(2.38)	(2.02)	(2.49)	(2.18)
	# Obs.	34,639	7,410	33,235	33,810	34,594	34,637
ATM	Post × High-Retail	0.2010**	0.3338***	0.1798*	0.063	0.1492*	0.0902
		(2.36)	(3.15)	(1.66)	(0.63)	(1.65)	(1.15)
	# Obs.	34,306	8,156	33,156	33,359	33,947	33,526
ITM	Post × High-Retail	0.1099	-0.0484	0.3007	-0.0110	0.1027	0.0451
		(0.92)	(-0.26)	(1.51)	(-0.10)	(1.02)	(0.86)
	# Obs.	34,634	8,246	33,459	33,683	34,415	34,619
Panel B: Retail Trade Count							
		Maturity					
Moneyness		All	0	1-7	8-14	15-30	31+
All	Post × High-Retail	0.2354***	0.3139***	0.2202***	0.0423	0.0469	-0.0032
		(3.92)	(3.50)	(2.61)	(0.72)	(0.82)	(-0.07)
	# Obs.	34,639	8,252	33,515	33,882	34,616	34,639
OTM	Post × High-Retail	0.2360***	0.4602***	0.2436***	0.0727	0.0557	0.0025
		(3.83)	(3.51)	(2.59)	(1.30)	(0.95)	(0.05)
	# Obs.	34,639	7,410	33,235	33,810	34,594	34,637
ATM	Post × High-Retail	0.2325***	0.2684***	0.1616*	0.0056	0.0325	-0.0082
		(3.39)	(3.20)	(1.94)	(0.08)	(0.55)	(-0.18)
	# Obs.	34,306	8,156	33,156	33,359	33,947	33,526
ITM	Post × High-Retail	0.1339	0.1226	0.2502*	-0.0569	0.0294	-0.0108
		(1.42)	(0.94)	(1.70)	(-0.73)	(0.49)	(-0.23)
	# Obs.	34,634	8,246	33,459	33,683	34,415	34,619

Table 4: Quoted and Effective Spreads Following the PDT Repeal

This table reports estimates from difference-in-differences regressions of quoted and effective percentage spreads following the repeal of the Pattern Day Trader (PDT) rule. High-retail-intensity (HIRT) securities are identified using retail option dollar volume during March 2026, prior to the beginning of the estimation period. Panel A classifies securities in the top 5% of retail option dollar volume as HIRT, while Panel B uses a top-20% threshold. All regressions include underlying-security and date fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

High-Retail %:	Top 5%		Top 20%	
	Quoted Spread (%)	Effective Spread (%)	Quoted Spread (%)	Effective Spread (%)
Post $\times$ High-Retail	-0.0089** (-1.98)	-0.0029*** (-3.32)	-0.0132*** (-4.29)	-0.0048*** (-6.31)
# Obs.	34,639	34,639	34,639	34,639
# Securities	387	387	387	387
# Dates	90	90	90	90
Security FE	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes

Table 5: Quoted and Effective Spreads Following the PDT Repeal by Contract Maturity and Moneyness

This table reports estimates of quoted and effective percentage spreads following the repeal of the Pattern Day Trader (PDT) rule across contracts with different maturities and moneyness. Panel A uses the quoted percentage spread as the dependent variable, while Panel B uses the effective percentage spread. Rows partition contracts by moneyness, and columns partition contracts by days to expiration. The column labeled “All” includes contracts of all maturities, while the row labeled “All” includes contracts of all moneyness levels. High-retail-intensity (HIRT) securities are defined as securities in the top 5% of retail option dollar volume during March 2026, prior to the beginning of the estimation period. All regressions include underlying-security and date fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Quoted Spreads							
		Maturity					
Moneyness		All	0	1-7	8-14	15-30	31+
All	Post × High-Retail	-0.0093**	-0.0208**	-0.0104	-0.0087	-0.0170**	-0.0060***
		(-2.03)	(-2.18)	(-0.99)	(-1.62)	(-2.51)	(-3.01)
	# Obs.	34,639	8,252	33,515	33,882	34,616	34,639
OTM	Post × High-Retail	-0.0100**	-0.0438***	-0.0111	-0.0124*	-0.0203**	-0.0076***
		(-1.98)	(-3.61)	(-0.74)	(-1.91)	(-2.45)	(-3.33)
	# Obs.	34,639	7,410	33,235	33,810	34,594	34,637
ATM	Post × High-Retail	-0.0117	-0.0229***	-0.0099	-0.0080*	-0.0137***	-0.0048*
		(-1.29)	(-2.99)	(-0.88)	(-1.86)	(-2.74)	(-1.94)
	# Obs.	34,306	8,156	33,156	33,359	33,947	33,526
ITM	Post × High-Retail	-0.0040	-0.0118	-0.0079	-0.0020	-0.0109**	-0.0046***
		(-1.11)	(-1.59)	(-1.40)	(-0.54)	(-2.37)	(-2.78)
	# Obs.	34,634	8,246	33,459	33,683	34,415	34,619
Panel B: Effective Spreads							
		Maturity					
Moneyness		All	0	1-7	8-14	15-30	31+
All	Post × High-Retail	-0.0028***	-0.0039*	-0.0032	-0.0048***	-0.0040***	-0.0021***
		(-3.08)	(-1.94)	(-1.52)	(-4.11)	(-4.24)	(-5.93)
	# Obs.	34,639	8,252	33,515	33,882	34,616	34,639
OTM	Post × High-Retail	-0.0030**	0.0019	-0.0040	-0.0064***	-0.0046***	-0.0022***
		(-2.45)	(0.26)	(-1.30)	(-4.42)	(-3.94)	(-5.66)
	# Obs.	34,639	7,409	33,234	33,810	34,594	34,637
ATM	Post × High-Retail	-0.0032	-0.0040	-0.0036*	-0.0024***	-0.0012	-0.0012**
		(-1.57)	(-1.07)	(-1.76)	(-2.68)	(-1.57)	(-2.19)
	# Obs.	34,306	8,155	33,155	33,345	33,928	33,499
ITM	Post × High-Retail	-0.0008	-0.0038***	0.0001	-0.0008	-0.0007	-0.0013***
		(-1.27)	(-2.89)	(0.13)	(-1.25)	(-1.07)	(-3.30)
	# Obs.	34,634	8,246	33,456	33,669	34,407	34,615

Table 6: Retail Option Trading and Quoted Spreads Following the PDT Repeal: Reddit Attention

This table reports estimates of retail option trading and quoted percentage spreads following the repeal of the Pattern Day Trader (PDT) rule using Reddit attention as an alternative, time-varying measure of retail exposure. The dependent variables are retail option dollar volume, retail option trades, and quoted percentage spreads, each estimated for all option contracts and for out-of-the-money zero-days-to-expiration (OTM 0DTE) contracts. A security is classified as having high Reddit attention on a given day if its ticker is mentioned at least 100 times on Reddit over the preceding five days. All regressions include underlying-security and date fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable:	Retail Trades (All)	Retail Trades (0DTE OTM)	Retail \$ Volume (All)	Retail \$ Volume (0DTE OTM)	Quoted Spreads (All)	Quoted Spreads (0DTE OTM)
Post $\times$ High-Retail	0.1395*** (3.03)	0.2679** (2.38)	0.1214* (1.90)	0.3467** (2.23)	-0.0048 (-1.40)	-0.0283** (-2.46)
High-Retail	0.3581*** (7.02)	0.7441*** (4.75)	0.4616*** (6.44)	0.9879*** (4.70)	-0.0063** (-2.45)	-0.0340** (-2.54)
# Obs.	34,639	7,410	34,639	7,410	34,639	7,410
# Securities	387	381	387	381	387	381
# Dates	90	90	90	90	90	90
Security FE	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: Retail Option Trading and Quoted Spreads Following the PDT Repeal: Excluding ETFs & Indexes

This table reports estimates of retail option trading and quoted percentage spreads following the repeal of the Pattern Day Trader (PDT) rule after excluding exchange-traded funds (ETFs) and indexes from the sample. The dependent variables are retail option dollar volume, retail option trades, and quoted percentage spreads, each estimated for all option contracts and for out-of-the-money zero-days-to-expiration (OTM 0DTE) contracts. High-retail-intensity (HIRT) securities are defined as securities in the top 5% of retail option dollar volume during March 2026, prior to the beginning of the estimation period. All regressions include underlying-security and date fixed effects. Standard errors are clustered by ticker symbol and date, and t-statistics are reported in parentheses below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable:	Retail Trades (All)	Retail Trades (0DTE OTM)	Retail \$ Volume (All)	Retail \$ Volume (0DTE OTM)	Quoted Spreads (All)	Quoted Spreads (0DTE OTM)
Post $\times$ High-Retail	0.1924*** (2.96)	0.4110*** (3.43)	0.1516* (1.69)	0.5998*** (3.92)	-0.0076 (-1.57)	-0.0399*** (-3.05)
# Obs.	28,034	5,770	28,034	5,770	28,034	5,770
# Securities	313	311	313	311	313	311
# Dates	90	90	90	90	90	90
Security FE	Yes	Yes	Yes	Yes	Yes	Yes
Date FE	Yes	Yes	Yes	Yes	Yes	Yes

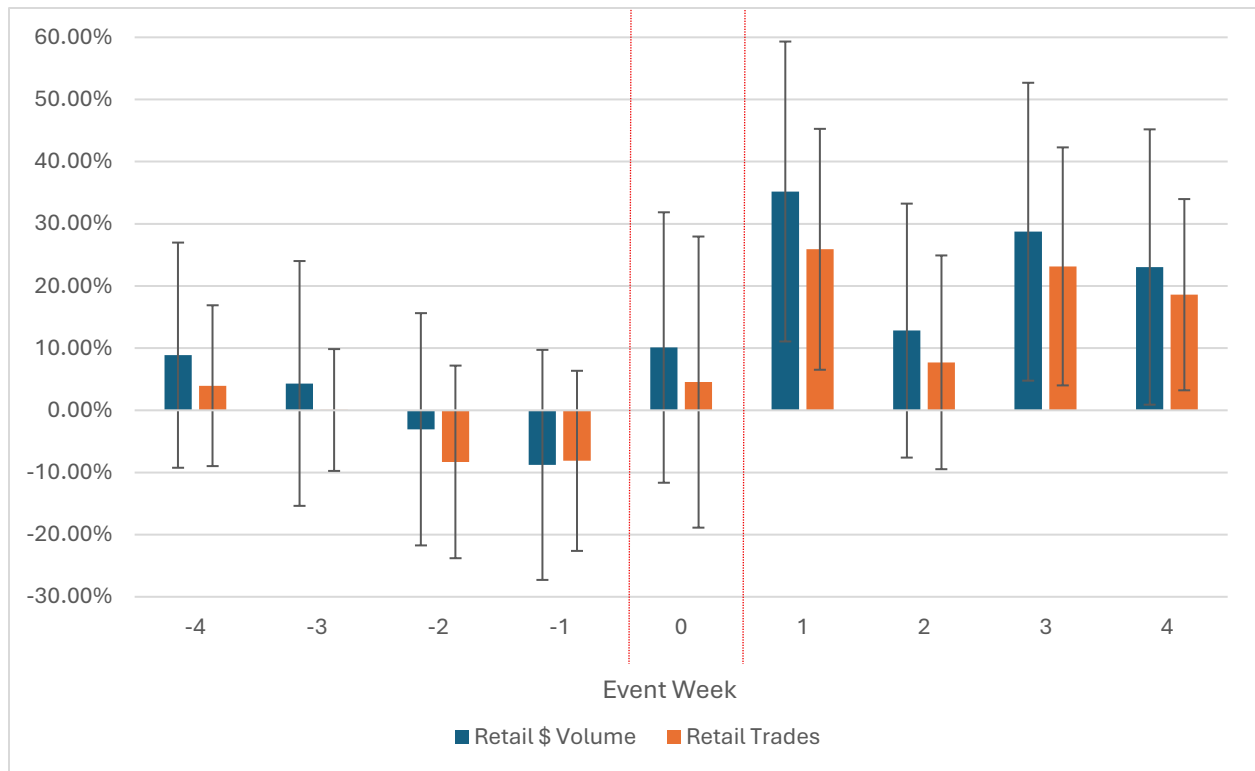


Figure 1: Retail Option Trading Around the PDT Repeal

Figure 1 plots event-time coefficients from difference-in-differences regressions of retail option trading around the repeal of the Pattern Day Trader (PDT) rule. The figure reports coefficient estimates for the log of retail option dollar volume and the log of retail option trades. High-retail-intensity (HIRT) securities are defined as securities in the top 5% of retail option dollar volume during March 2026, prior to the beginning of the estimation period. All regressions include underlying-security and date fixed effects. Vertical bars denote 95% confidence intervals. The vertical dashed line denotes the repeal of the PDT rule.

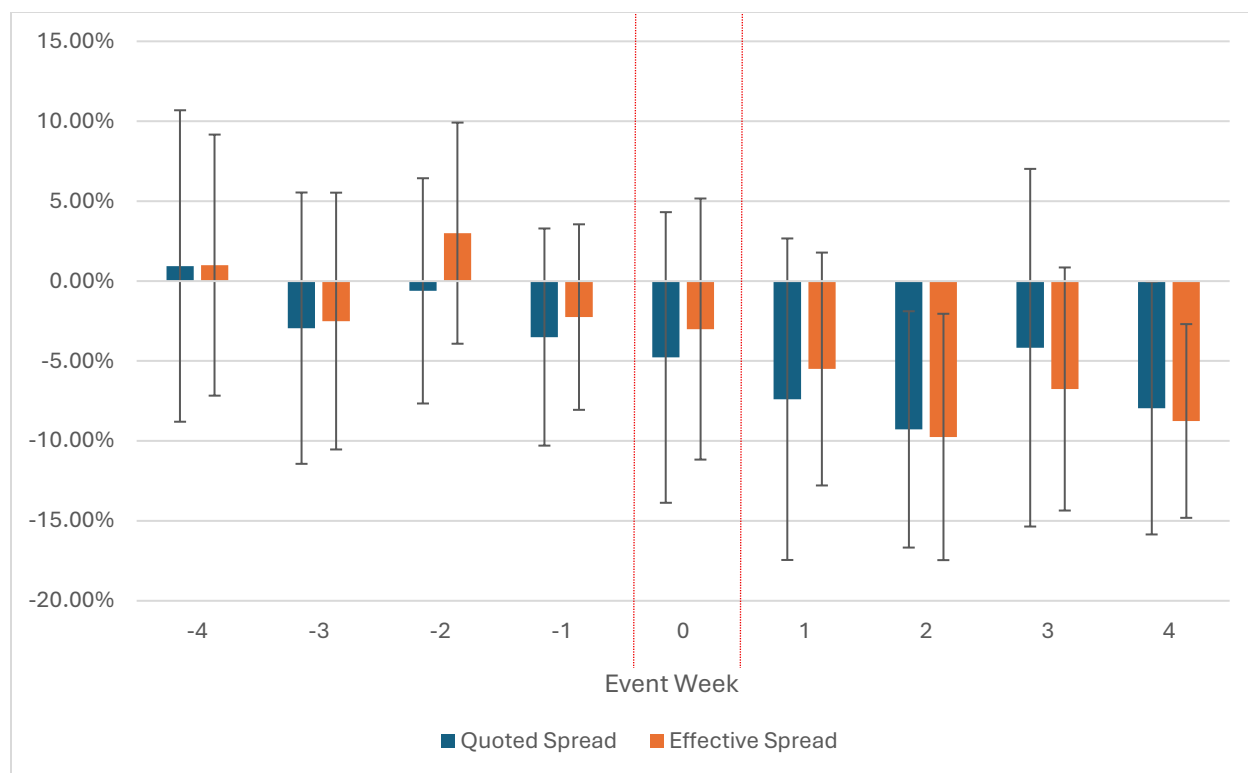


Figure 2: Quoted and Effective Spreads Around the PDT Repeal

Figure 2 plots event-time coefficients from difference-in-differences regressions of option spreads around the repeal of the Pattern Day Trader (PDT) rule. The figure reports estimates for quoted and effective percentage spreads. To facilitate comparison across the two spread measures, each coefficient and its confidence interval are scaled by the corresponding mean spread reported in Table 1. Thus, the plotted estimates represent changes relative to the average of each spread measure. High-retail-intensity (HIRT) securities are defined as securities in the top 5% of retail option dollar volume during March 2026, prior to the beginning of the estimation period. All regressions include underlying-security and date fixed effects. Vertical bars denote 95% confidence intervals. The vertical dashed line denotes the repeal of the PDT rule.

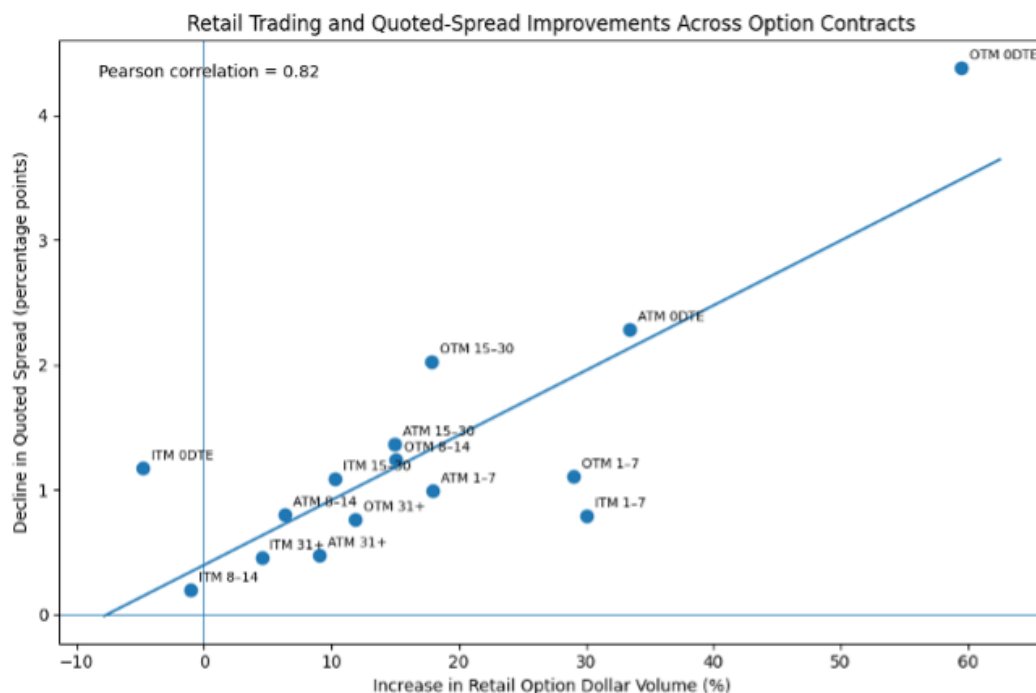


Figure 3: Retail Option Trading and Quoted-Spread Improvements Across Maturity and Moneyness Buckets

Figure 3 plots the change in retail option dollar volume against the decline in quoted spreads across fifteen option groups, defined by the intersection of five maturity buckets (0DTE, 1-7 days-to-maturity, 8-14 days-to-maturity, 15-30 days-to-maturity, and 31 and over days-to-maturity) and three moneyness buckets (out-of-the-money, at-the-money, and inside-the-money). The fitted line denotes the linear relationship between the two series. The Pearson correlation coefficient between the increase in volume and the decline in spread is 0.82.