Brokerage Commissions and Trading Volume: Lessons from the 20th Century*

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Abstract

We ask how brokerage commissions affect trading activity. Estimating this causal effect is difficult because commissions are typically endogenous to the market. We turn to the pre-1976 era, when the New York Stock Exchange set and repeatedly revised minimum commission schedules, with commission rates a deterministic function of a stock's price. This institutional feature delivers two complementary identification strategies. First, we exploit discontinuities in the price-based commission schedule in a regression kink design: higher commission rates raise trading volume, with a 1% increase in commissions *increasing* volume by approximately between 0.15% and 0.40%. Second, we exploit discrete changes in the schedule in a difference-in-differences design around rule revisions: trading volume declines in advance of new commission rules and then increases by 0.11-0.14% upon implementation. Both designs point to economically meaningful increases in trading activity, concentrated in more volatile stocks. We rationalize these findings with a mechanism in which fixed minimum commission schedules facilitate anti-competitive brokerage behavior: by limiting price competition, they increase the incentives and scope for brokers to steer naïve investors toward high-commission stocks, amplifying speculative trading precisely where volatility is highest.

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1 Introduction

Modern reductions in brokerage commissions—culminating in the widespread availability of zero-commission equity trading—have renewed interest in how trading costs shape asset markets. Lower explicit fees plausibly broaden retail participation, alter investors' trading intensity, and change the composition of order flow, with downstream effects on volume, volatility, and price discovery.[1] At the same time, the fee schedule is only one component of the effective cost of trading, and the modern era features simultaneous changes in market structure, information technology, and brokerage business models. These concurrent shifts make it hard to cleanly attribute observed changes in trading and prices to commissions alone.

That identification challenge motivates our turn to a historical setting in which commissions vary for reasons orthogonal to contemporaneous shocks in investor demand or firm fundamentals. Prior to the deregulation of fixed brokerage commissions on May 1, 1975 (commonly known as "May Day"), the New York Stock Exchange maintained detailed minimum commission schedules that applied broadly and changed through discrete, exchange-wide revisions. This environment delivers plausibly exogenous variation in trading costs while also providing an unusually long time series—spanning many years and multiple rule changes—relative to the short window available in modern data. The historical lens therefore lets us study the effects of commissions on trading activity in a setting where the policy variation is explicit and repeated.

Our key source of institutional variation is the NYSE minimum commission schedule described and compiled by Jones (2001). In this regime, commissions were a deterministic function of observable trade characteristics—most prominently the stock's price—implying piecewise-linear schedules with kinks and occasional discrete revisions. For example, a typical schedule would imply that the minimum commission for a "round lot" trade increases with dollar trade size but at different marginal rates across price bins (e.g., a different slope for trades in stocks priced below a threshold than for trades in higher-priced stocks). To illustrate, Figure 1 presents the commission schedule used by the NYSE between November 10, 1953 and May 1, 1958. There are kink points at both the stock price of \$20 and at \$50. The slope on commission rates is steepest for prices below \$20 and is flattest for prices above \$50.

Furthermore, when the NYSE revised the schedule, it would mechanically change the

[1]For recent studies on effects of the low-commission environment, see e.g., Fedyk, 2021; Welch, 2022; Barber et al., 2022; Farrell et al., 2022.

implied commission for a given stock at a given price. It would sometimes steepen or flatten the slope within a price region, and sometimes by moving the location of a threshold. Therefore, the NYSE revisions would alter commissions for some stocks more than others even absent any change in underlying fundamentals.

We exploit this structure with two complementary research designs. First, we use a regression kink design (RKD) that leverages the slope changes embedded in the schedule: when the commission rule implies a kink at a particular stock-price threshold, the mapping from price to minimum commission changes marginally at that point, allowing us to identify the local causal effect of commissions on trading volume from the induced change in the commission "slope."

Second, we implement a difference-in-differences (DiD) strategy around discrete rule revisions. Because each revision changes the commission schedule in predictable ways across price regions, we can compare changes in trading activity for stocks differentially exposed to the revision (e.g., those whose implied commissions rise or fall more) relative to stocks that are less affected, before and after implementation. Together, the RKD and DiD approaches let us estimate the effect of brokerage commissions on trading volume using several dozen instances of exogenous variation over a very long time frame.

Our RKD estimates imply a positive and economically meaningful causal effect of commissions on trading activity. Pooling information across 18 independent kink points in the NYSE minimum-commission schedule set between 1938 and 1972, we estimate that a 1% increase in the commission rate increases trading volume by roughly 0.15% to 0.40% in the neighborhood of the kinks. This range is robust to a battery of standard RKD implementations (see Card et al., 2015): we vary the local polynomial order (linear versus quadratic), allow for specifications with and without regularization of curvature around the kink, and report conventional as well as bias-corrected (robust) inference under mean-squared-error–optimal bandwidth selection (with a triangular kernel). Across these alternatives, the resulting elasticity estimates remain consistently positive, with the variation in point estimates primarily reflecting the usual bias–variance tradeoffs embedded in different bandwidth, polynomial, and bias-correction choices rather than sensitivity to any single kink episode.

We complement the RKD evidence with a difference-in-differences design that exploits discrete revisions to the NYSE commission schedule. We study nine independent regime changes and implement event-study DiD estimates in stacked form, treating each revision as a separate "event" and then aggregating across events. Identification comes from the fact that each revision changes minimum commissions differentially across stock-price regions, generating cross-sectional variation in treatment intensity: for a given regime change, stocks whose prevailing prices fall in regions with larger mechanical commission increases experience a larger treatment effect than otherwise similar stocks in regions with smaller changes. This structure maps the announced rule revision to predicted commission changes, which we use to form the treatment variable in the stacked DiD.

The main DiD estimates likewise imply a positive elasticity of trading volume with respect to commissions. Across specifications that stack the nine regime changes and weight observations by the magnitude of the mechanically implied commission change within each price region, the baseline estimates indicate that a 1% increase in commissions raises trading volume by approximately 0.11–0.14%. These magnitudes are stable across common DiD implementations: we report specifications with increasingly rich fixed effects (including event-by-calendar-time effects and stock fixed effects), alternative windows around implementation, and versions that flexibly absorb differential trends by price region. Taken together, the DiD results corroborate the RKD evidence that higher minimum commissions are associated with higher trading activity.

Using dynamic DiD estimates, we find that trading volume rises gradually following implementation of a new regime, with the effect building over subsequent months rather than jumping immediately on the effective date. In the event-time profiles, the three-month pre-period is on average flat, supportive of parallel trends locally around implementation. At the same time, trading volume tends to be elevated further back in the pre-period (i.e., in the months prior to three months before the regime change). Because the NYSE typically announced forthcoming revisions several months before they took effect, we interpret these patterns as evidence of anticipation and subsequent resolution: trading activity responds in advance as market participants adjust to the coming change, and then continues to evolve after implementation as the new commission regime becomes the operating environment.

These results are puzzling through the lens of standard demand intuition: holding fundamentals fixed, higher trading costs should depress trading by lowering the net expected return to transacting. In the same way that a stock priced above its fundamental value must be paired with sufficiently optimistic beliefs about future payoffs to justify purchase, a higher commission wedge should require sufficiently stronger expected gains from trade to offset the larger round-trip cost. Reconciling a positive commission–volume elasticity therefore requires a mechanism in which the commission floor changes the composition of trading rather than simply scaling down a representative investor's demand for transactions.

We develop such a mechanism by taking seriously the view prominent in policy debates leading up to "May Day" that fixed NYSE commission schedules were anti-competitive and designed to protect brokerage rents (see e.g., Friend and Blume (1973)). In our framework, a binding commission floor raises broker profitability on trades that generate higher minimum fees, and these rents create incentives for brokers to steer customers toward "high-commission" stocks. When some investors are partially naive about trading costs—or, more broadly, when they underweight commissions relative to expected returns—broker persuasion and advertising can expand trading in precisely those securities that are most profitable to intermediate. This channel is especially potent when stocks are more volatile: higher volatility increases the frequency with which return realizations generate perceived trading opportunities, making it easier for brokers to stimulate speculative turnover despite relatively higher fees. Consistent with this implication, the commission effects are strongest among more volatile stocks.

We further provide suggestive evidence from the brokerage sector by constructing novel historical measures of brokerage revenues, using historical SEC reports on brokerage registrations and the commissions schedules in Jones (2001). Brokerage revenues rise sharply when market trading volume increases. However, we find little corresponding entry of brokerage firms when profitability expands, a pattern consistent with sustained rents in an environment with limited competitive pressure.

The implications are twofold. First, our findings caution against interpreting commission levels as a simple "tax on trading" whose primary effect is to ration demand: when intermediation is shaped by product steering and heterogeneous sophistication, raising posted trading costs can reallocate attention toward high-rent trades and thereby increase turnover.[2] Second, the results speak directly to contemporary policy debates in which commissions have been replaced by less salient forms of compensation (e.g., payment for order flow): lowering explicit commissions need not reduce the incentives for brokers to promote high-rent activity if rents are simply shifted to alternative margins. More broadly, our evidence highlights that the market impact of trading costs depends on the industrial organization of intermediation and on how investors perceive and internalize those costs—a lesson that is as relevant for today's retail-facing platforms as it was for the fixed-commission era.

Related Literature

A central development in modern retail brokerage is the widespread adoption of zero-

[2] Some modern-day papers study how financial intermediaries steer customers to inferior products either through advertising or salient features (e.g., Célérier and Vallée, 2017; Egan, 2019; Vokatá, 2021; Gao et al., 2024).

commission trading and the accompanying shift toward broker monetization through order routing and wholesaler internalization. This institutional change altered both the salience and the incidence of trading costs: rather than paying an explicit per-trade commission, retail investors may bear costs through execution quality, while brokers face incentives shaped by routing arrangements and competition among wholesalers. Recent empirical work links reductions in salient trading costs to changes in retail trading behavior and market outcomes, including increased speculative activity and potential welfare losses when lower costs induce excessive trading (Even-Tov et al., 2026; Chen and Lin, 2026).

A growing microstructure literature evaluates whether the retail execution regime delivers cost savings and how those savings vary across brokers and wholesalers. Using comprehensive execution-quality data, Dyhrberg et al. (2025) documents substantial heterogeneity in retail execution costs and emphasizes the role of wholesaler scale economies and competitive entry in shaping outcomes. Related evidence from wholesaler data finds that execution quality can be better than what is inferred from standard public benchmarks once one accounts for the composition of orders and additional dimensions of price/size improvement (Battalio and Jennings, 2023). At the same time, order-routing choices need not fully reflect execution-quality differences, consistent with frictions in broker monitoring and imperfect competition in the broker–wholesaler relationship (Huang et al., 2024). Complementing this focus on marketable orders, Anand et al. (2025) shows that retail limit orders are economically important and can deliver favorable implementation shortfall once non-execution costs are incorporated, underscoring that "free trading" cannot be evaluated solely through headline commissions.

Finally, evidence on the retail investor side highlights that household constraints and inattention can weaken the disciplining force of competition on non-salient fee dimensions. Eaton et al. (2025) shows that many investors are not aware of fee differentials and that making fees salient shifts stated brokerage preferences, consistent with limited attention to pricing. More broadly, the quality of retail trading and the sensitivity of market quality to retail participation depend on the sophistication of retail traders and the robustness of trading infrastructure (Eaton et al., 2022). Together, these studies motivate empirical designs—including historical quasi-experiments—that isolate how changes in explicit trading fees affect retail trading through intermediary incentives, steering, and the allocation of attention across securities.

A large pre–zero-commission literature studies how retail participation shapes prices and market quality. A first strand emphasizes attention and salience as drivers of retail demand (see e.g., Da et al., 2011; Frydman and Wang, 2020). In this view, retail investors face a search problem on the buy side and therefore disproportionately purchase stocks that are "attention grabbing" (e.g., in the news, with unusual volume, or extreme recent returns), with implications for short-run demand pressure and predictability (Barber and Odean, 2008). Relatedly, firms can influence investor attention through product-market advertising: higher advertising is associated with contemporaneous retail buying and abnormal returns, followed by lower future returns, consistent with temporary price pressure tied to attention (Lou, 2014).

A second strand focuses on sentiment and correlated retail trading as an equilibrium force in return comovement and cross-sectional patterns. Using detailed brokerage data, Kumar and Lee (2006) show that retail trades are systematically correlated across stocks, and that this common component helps explain return comovements in stocks with high retail concentration and limits to arbitrage. Complementary evidence using small-trade volume as a proxy for retail activity links retail demand to medium-run return patterns: stocks with strong buy-initiated small-trade volume subsequently underperform those with strong sell-initiated small-trade volume (Hvidkjaer, 2008). Together, these papers support a view in which retail flows can be systematic and price-relevant, especially in segments where arbitrage is difficult.

A third strand asks whether retail trades are primarily informed, liquidity-providing, or noise-driven.[3] Using NYSE audit-trail style measures of net individual trading, Kaniel et al. (2008) document that individuals tend to buy after declines and sell after increases, and that intense net buying predicts short-horizon positive excess returns, consistent with a liquidity provision channel. More recent measurement advances show how to identify marketable retail order imbalances in U.S. transactions data and find modest short-horizon predictability, with evidence that cannot be fully explained by persistence or simple contrarian liquidity provision (Boehmer et al., 2021). At the same time, other evidence points to destabilizing or noise-trader effects: exploiting a French market reform that raises the relative cost of speculative retail trading, Foucault et al. (2011) show that reducing retail speculative activity lowers volatility and return reversals, consistent with retail trading contributing to transitory price movements.

A closely related literature studies speculative retail trading and welfare. Han and Kumar (2013) link speculative retail activity to asset prices in ways consistent with sentiment-driven demand shocks. In a policy-relevant setting outside equities, Heimer and Simsek (2019) evaluate leverage caps in retail FX and show that limiting leverage reduces trading volume and retail losses while shrinking intermediary capital, highlighting how institutional design can

[3] See e.g., Kelley and Tetlock, 2013; Barrot et al., 2016.

shape retail participation and outcomes. In sum, this body of work provides mechanisms—attention, sentiment/correlated demand, liquidity provision versus noise/speculation—that discipline interpretations of quantity responses to trading costs in modern and historical settings.

Finally, our paper builds on an early literature that analyzes the NYSE system of fixed minimum commissions and its dismantling on "May Day" (May 1, 1975). Early studies argue that minimum commission schedules sustained supracompetitive brokerage rents and cross-subsidization, limiting price competition in brokerage services (Tinic and West, 1971; Friend and Blume, 1973). Historical accounts link deregulation to competitive pressures and regulatory constraints, emphasizing entry and expansion by discount brokers once commissions became negotiable (Jarrell, 1984). Empirically, May Day is associated with a large decline in execution costs and no deterioration in market quality: Jones and Seguin (1997) find that volatility does not rise and if anything falls around commission deregulation, including in difference-in-differences comparisons using Nasdaq as a control. Turley (2012) develops a mechanism in which lower transaction costs can increase (not decrease) resources devoted to trading and information acquisition, with especially strong effects at short horizons; using May Day as a natural experiment, he presents evidence linking the post-1975 drop in costs to increased market activity and price informativeness. Related microstructure decompositions emphasize that commissions are a first-order component of total trading costs (alongside spreads and price impact), so commission reforms can materially move all-in trading costs even absent large changes in quoted spreads (Berkowitz et al., 1988). Longer-run evidence likewise documents large secular declines in trading costs and rising liquidity over the twentieth century, placing May Day within broader changes in market structure and technology (Jones, 2001).[4]

2 Data and Institutional Background

2.1 Institutional background: NYSE minimum commissions and May Day

For much of the twentieth century, the New York Stock Exchange (NYSE) operated a system of fixed minimum commissions for member firms. Under this regime, brokers were required to

[4]Our setting and analysis is complementary to older literature studying the effects of margin requirements on stock market activity, such as Moore, 1966; Officer, 1973; Luckett, 1982; Schwert, 1989; Hardouvelis, 1990; Hsieh and Miller, 1990; Kupiec and Sharpe, 1991; Seguin and Jarrell, 1993; Akbas et al., 2024.

charge at least the Exchange-prescribed minimum commission for executing customer trades in NYSE-listed stocks. Contemporary analyses emphasize that these minimums functioned as a restriction on price competition in brokerage services, sustained brokerage rents, and facilitated cross-subsidization across trade sizes and customer types (Tinic and West, 1971; Friend and Blume, 1973).

Minimum commissions were determined mechanically by a published schedule that mapped observable trade characteristics into dollars of commission. The key ingredients were the number of shares and the share price, together with minimum ticket charges and stock price breakpoints that made commissions *nonlinear* in trade size. Two features matter for our empirical design. First, for a given trade-size bin (e.g., per 100 shares), the schedule implied a commission that was a deterministic function of the stock price, creating piecewise relationships between commissions and price with sharp changes in slope at known thresholds. Second, the schedule's structure implied that small orders faced particularly high *effective* per-share commissions, while larger orders were eligible for declining marginal schedules or discounts (Tinic and West, 1971; Friend and Blume, 1973).

A central advantage of the pre-1976 NYSE setting is that minimum commissions were revised repeatedly and the changes were implemented through publicly available rule schedules with clear effective dates. Jones (2001) compiles a long-run series of NYSE trading costs and documents that the Exchange altered its minimum commission schedules many times in the postwar period, with especially salient changes from the late 1960s through May Day. Two classes of rule changes are particularly relevant for our empirical strategy. First, the NYSE introduced and subsequently modified *quantity/volume discounts* that lowered marginal commissions on the portion of large orders above specified share thresholds, while leaving the baseline schedule in place for smaller trades (Jones, 2001). Second, deregulation occurred in steps before May 1975 by carving out segments of orders for negotiated commissions, effectively allowing rates to be "as mutually agreed" above specified trade-value cutoffs (and later for small orders), before the full elimination of fixed rates on May 1, 1975 (Jones, 2001; Jarrell, 1984). These revisions generate (i) sharp, deterministic nonlinearities within a given schedule and (ii) discrete time-series variation around known implementation dates.

A large empirical literature studies commission deregulation and its implications for market quality. The canonical evidence in Jones and Seguin (1997) links the sharp decline in commissions around May Day to a decline (or at least no increase) in volatility, including in difference-in-differences comparisons that use Nasdaq as a control market. Related microstructure decompositions emphasize that commissions are a first-order component of total trading costs alongside spreads and price impact, so commission reforms can materially change the all-in cost of trading even absent large changes in quoted spreads (Berkowitz et al., 1988). Turley (2012) provides a complementary mechanism and evidence linking the 1975 reforms to increased trading activity and greater price informativeness.

The May Day event bundles commission deregulation with contemporaneous changes in competition and market structure, complicating attribution in simple before–after comparisons. Our approach instead leverages (i) slope changes embedded in the published minimum schedules (supporting a regression-kink design) and (ii) repeated schedule revisions with well-defined effective dates (supporting a difference-in-differences design with event-time dynamics). The institutional record of schedule dates and phased deregulation thresholds provides a transparent mapping from observed prices and trade sizes into implied commissions, enabling tests for anticipation, adjustment dynamics, and heterogeneous responses across securities.

2.2 Commission schedules and rule changes

Our analysis relies on summaries of the NYSE minimum commission schedules, which document the timing and nature of the principal schedule revisions in our sample (Jones (2001), Appendix A). The key institutional feature is that minimum commissions were set by an exchange-prescribed schedule that mapped observable trade characteristics—most importantly the number of shares and the stock price—into a dollar commission. Because the schedule was public and mechanical, it provides a transparent mapping from prices into implied commissions within a trade-size bin and yields sharp nonlinearities (kinks and breakpoints) at known price thresholds.

For each schedule date, the NYSE published a grid of minimum charges that can be represented as a piecewise function of order size. Let p denote the stock price, q the number of shares in the order, and $V = pq$ the dollar value of the trade. Denote by $C_s(p, q)$ the minimum commission implied by schedule s. In practice, $C_s(p, q)$ is obtained by applying the schedule rules for the relevant order-size bin (e.g., per 100 shares), including any minimum ticket charge and any quantity discounts (when applicable). The implied *effective* commission rate expressed as a percentage of trade value is

$$\kappa_s(p, q) \equiv \frac{C_s(p, q)}{V}.$$

Within a fixed q bin, the schedule implies that $C_s(p, q)$ is a deterministic (often piecewise-linear) function of p, which generates the kink variation exploited by the regression kink design in the main analyses.

The NYSE revised minimum commission schedules repeatedly in the postwar era, with especially salient changes from the late 1960s through May Day. We use the schedule dates and summary descriptions compiled in Jones (2001) to define the rule-change timeline and to align each observation with the applicable schedule in our data.

Two classes of changes are central for our analysis. First, the Exchange introduced and modified *quantity/volume discounts* that lowered marginal commissions for large orders while leaving baseline minimums for smaller trades intact. A prominent example is the introduction of a volume discount beginning in December 1968, under which the minimum commission applied as usual to the first tranche of shares in an order, with a different (lower) rate applying to shares above a threshold (and subsequent revisions that adjusted thresholds and marginal rates) (Jones, 2001). Second, deregulation proceeded in steps by allowing commissions to be negotiated for particular segments of trades, effectively carving out portions of orders for "as mutually agreed" pricing. In particular, commissions on the portion of an order exceeding $500,000 became negotiable effective April 5, 1971; the negotiated threshold was lowered to the portion exceeding $300,000 effective April 24, 1972; and commissions on orders of $2,000 or less became negotiable effective April 1, 1974 (Jones, 2001). These partial carve-outs preceded the full elimination of fixed minimum commissions on May 1, 1975.

Our implementation uses each published schedule to construct implied minimum commissions for each observation given its price and order-size bin. For the regression-kink design, we focus on kink points in the mapping $p \mapsto C_s(p, q)$ within fixed q bins and estimate local changes in the slope of trading volume with respect to implied commissions around these thresholds. For the difference-in-differences design, we exploit discrete revisions to $C_s(\cdot, \cdot)$ across schedule effective dates and estimate event-time responses of volume around implementation, including tests for anticipatory trading. The mechanical nature of $C_s(p, q)$ implies that, conditional on p and q, the resulting commission changes are policy-driven rather than chosen by brokers or investors, providing the basis for our identification strategies.

2.3 Data

Our primary dataset consists of commission schedules spanning January 1, 1926 to May 1, 1975. Although information on commission rule changes is available as early as 1900, security return data in CRSP begin on January 1, 1926; accordingly, our sample starts on that date. Because the commission changes applied to securities traded on the New York Stock Exchange (NYSE), we restrict the analysis to NYSE-listed stocks. Over most of the 1926-1975 period, the NYSE was the dominant U.S. listing exchange and accounted for the vast majority of aggregate market capitalization, as shown in Appendix Figure A.1.

The detailed commission schedules—determined by stock price and time period regime—are drawn from the comprehensive breakdown in Jones (2001). We reproduce the full schedules in Appendix Figure A.2. As documented by Jones (2001), the NYSE's minimum commission rates were almost uniformly binding over this period.

The 1926 to 1975 sample period comprises 12 distinct commission regimes, depicted altogether in Figure 2. The first regime spans October 31, 1924 to January 3, 1938, and the final regime prior to the May Day deregulation event covers November 20, 1974 to May 1, 1975. We define regime start dates according to the effective dates reported in the commission schedules, as shown in Appendix Figure A.2. When a regime's stated end date coincides with the subsequent regime's start date, we treat the earlier regime as ending on the preceding day.

We also examine the effects of "May Day" using a difference-in-differences design centered on the abolition of fixed commission rates at the end of the final pre-deregulation regime (November 20, 1974 to May 1, 1975). On May 1, 1975, the SEC prohibited fixed minimum commissions on the NYSE, initiating open price competition among brokers. A contemporary SEC report estimates that large institutional investors experienced commission reductions on the order of 26 percent (expressed as percent of notional amount traded) relative to the prior fixed schedule, as brokerage pricing adjusted to competitive pressures.[5]

The removal of fixed rates substantially reduced gross commission revenues for NYSE member firms and accelerated structural change within the brokerage industry, including the expansion of discount brokerage models. In subsequent decades, trading innovations relating to the computerization of trading systems and high-speed communications networks, shift of a significant portion of trading volume from in-person exchange floors to electronic communication networks (ECNs), decimalization (Angel et al. (2010)), and elimination of commission fees intensified intermarket competition and further contributed to a transformed market structure with sustained declines in trading costs.

Our primary source of security-level data is the Center for Research in Security Prices (CRSP). We use daily data on prices, returns, share volume, bid and ask quotes, shares outstanding, identifiers, exchange codes, share class codes, and industry classifications. All variables are constructed at the daily frequency. Stock return and trading data are drawn from the CRSP Daily Stock File (dsf), from which we obtain the permno identifier of the

[5]Source: Securities and Exchange Commission, United States (1977), "The effect of the absence of fixed rates of commissions," 5th report to Congress, May 26, 1977.

stock, daily date, historical SIC code, closing price, daily return, share volume traded, bid and ask prices (including low bid and high ask), number of shares outstanding, and the cumulative adjustment factors for prices, shares outstanding, and volume to account for stock splits and other capital adjustments. We merge these data with the CRSP Stock Names file (stocknames) to obtain ticker symbols, company names, and exchange codes.

We restrict the sample to U.S. common stocks (CRSP share codes 10 and 11) listed on the NYSE (CRSP exchange code 1). Because the commission schedules apply only to securities priced at or above $1, we further require the closing price to be at least $1. Consistent with standard data filters in the literature, we exclude data points with missing volume (code -99) or with missing or otherwise invalid return (codes -66, -77, -88, and -99), and set price to the midpoint of the bid and ask prices for instances without an available close price.

We obtain daily CRSP value-weighted market returns including dividends and daily S&P 500 returns from the CRSP Monthly Stock Indexes Year-End file (msiy). Both series are measured at the daily frequency and are used as market-wide benchmarks.

We obtain stock split information from the CRSP Daily Stock Events (dse) file, restricting attention to distribution codes 5520-5529. From this file, we extract permno, event date, distribution code, and the share adjustment factor, and retain observations with non-missing permno and date and with a share adjustment factor different from one. Although stock splits mechanically reduce price, they proportionally increase shares outstanding and, absent behavioral responses, should generate a corresponding increase in share volume for a given notional amount traded (e.g., a 2-for-1 split halves price and doubles shares traded for constant notional volume). Because the commission schedule kinks are defined in terms of nominal price thresholds, splits would mechanically shift a stock across kink points, confounding changes in trading activity attributable to price-based commission discontinuities with those induced by the split itself. To avoid this identification concern, we restrict the sample to stocks that do not experience a split during the sample period.

We obtain daily factor returns for the market, size, value, profitability, and investment factors, as well as the risk-free rate, from the CRSP Fama French Portfolios 5 Factors Plus Momentum - Daily Frequency file (fivefactors_daily). All factor returns are measured at the daily frequency.

We rely on Manela and Moreira (2017) for data on news implied volatility (NVIX), a text-based proxy for option-implied volatility constructed using Wall Street Journal front page articles. While the VIX measures market-implied volatility, NVIX measures uncertainty embedded in news coverage, mapped to VIX using machine learning. A such, it can capture investor concerns as promulgated in the media, can be constructed within a specific topic of newspaper coverage, and extends implied volatility data back a century. We obtain this data from https://asafmanela.github.io/data/, and utilize both the overall NVIX series (a proxy for the VIX) and the Securities Markets series (uncertainty regarding the stock market, constructed using only the weights for stock market related n-grams) in our analysis.

In particular, we draw on the NVIX series and its Securities Markets component to measure forward-looking uncertainty and market-specific attention, respectively. NVIX provides a long-run, interpretable proxy for perceived aggregate risk that extends option-implied volatility to the pre-options era, while the Securities Markets index isolates fluctuations in uncertainty directly tied to stock market coverage. This distinction allows us to separate broad disaster-related risk from volatility arising endogenously within financial markets. By leveraging both measures, we assess how our results are impacted by general macro disaster concerns and heightened attention to securities markets.

Additional variables used in our analyses are computed based on the aforementioned sourced data. We compute stock return volatility measures based on past stock returns. Bid-ask spread is computed as the difference between ask price and the bid price. When no bid or ask price is available, bidlo and askhi values are used.

Summary statistics for the key variables employed in our analysis are shown in Table 1. As indicated, the average stock price over the period was around \$33, while the mean share volume traded was 3,939 shares and the mean dollar volume traded was \$150,459.

3 Methodology

3.1 Regression Kink Design (RKD)

The extensive differences among the commission schedules for different time periods and across varying price points provide us with a set of data points wherein the commissions of a stock experience a "kink". In particular, within a given commission regime (identified by the time period considered), a stock may have a steady fixed commission cost up until a certain price point, at which the commission may change to a different fixed commission cost or even a commission fee made up of a fixed and variable component. For instance, consider the very first regime we analyze, comprising the time period from January 1, 1926 to January 3, 1938 (non-inclusive). For any stock with a price between \$1 and \$9.875, a flat commission fee of \$7.50 was charged per 100 shares traded. As a stock entered the \$10 to \$99.875 price point range, the commission fee changed to a fixed fee of \$12.50 plus a variable component fee of 0.1% of the notional amount traded (rounded to the nearest \$2.50).[6] As a result, the commission schedule of a stock experiences a "kink" as stocks oscillate between the under \$10 and greater than or equal to \$10 price point. Analogously, there are two additional kink points at \$100 and \$200 for this first regime.

Under this setting, we apply a regression kink design (RKD) methodology to test for the impact of these commission kinks on stock trading volume. Due to the nature of the quasi experimental design, we are able to identify the causal impact of the change in commissions on investor trade.

In our RKD setup, our treatment variable is commission cost, our assignment variable is stock price, and the outcome variable is volume traded. To limit the influence of outliers, we consider the natural log of volume traded plus 1 for each stock-date observation. We investigate how both share volume traded and dollar volume traded are impacted. We focus on the change in slope of volume traded (rather than level) at the known price threshold kink points where the commission schedule changes. Instead of relying on jumps as in a standard regression discontinuity design (RDD) setup, we focus on kinks.

The key parameters of our RKD setup are listed below:

- **Assignment Variable (Prc)** — Stock price (Prc) is the assignment variable, which determines the level of treatment for a stock. In our case, stock price uniquely determines the commission that must be paid for transacting in the stock.

- **Treatment Variable (C)** — Commissions charged (C) for transacting in the stock are the treatment variable. The commission schedule is set for stocks traded on the NYSE, and differs by both time period and price point. The commissions charged in turn can affect the stock volume that is being transacted.

  Assignment to treatment occurs through a known and deterministic decision rule that depends on the assignment variable, in this case the price. In particular, commission charged in each regime would follow a set rule until a certain threshold price is reached, at which point the commissions rule changes. In a sample regime, the decision rule for treatment assignment may look as below:

$$C = C(Prc) = \begin{cases} \alpha_1 + \beta_1 Prc & \text{if } Prc \geq p' \\ \alpha_2 + \beta_2 Prc & \text{otherwise} \end{cases} \tag{1}$$

[6] Note that at this point in history, stock prices were quoted in eighths of a dollar.

where p' is a threshold price at a kink point.

Note that in some instances the commissions charged would be a fixed cost; in such cases, the beta parameter would be equal to zero. Similarly, if the entire commission is based on a variable cost depending on the stock price, the alpha parameter would be equal to zero.

- **Outcome Variable (Vol)** — The outcome variable of interest is volume traded (Vol). Since part of the cost of transacting in the stock market comes from the commission fee charged per transaction (another key cost, of course, being the bid-ask spread of the stock), it is natural to assume that the amount of transactions in a stock will depend on this cost.

- **Kink Point (p')** — The kink point refers to the threshold price value (p') at which the slope of the commission schedule changes. For each time period regime, a commission schedule would typically include several kink points. We analyze each of these regime-kink points separately first. In later analysis, we provide results for combining all of the kink points into a single pooled regression.

Since the assignment rule for commissions at each price is known, and knowing the price one can exactly predict the applicable commission rule, our design follows a Sharp RKD setup.

In particular, around each kink for each of the twelve commissions regimes, we estimate the following regression:

$$Vol_{i,t} = \alpha + \beta * Prc_{i,t} + \gamma * (Prc_{i,t} > p') * Prc_{i,t} + \epsilon_{i,t} \tag{2}$$

where $Vol_{i,t}$ is the share volume traded of stock i on day t, or the abnormal share volume traded of stock i on day t with respect to the stock's average daily share trading volume and standard deviation of share trading volume using data over the preceding year in the case of alternative specifications used in the Appendix of the paper. $Prc_{i,t}$ is the deterministic price of the stock i on day t, computed as the closing price using CRSP data. p' is the threshold price at the kink point, which is specific to the regime-kink point pair for which the RKD analysis is run.

We employ a corresponding specification to test the impact of commission changes on dollar volume traded. In particular, the specification we employ is:

$$VolDol_{i,t} = \alpha + \beta * Prc_{i,t} + \gamma * (Prc_{i,t} > p') * Prc_{i,t} + \epsilon_{i,t} \tag{3}$$

where all of the variables are defined as in the specification above but $VolDol_{i,t}$ is the log dollar volume traded for stock i on day t.

Around each price threshold kink point, we are thus able to estimate the difference in slope around the kink point. We divide this estimated difference by the known difference in the slope of the commission schedule around the kink point, in order to arrive at the elasticity of volume traded to commissions.

3.2 Difference-in-Differences (DiD)

The second key approach we take is a difference-in-differences analysis that focuses on commission changes before and after a commission regime change.

$$Vol_{i,t} = \alpha + \beta * \Delta C_{i,t} + \gamma * Post_t * \Delta C_{i,t} + \epsilon_{i,t} \tag{4}$$

where $Vol_{i,t}$ is the volume traded variable of interest for stock i on day t, ΔC is commission change for stock i on day t expressed as a percentage point change in commissions after vs. before the commission regime change, and $Post_t$ is an indicator variable equal to 1 if time t is after the commission regime change and 0 otherwise.

We build a similar specification to analyze the impact of May Day on trading volume. In this case, we estimate the following model:

$$Vol_{i,t} = \alpha + \gamma * Post_t^{MayDay} * I_i^{HC} + \epsilon_{i,t} \tag{5}$$

where $Vol_{i,t}$ is the volume traded variable of interest for stock i on day t, $I_{i,t}^{HC}$ is an indicator variable for whether stock i had an above median commission prior to May Day (i.e. had a relatively high commission charge prior to the deregulation event), and $Post_t^{MayDay}$ is an indicator variable equal to 1 if time t is after the May Day commission deregulation regime change (May 1, 1975) and 0 otherwise. We use the time period preceding May Day (in the last available commission regime prior to May 1, 1975) in order to estimate stock characteristics used in the analysis as control variables. In addition, we include a wide range of fixed effects including stock fixed effects, price bin ($10) fixed effects, stock-price bin ($10 and $1 in various specifications) fixed effects, and date fixed effects. We cluster standard errors by stock and day.

4 Empirical Results

4.1 RKD Results

The results of the main RKD specifications are shown in Table 2. We perform a separate regression kink design analysis for each commission regime, which in this case we term as a time period-price point kink pair. For example, the first regime we consider is the commission schedule time period ending in 1938 for a price point of $10. We estimate an elasticity of 0.151, indicating that as a 1% increase in commission fees corresponds to a 15 basis points (bps) increase in trading volume. We find that the relationship between commission and trading volume is positive for the majority of the regimes, indicating that brokers may have been successfully steering their clients into more expensive stocks, thereby sustaining more lucrative transactions for the brokers themselves.

The results presented in Table 2 report the results for the main RKD specification we follow. In an alternative specification, we also analyze the effect of commission rate changes on demeaned log share volume, to account for heterogenous base volume traded rates. The results of this analysis are shown in Appendix Table A.6.

We also analyze the impact of commission changes on dollar volume traded. Figure 5 depicts the results. As the figure illustrates, across all specifications the relation between commissions and dollar volume traded is positive.

Consequently, we find that as commission fees increased, trading volume also experienced a corresponding increase. As we detail more in the mechanism section, this effect can likely be attributed to a cartel type environment among the broker dealers operating as market makers in the time preceding the May Day deregulation of commissions. Indeed, as evidenced in Figure 3, dollar trading volume experienced a steep increase starting around 1950, significantly before the well known commission deregulation event took place.

4.2 DiD Results

In a second set of empirical analyses, we investigate the impact of commission fee schedule changes on trading volume through a set of difference-in-differences regressions. As outlined in the methodology section, we consider the differences before and after a commission fee schedule regime change. In this way, we complement our cross-sectional style RKD analysis which compares stocks at various price points to other stocks at the same point in time with this exercise which investigates the effect before and after a given commission regime change.

Table 4 reports the results of our main difference-in-differences specifications. In this table, we analyze the impact of commission rule changes on log share volume, abnormal log share volume traded (expressed as a z score), log dollar volume traded, and abnormal log dollar volume traded (expressed as a z score). We find that a one percentage increase in the commission change for a stock corresponds to an increase of approximately 0.113% in its share volume traded. Analogously, a 10 percentage point increase in the commission change would correspond to an increase in share volume of 1.13%. For context regarding economic magnitude, the mean commission change is 23.63 percentage points.

We next turn to an analysis of the effect of the largescale commission deregulation that occurred on May Day for trading volume. In a similar DiD setup, we find that as Table **??** reports, stocks with relatively higher commissions pre-May Day experienced a larger increase in volume traded. For instance, stocks with relatively higher commissions experienced a 0.264 higher abnormal dollar volume traded z-score following the commission deregulation than did below median commission cost stocks. This finding supports the thesis that May Day successfully helped dispel some of pre-existing collusion occurring among broker-dealers in steering customers towards higher fee stocks, and successfully led to increased trading volume across stocks (and particularly the previously higher commission stocks) following the event.

5 Imperfect Competition and Steering in the Brokerage Sector

Our estimates imply a positive elasticity of trading volume with respect to minimum commissions, a result that is difficult to reconcile with conventional economic relations between costs and demand. In this section, we develop a mechanism that connects fixed minimum commission schedules to anti-competitive intermediation and brokerage steering. The core idea is that a binding commission floor can sustain supracompetitive brokerage rents and thereby strengthen brokers' incentives to direct investor attention toward trades and securities that are particularly profitable to intermediate. This channel naturally generates (i) larger commission–volume effects in stocks where speculative opportunities are easier to market—notably more volatile stocks—and (ii) rising brokerage revenues when volume expands, without a commensurate competitive response in the form of entry.

5.1 Fixed minimum commissions as an anti-competitive regime

Contemporary analyses of the pre–May Day NYSE emphasize that fixed minimum commissions restricted price competition in brokerage services and sustained brokerage rents. Tinic and West (1971) and Friend and Blume (1973) argue that minimum schedules functioned as a binding floor that protected incumbent broker-dealers, facilitated cross-subsidization across order sizes and customer types, and weakened competitive pressure on the retail-facing margin. Historical accounts further link the phased dismantling of fixed rates to regulatory and competitive forces, highlighting the expansion of discount brokerage once commissions became negotiable Jarrell (1984).

This institutional environment is important for interpretation. When posted fees are fixed and broadly applied, brokerage firms compete less on *price* and more on *non-price* dimensions such as sales effort, marketing, and customer acquisition. In such a regime, increases in the minimum commission can raise the profitability of steering investors toward trades that generate high commission dollars, potentially increasing turnover even as the direct per-trade wedge rises.

5.2 A model of broker steering under a commission floor

This subsection develops a stylized mechanism linking NYSE minimum commissions to higher retail trading volume through broker steering. The key ingredients are: (i) a binding commission floor that generates per-share brokerage rents, (ii) heterogeneity in retail investors' attention to commissions, and (iii) broker promotion effort that increases the salience/dispersion of perceived trading opportunities—especially in volatile, "lottery-like" stocks. We state the model and its main implication here; derivations, regularity conditions, and proofs are provided in Appendix A.

Environment. Consider a stock s with payoff $v_s \sim \mathcal{N}(\theta_s, \sigma_s^2)$. Retail investors trade through a broker (or cartel) that faces a binding NYSE minimum commission per share $c_s \geq 0$ and a per-share execution/resource cost $\kappa \in [0, c_s)$. The broker can expend promotion/attention effort $e_s \geq 0$ at cost $\frac{\phi}{2} e_s^2$.

A unit mass of retail investors trades through the broker. A fraction $\mu \in (0, 1]$ are *naïve* and under-internalize commissions: they perceive only $(1 - \eta)c_s$ of the commission, where $\eta \in [0, 1]$ indexes inattention ("shrouding"). The remaining fraction $1 - \mu$ are fee-aware and internalize c_s fully. Investors are mean–variance with absolute risk aversion $\gamma > 0$.

Perceived opportunities and volatility. Broker promotion affects retail trading by increasing the *dispersion* of perceived opportunities among naïve investors rather than mechanically raising average expected returns. Formally, naïve investors perceive an "alpha" term

$$\alpha_s \;=\; \theta_s \;+\; \lambda(\sigma_s)\, e_s \;\; + \varepsilon, \qquad \varepsilon \sim \mathcal{N}(0,1), \tag{6}$$

where $\lambda(\sigma_s) > 0$ captures the effectiveness of steering and is increasing in idiosyncratic volatility:

[Volatility amplifies persuasion] $\lambda : \mathbb{R}_+ \to \mathbb{R}_+$ is differentiable and satisfies $\lambda'(\sigma_s) > 0$.

Retail trading intensity. Given perceived alpha realization $\tilde{\alpha}$ and per-share cost f, a mean–variance investor chooses

$$x(\tilde{\alpha}, f) \;=\; \frac{\tilde{\alpha} - f}{\gamma \sigma_s^2}. \tag{7}$$

Because (6) is mean-zero around θ_s, broker effort does not increase *average signed* demand. Instead, it increases *turnover/volume* by raising the expected *absolute* size of trades placed by naïve investors. We therefore proxy retail volume by expected absolute demand:

$$V_s(e_s, c_s) \;\equiv\; \chi \Bigg[(1-\mu)\; |x(\theta_s,\; c_s + \kappa)| \;+\; \mu\; |x(\theta_s + \lambda(\sigma_s) e_s \varepsilon,\; (1-\eta) c_s + \kappa)| \Bigg], \tag{8}$$

for some $\chi > 0$ mapping positions into volume.

Broker problem. With a binding commission floor, the broker earns a per-share margin $(c_s - \kappa)$ on executed retail volume. Profits are

$$\Pi_s(e_s; c_s) \;=\; (c_s - \kappa)\, V_s(e_s, c_s) \;-\; \frac{\phi}{2} e_s^2. \tag{9}$$

The broker chooses e_s taking c_s as given.

[Commission rents, steering, and volatility] Suppose Assumption 5.2 holds and the broker chooses an interior optimum $e_s^{\star}(c_s, \sigma_s) > 0$. Then:

(i) (*Steering*) $V_s(e_s, c_s)$ is increasing in broker effort e_s.

(ii) (*Commission–volume link*) A higher commission floor can increase volume through higher equilibrium steering:

$$\frac{V_s(e_s^\star(c_s,\sigma_s),c_s)}{c_s} = \underbrace{\frac{\partial V_s}{\partial e_s}\frac{e_s^\star}{c_s}}_{\text{steering }(+)} + \underbrace{\frac{\partial V_s}{\partial c_s}}_{\text{fee salience }(-)},$$

and the total effect is positive when the steering component dominates the direct fee-salience component.

(iii) (*Volatility amplification*) The commission–volume effect is larger for more volatile stocks: $\frac{\partial}{\partial \sigma_s}(V_s/c_s) > 0$.

Proposition 5.2 provides a simple rationale for our empirical findings. A binding minimum commission schedule acts like a collusive device guaranteeing a per-share margin. Brokers optimally convert this rent into promotion/steering effort, which increases naïve turnover by making perceived opportunities more salient. Because persuasion is more effective for volatile stocks, the model predicts stronger commission–volume effects in high-volatility names, consistent with Figure 7. All derivations and proofs are in Appendix A.

5.3 Commissions and volume: Effects of volatility

The steering mechanism makes a sharp cross-sectional prediction: commission increases should raise trading most strongly in stocks where it is easiest to induce speculative trading, proxied by volatility. Figure 7 provides direct support for this implication. Across multiple volatility-related measures—including return volatility and dollar-volume volatility—the estimated implementation effect is substantially larger in the top quartile than in the bottom quartile. The same pattern holds when we proxy for the news/attention environment using exposure to a news-implied volatility index (NVIX): stocks with higher exposure exhibit stronger volume responses.

This heterogeneity is difficult to reconcile with a pure "liquidity demand" story in which higher commissions simply reflect a larger wedge that should discourage trade uniformly. Instead, it is consistent with a reallocation mechanism in which higher commission rents induce brokers to intensify sales effort precisely where persuasion is most effective.

5.4 Brokerage revenues and limited competitive response

A further implication of the anti-competitive interpretation is that higher commissions should be associated with sustained brokerage rents. We provide suggestive evidence by constructing historical proxies for brokerage commission revenue per broker and per principal using SEC registration reports combined with the commission schedules.

Figure 9 shows that estimated commission revenue per broker/principal rises sharply during periods when aggregate dollar volume increases. This co-movement is consistent with the model's rent channel: when trading expands in response to high-commission steering, brokerage revenue scales up mechanically with commissions and volume.

Importantly, this pattern does not appear to be offset by an immediate competitive response that would dissipate rents. If entry and expansion were rapid and unconstrained, one would expect rising per-broker revenues to attract entry and erode profitability. Instead, the combined evidence—rising revenue measures alongside our broader historical discussion of the fixed-commission regime—is consistent with limited price competition and frictions to competitive discipline in brokerage during the pre–May Day period.

6 Conclusion

This paper studies how brokerage commissions affect trading activity in a setting where commissions vary for reasons plausibly orthogonal to contemporaneous shocks in investor demand and firm fundamentals. Prior to the dismantling of fixed rates in 1976, the NYSE set minimum commission schedules that mapped observable trade characteristics—most prominently share price—into deterministic fees, and the Exchange revised these schedules repeatedly over time. This institutional structure delivers two complementary sources of quasi-experimental variation. First, the piecewise-linear schedule generates slope changes that we exploit in a regression kink design. Second, the discrete regime revisions allow a difference-in-differences design that compares affected and less-affected stocks around implementation.

Across both designs, we find that higher minimum commissions increase trading volume. In the regression kink design, the estimated commission-volume elasticity is positive and economically meaningful. The difference-in-differences also yields positive relations, with the dynamic effects showing that trading adjusts around the announcement and continues to build after the new schedule becomes the operating environment. The effects are not uniform: they are substantially larger for more volatile stocks and for stocks with greater exposure to news-implied volatility, a pattern that is difficult to reconcile with a benchmark view in which commissions operate solely as a wedge that scales down trading demand.

We interpret these results through the lens of imperfect competition and broker steering. When posted fees are fixed and broadly applied, price competition in brokerage services is muted and rents are sustained on retail-facing intermediation. In such an environment, higher commission floors can increase the profitability of brokerage effort, expanding speculative turnover among investors who underweight trading costs—especially in securities where volatility makes perceived opportunities easier to market. Consistent with this interpretation, we provide suggestive evidence that brokerage revenues rise with commission-induced volume while competitive responses are limited. More broadly, the findings underscore that the effect of trading costs on market activity depends on how those costs interact with the industrial organization of intermediation and with investor attention. This lesson is naturally relevant to modern retail markets where explicit commissions have fallen, but compensation has shifted toward less salient margins: changing the form of fees need not eliminate the incentives that shape retail trading intensity and the composition of order flow.

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Tables

	Mean	Median	SD	N
Price	32.991	25.125	39.527	12545177
Share volume	3938.768	900.000	12815.366	12545177
Dollar volume	150459.091	21525.000	682563.384	12545177
Ln(share volume)	6.254	6.804	2.802	12545177
Ln(dollar volume)	9.377	9.979	3.075	12545177
Commission fee per 100 shares	26.260	22.938	14.650	12545177
Bid–ask spread	0.031	0.017	0.066	12545154
Daily return	0.001	0.000	0.032	12542875
Market capitalization	2.106e+08	36562500.000	1.043e+09	12545177

Table 1: **Summary Statistics.** This table reports summary statistics at the stock level. Our sample is drawn from Center for Research in Security Prices (CRSP) at daily frequency covering from 1926 to 1980. We restrict the sample to common stocks incorporated in the US, and to stocks that are traded on the New York Stock Exchange (NYSE). No winsorization is imposed. Price is the closing price or the negative bid/ask average for a trading day, and is reported in units of one dollar. Share volume is the total raw number of shares of a stock traded on that day, and is not adjusted for splits during the month and does not contain over-allotments, and is reported in units of one share. Dollar volume is the total value of a stock traded on that day, and is reported in units of one dollar. Ln(share volume) is the natural logarithm of share volume, and is calculated as $ln(share\ volume + 1)$. Ln(dollar volume) is the natural logarithm of dollar volume, and is calculated as $ln(dollar\ volume + 1)$. Commission fee per 100 shares is the commission fee charged by trading 100 shares of the stock, and is reported in units of one dollar. The bid-ask spread is calculated as $(ask - bid)/((ask + bid)/2)$ (and uses the daily highs and lows to estimate the spread when the ask and bid prices are missing), and is reported in percent. Daily return is the change in the total value of an investment in the stock over the given day, and is reported in percent. Market capitalization is the total value of shares outstanding, and is reported in units of one dollar.

Regime	Kink	Slope change	RKD Est	SE of RKD Est	Elasticity	SE of Elasticity	Obs
1938	10	-2.303	-.347	.146	.151	.064	164762
1947	10	-.693	.088	.126	-.127	.182	203890
1947	40	-1.609	-.031	.025	.019	.015	152739
1953	20	-.693	-.002	.041	.002	.059	157276
1953	50	-1.609	-.003	.018	.002	.011	89697
1958	4	-.693	.72	.888	-1.039	1.281	15517
1958	22	-.693	-.007	.052	.01	.075	45330
1958	50	-1.609	-.058	.033	.036	.02	41301
1959	4	-.693	1.247	.59	-1.798	.852	51684
1959	24	-.693	.054	.036	-.078	.052	200615
1959	50	-1.609	-.132	.029	.082	.018	50486
1968	4	-.693	-21.641	.715	31.222	1.032	295
1968	24	-.693	-.054	.034	.078	.048	101907
1968	50	-1.609	-.01	.016	.006	.01	66356
1970	4	-.693	1.182	.537	-1.706	.775	20541
1970	50	-1.609	-.111	.025	.069	.016	30488
1972	8	-.431	-.023	.097	.054	.224	68842
1972	25	-.368	-.059	.036	.162	.097	88021

Table 2: **Regression Kink Design (RKD) Estimates: An Example of Preferred Estimator.** This table reports regime-level Regression Kink Design (RKD) estimates of trading volume elasticity with respect to the commission rate. Each row corresponds to a specific commission regime-kink pair. Regime denotes the commission schedule in effect, and Kink indicates the breakpoint in the commission schedule where the marginal commission rate changes. Slope change reports the change in the marginal commission rate at the kink. RKD Est is the estimated kink in demeaned $ln(dollar\ volume)$ at the specified breakpoint, obtained from Equation 2. SE of RKD Est reports the associated standard error. Elasticity rescales the RKD estimate by the slope change to obtain the implied elasticity of demanded dollar volume with respect to the commission rate, and SE of Elasticity reports its standard error. Obs reports the number of observations used in the local estimation around each kink. All estimations use the mean squared error-optimal regression discontinuity (MSERD) bandwidth selector and a triangular kernel. The outcome variable is demeaned within each commission regime. Each regime-level estimate is obtained from local polynomial regressions of order 1 on both sides of the kink. Regularization is imposed. Estimates are bias-corrected and robust bias-corrected standard errors are reported.

	(1) Ln(dollar volume)	(2) Ln(dollar volume)	(3) Ln(dollar volume)
Commission change	-0.00145***	-0.00331**	-0.000694
	(0.000442)	(0.00148)	(0.00126)
Post * Commission change	0.00113***	0.00117***	0.00101***
	(0.000348)	(0.000317)	(0.000282)
Constant	13.00***	13.06***	12.97***
	(0.0102)	(0.0499)	(0.0419)
Value-weighted	Yes	Yes	Yes
Event FE	Yes		
Stock FE	Yes		
Price-bin (10)FE	Yes		
Event-stock-price bin (10)FE		Yes	
Event-stock-price bin (1)FE			Yes
Date FE	Yes	Yes	Yes
Cluster	Stock Date	Stock Date	Stock Date
Observations	1031319	1031184	1029529

Table 3: **DiD Commissions Rule Change Implementation Effect.** This table reports the regression results of Equation (4), which studies the implementation effect of the commission rule change on trading volume. Commission change is the percentage point change in commissions after vs. before a given commission rule change took place. The commission change percent is calculated separately at each price level for each stock. All estimates are value-weighted. Column (1) includes event FE, stock FE, price bin (10) FE, and date FE. Column (2) include event-stock-price bin (10) FE, and date FE. Column (3) include event-stock-price bin (1) FE, and date FE. The sample period range is 3 months before to 11 months after each commission reform. The standard errors are clustered at stock and date level. Standard errors are included in parentheses. *, **, and *** designate significance levels at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Fwd: baseline	Fwd: one lag	Fwd: three lags	Fwd: HAC(1)	Fwd: HAC(3)	Rev: baseline
Lag 1: delta log(volume)	358.527**	387.001**	384.245**	358.527**	358.527**	-0.007
	(144.381)	(150.376)	(152.790)	(151.860)	(143.592)	(0.140)
Lag 2: delta log(volume)	-62.983		-47.171	-62.983	-62.983	
	(227.264)		(238.517)	(229.260)	(230.838)	
Lag 3: delta log(volume)			200.024			
			(120.732)			
Lag 1: delta registrations	0.603***	0.551**	0.587***	0.603***	0.603***	-0.000*
	(0.205)	(0.212)	(0.190)	(0.194)	(0.210)	(0.000)
Lag 2: delta registrations						0.000
						(0.000)
Joint test p-value	0.022	0.013	0.032	0.036	0.025	0.185
Observations	47	48	46	47	47	47

Table 4: **Lead-lag Test: Brokerage Registration and Volume.** This table reports the regression results of Equation (**??**), which studies the lead-lag relation of brokerage registration and dollar volume traded. Delta log(volume) is the first difference of the log(dollar volume), and delta registration is the first difference of brokerage registrants. Columns (1)â(5) report forward regressions in which changes in registrations are regressed on lagged changes in brokerage registrations and lagged changes in trading volume. Column (1) reports the baseline specification including two lags of delta log(volume) and one lag of delta registration. Column (2) reports specification including one lag of delta log(volume) and one lag of delta registration. Column (3) reports specification including three lags of delta log(volume) and one lag of delta registration. Columns (4) and (5) report the baseline specification with heteroskedasticity and autocorrelation consistent (HAC) standard errors using different lag lengths. Column (6) reports the reverse regression, where changes in log(dollar volume) are regressed on lagged changes in trading volume and lagged changes in registrations, to test whether brokerage registrations predict subsequent trading volume. The joint test p-value reports the significance of the lagged delta log(volume) terms in column (1) - (5), and the significance of the lagged delta brokerage registrations terms in column (6). Newey-West adjusted standard errors are included in parentheses. *, **, and *** designate significance levels at 10%, 5%, and 1%, respectively.

Figures

Figure 1: **Commission Schedules: An Example of a Commission Schedule for Nov. 9, 1953 – April 30, 1958.** This figure plots the commission schedule in effect between November 9, 1953 and April 30, 1958 for trades of 100 shares. The horizontal axis reports the stock price, and the vertical axis reports the total dollar commission cost associated with buying or selling 100 shares at that price.

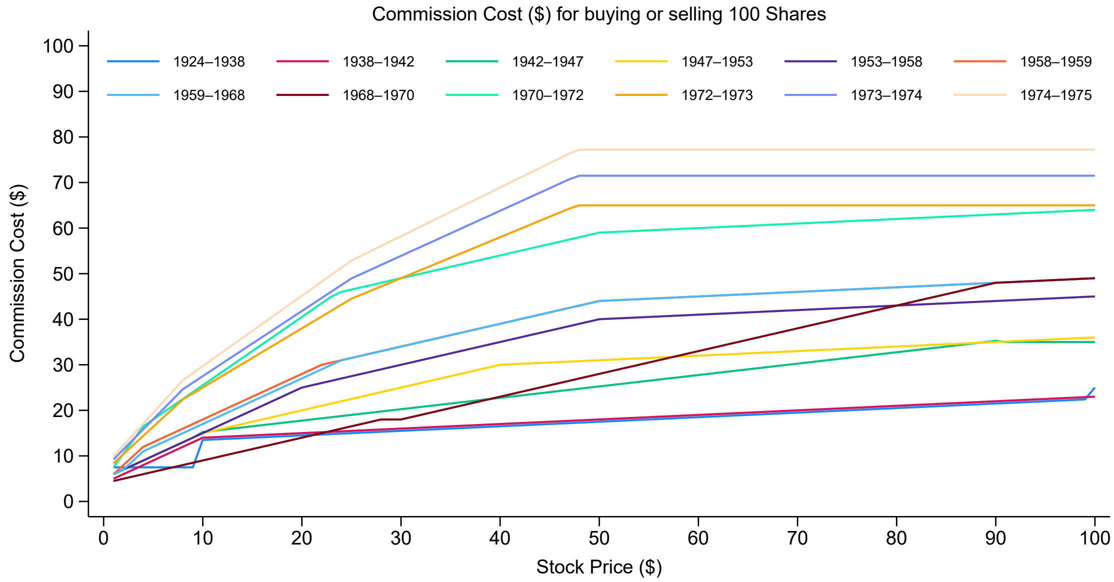


Figure 2: **Commission Schedules: Full Spectrum.** This figure plots the full set of commission schedules applied to trades of 100 shares over the sample period. The horizontal axis reports the stock price, and the vertical axis reports the total dollar commission cost associated with buying or selling 100 shares at that price. Each line corresponds to a distinct commission schedule in effect over the indicated date range, as shown in the legend.

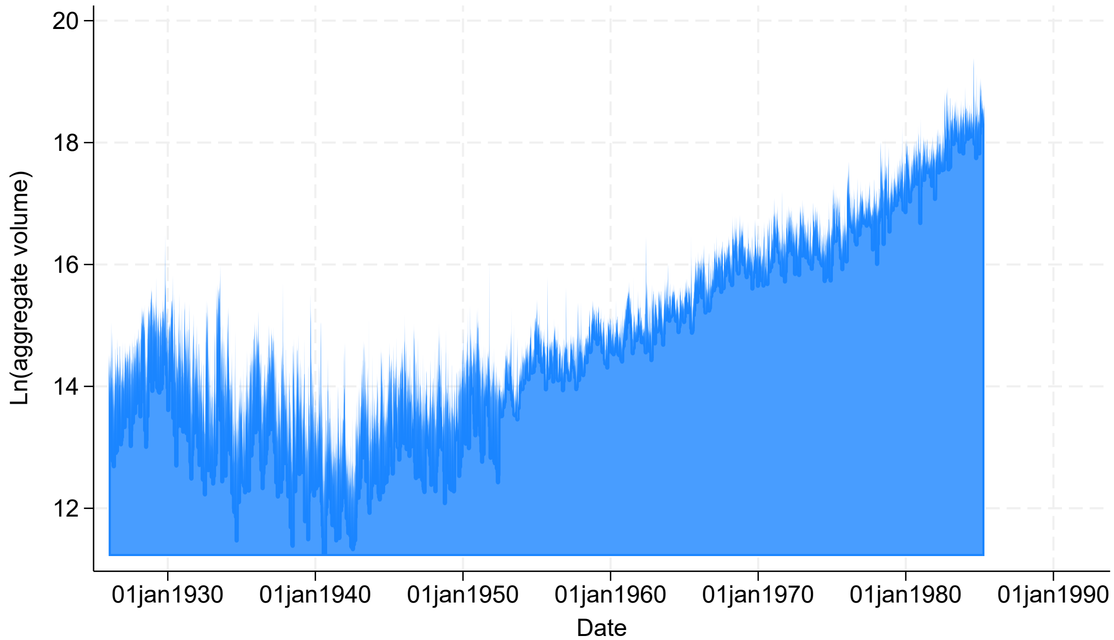


Figure 3: **Aggregate Volume over Time.** This figure plots aggregate trading volume over time across all stocks in the sample. The horizontal axis reports the date, and the vertical axis reports the logarithm of aggregate trading volume. Aggregate trading volume is constructed by summing that day's dollar trading volume across all stocks and then taking the natural logarithm.

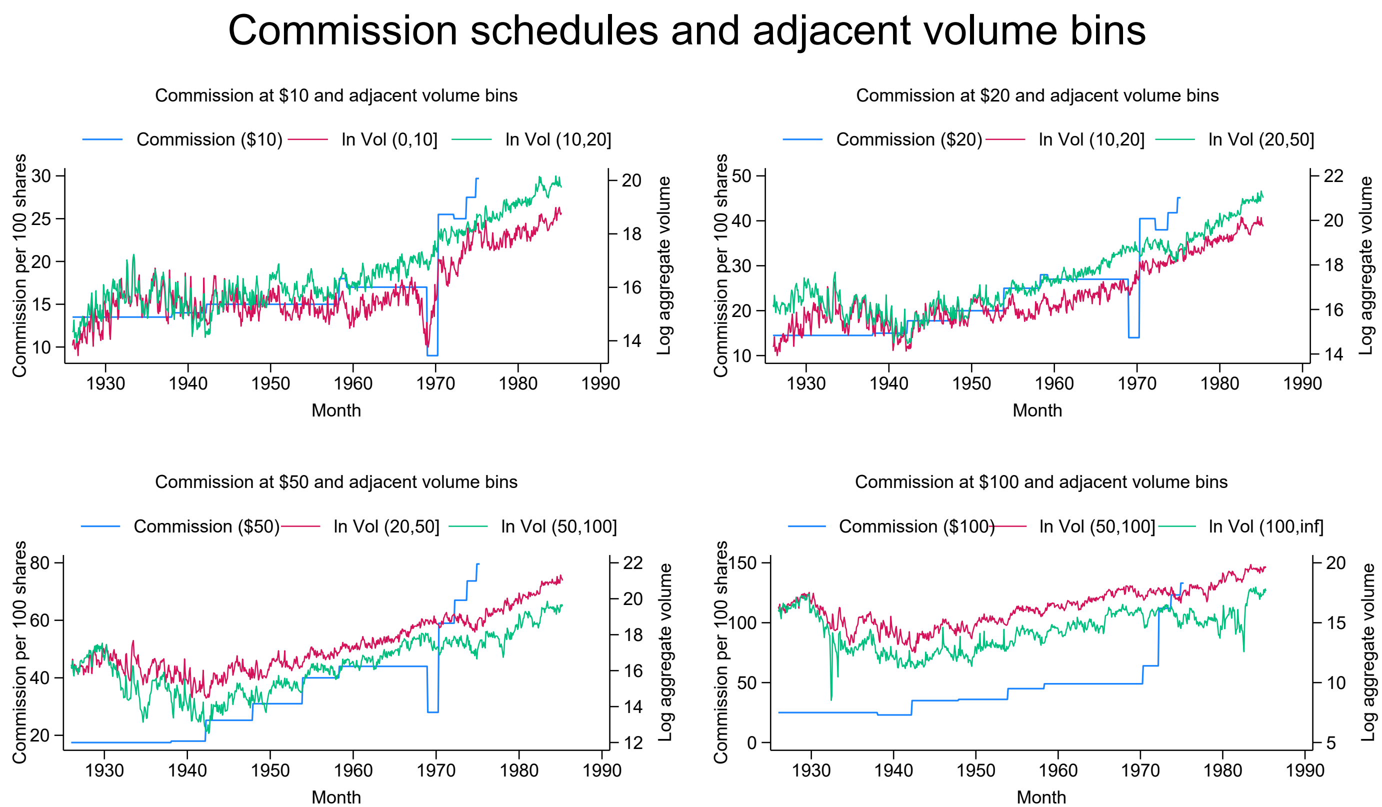


Figure 4: **Commission Schedules and Aggregate Trading Volume in Adjacent Price Bins.** This figure plots commission schedules and aggregate trading volume in adjacent price bins over time. Each panel corresponds to a commission schedule kink at a given price level ($10, $20, $50, and $100, respectively). In each panel, the left vertical axis reports the commission cost per 100 shares at the indicated price threshold, while the right vertical axis reports the logarithm of aggregate trading volume. The blue line in each panel shows the commission schedule evaluated at the corresponding price threshold. The colored lines show aggregate trading volume for stocks whose prices fall into the two adjacent price bins surrounding the kink. Bins are defined by stock prices immediately below and above the kink, as indicated in the panel legends.

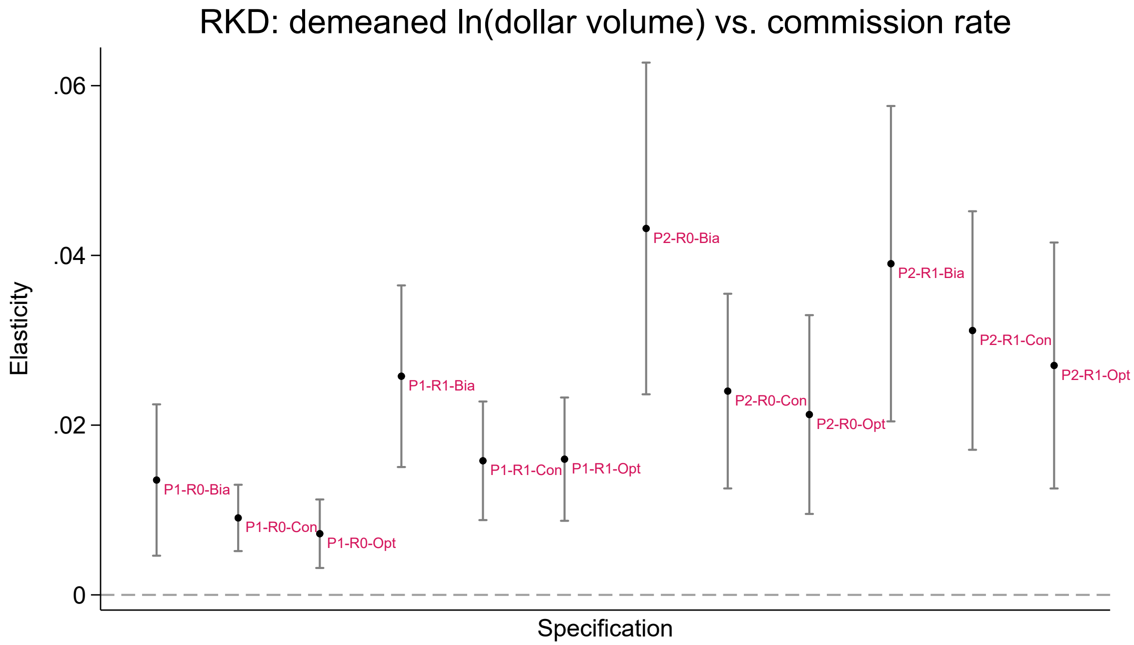


Figure 5: **Regression Kink Design (RKD): Elasticity of Demeaned Log Dollar Volume with Respect to Commission Rate.** This figure reports the estimation results of Equation 3 - the elasticity of demeaned $ln(dollar\ volume)$ with respect to commission rate. The $ln(dollar\ volume)$ is demeaned within each of the commission regimes. Each dot and its correspondent confidence interval represents the estimation result of one model specification. We use mean squared error-optimal regression discontinuity (MSERD) bandwidth selector and triangular kernel function for all specifications, while varying polynomial orders, regularization choices, and bias correction choices across specifications. P1 refers to polynomial order 1, and P2 refers to polynomial order 2. R0 refers to opting out regularization, and R1 refers to opting in regularization. Bias refers to bias-corrected estimate and standard error (SE), Con refers to conventional estimate and SE without adjusting for bias, Opt refers to optimal choice of bias-correction regarding optimal mean squared error (based on tradeoff between bias and variance) for each estimation. For example, P1-R0-Bia – the far left specification – means the estimation uses polynomial order 1 function (linear) to fit data on both side of the cutoff, does not impose regularization for curved data around the cutoff, and does not adjust for bias. Each result of the specifications is a meta result of many RKD estimations of different kinks for which it weights different kink estimations by their inverse variance.

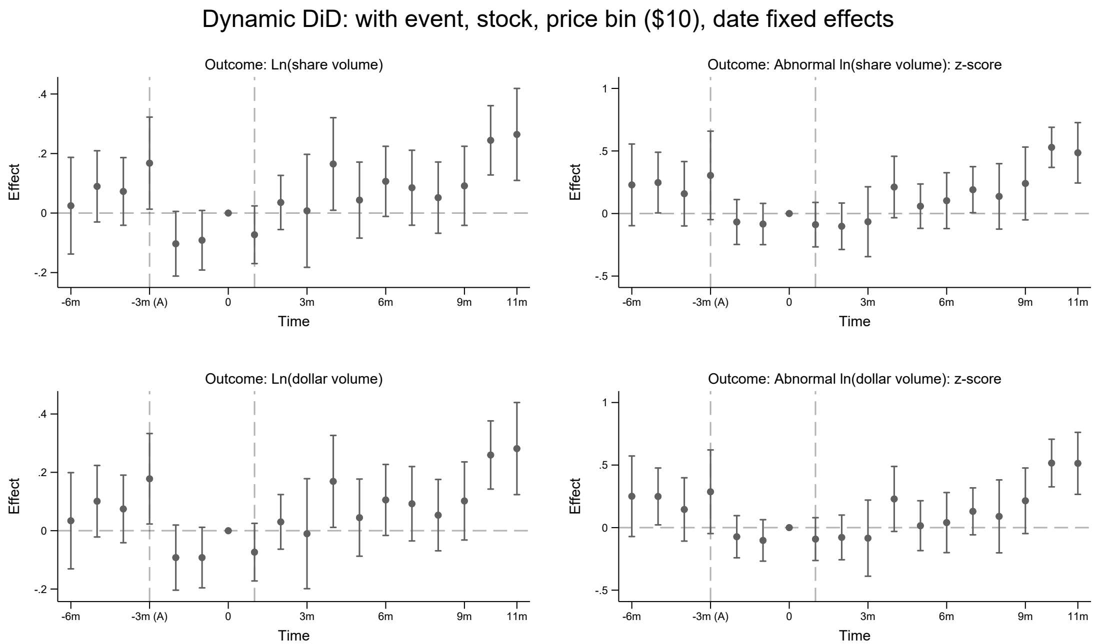


Figure 6: **Difference in Differences Dynamics: Specification 1** This figure reports the regression results of Equation (??) - the dynamics of the implementation effect of the commission reforms on trading volumes. There are four panels. The top left panel uses $ln(share\ volume)$ as the dependent variable. The top right panel uses abnormal $ln(share\ volume)$ as the dependent variable. The bottom left panel uses $ln(dollar\ volume)$ as the dependent variable. The bottom right panel uses abnormal $ln(dollar\ volume)$ as the dependent variable. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 7 months before to 10 months after each commission reform. Confidence interval is reported at significance level of 5%.

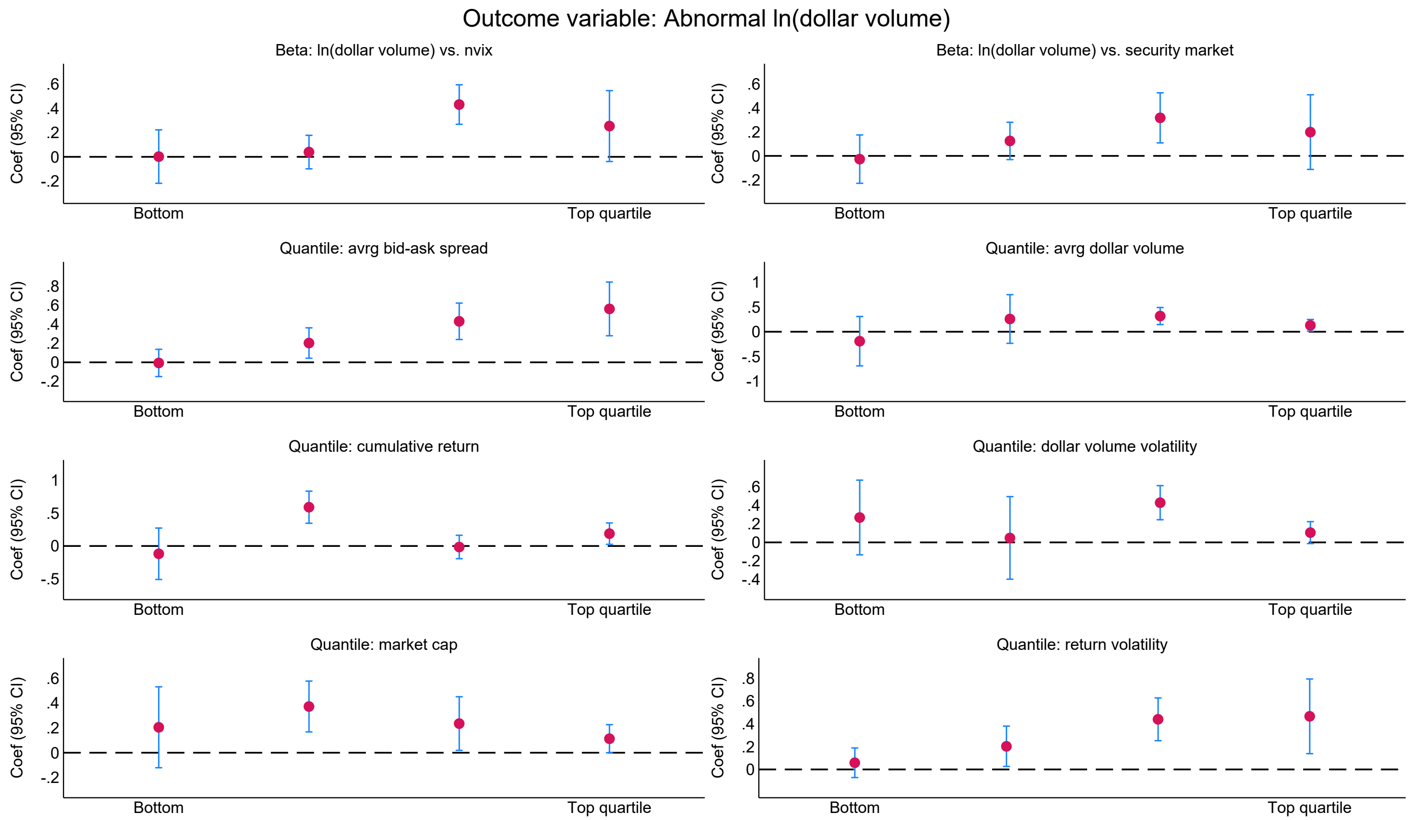


Figure 7: **Difference in Differences: Heterogeneity in Stock Characteristics: Specification 1.** This figure reports the regression results of Equation (??) - the implementation effect of the commission reforms on abnormal $ln(dollar\ volume)$ across stock characteristics. We explored the heterogeneity in eight stock characteristics. The top left panel uses stock's exposure to news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX$. The top right panel uses stock's exposure to the security market component of the news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX : security\ market$. The third panel uses average bid-ask spread. The fourth panel uses dollar volume. The fifth panel uses cumulative return. The sixth panel uses dollar volume volatility. The bottom left panel uses market capitalization of the shares outstanding. The bottom right panel uses return volatility. For stock's exposure to NVIX, we use data three years prior to the commission change. And for the rest of the characteristics, we use data one year prior to the commission change. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 3 months before to 11 months after each commission reform. Confidence interval is reported at significance level of 5%.

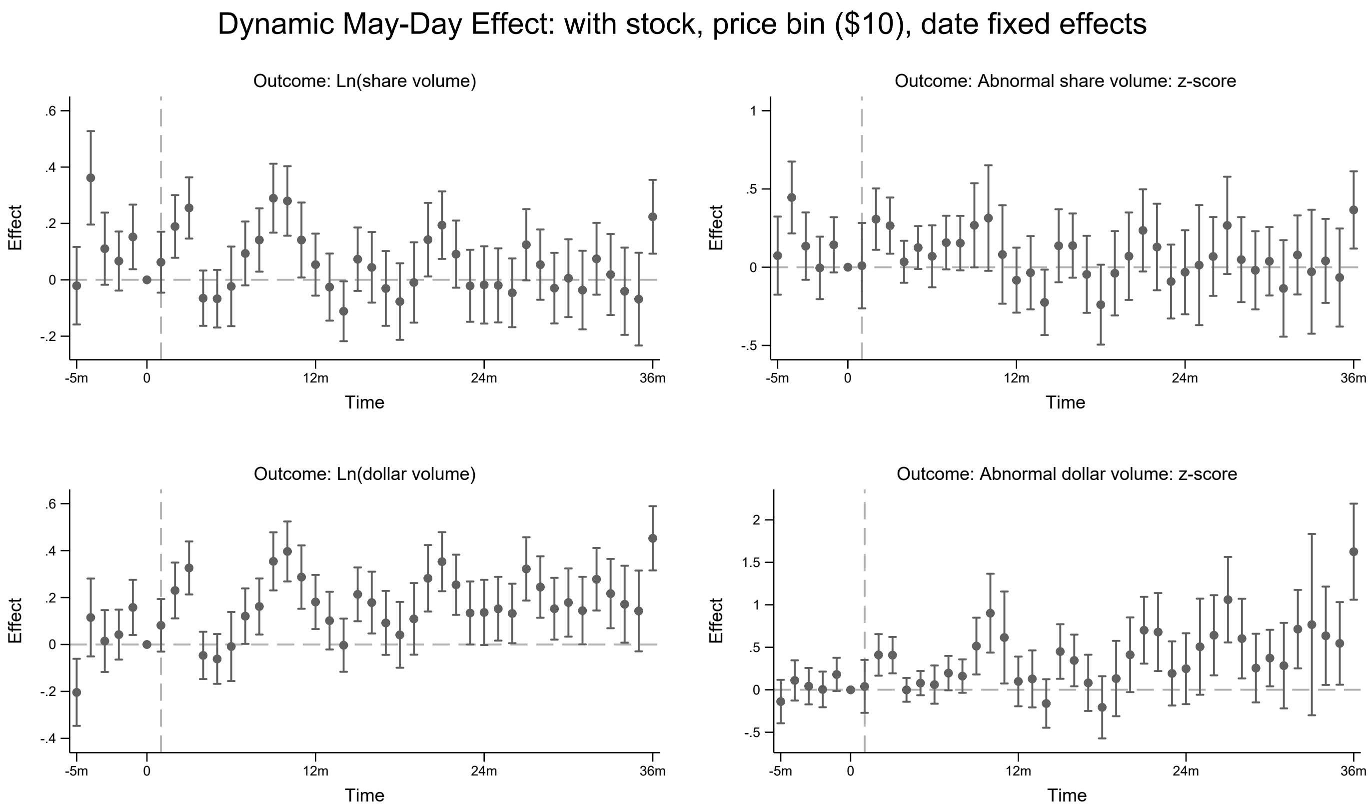


Figure 8: **Impact of May Day on Trading Volume: Specification 1.** This figure reports dynamic difference-in-differences estimates of the impact of the May Day deregulation on trading volume. The horizontal axis reports event time in months relative to May Day, with month 0 indicating the baseline. The vertical axis reports the estimated treatment effect. All specifications include stock fixed effects, price-bin fixed effects at the $10 level, and date fixed effects. There are four panels. The top left panel uses ln(share volume) as the dependent variable. The top right panel uses abnormal share volume, defined as a z-score standardized by the stockâs one-year mean and one-year standard deviation prior to May Day. The bottom left panel uses ln(dollar volume) as the dependent variable. The bottom right panel uses abnormal ln(dollar volume), constructed analogously. Error bars report 95% confidence intervals.

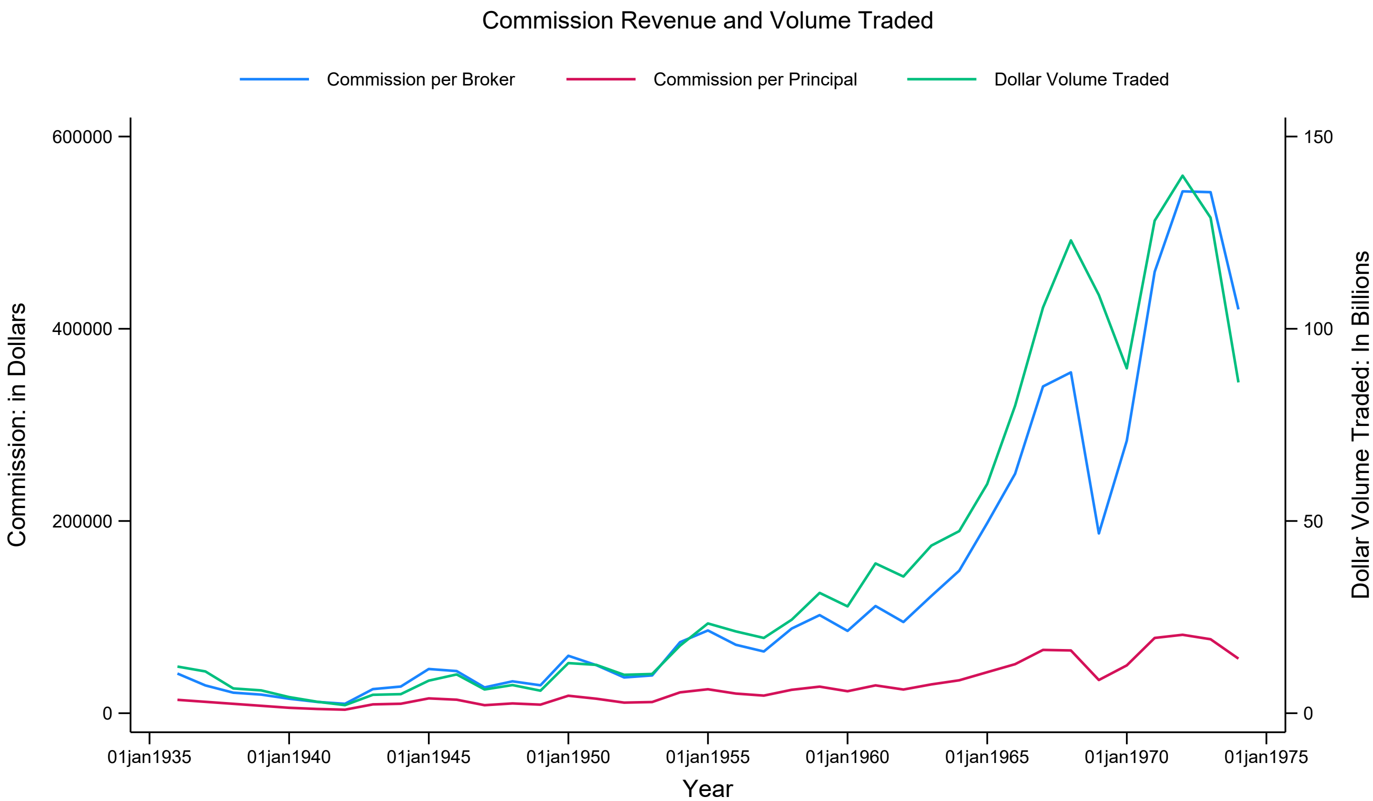


Figure 9: **Commission Revenue and Dollar Volume Traded** This figure plots the evolution of broker-dealer commission revenue and aggregate dollar trading volume over time. Commission per broker summarizes commission revenue per broker company over time. Commission per principal summarizes commission revenue per principal over time. Dollar volume traded summarizes the aggregate dollar volume trade over time. The left vertical axis reports commission assuming the total trades are divided into orders of 100 shares, while the right vertical axis reports aggregate dollar volume traded, measured in billions of dollars. The horizontal axis reports calendar time.

A Theory Appendix: Broker Steering Under a Commission Floor

This appendix provides derivations and proofs for the steering model in Section 5.2. Throughout, $\varepsilon \sim \mathcal{N}(0,1)$ and $\Phi(\cdot)$ and $\varphi(\cdot)$ denote the standard normal CDF and PDF.

A.1 Retail volume proxy and closed-form expressions

In the main text, retail volume is proportional to expected absolute demand:

$$V_s(e,c) = \chi\Big[(1-\mu)|x(\theta_s, c+\kappa)| + \mu|x(\theta_s + \lambda(\sigma_s)e\varepsilon, (1-\eta)c+\kappa)|\Big],$$

with mean–variance demand $x(\tilde{\alpha}, f) = (\tilde{\alpha} - f)/(\gamma\sigma_s^2)$.

Define

$$m_A(c) \equiv \theta_s - (c+\kappa), \qquad m_N(c) \equiv \theta_s - ((1-\eta)c+\kappa), \qquad \sigma_\alpha(e,\sigma_s) \equiv \lambda(\sigma_s)e.$$

Then

$$|x(\theta_s, c+\kappa)| = \frac{|m_A(c)|}{\gamma\sigma_s^2}, \qquad |x(\theta_s + \sigma_\alpha(e,\sigma_s)\varepsilon,\ (1-\eta)c+\kappa)| = \frac{1}{\gamma\sigma_s^2}|m_N(c) + \sigma_\alpha(e,\sigma_s)\varepsilon|.$$

[Mean absolute normal] If $Z \sim \mathcal{N}(m,\sigma^2)$, then

$$|Z| = \sigma\sqrt{\frac{2}{\pi}}\exp\left(-\frac{m^2}{2\sigma^2}\right) + m\left(2\Phi\left(\frac{m}{\sigma}\right) - 1\right). \tag{10}$$

Moreover, $\partial|Z|/\partial\sigma > 0$ and $\partial^2|Z|/\partial\sigma^2 < 0$ for $\sigma > 0$.

Proof. Standard; see, e.g., properties of the folded normal distribution. Differentiation of (10) yields the monotonicity and concavity in σ.

A.2 Broker problem: existence, uniqueness, and effort comparative statics

The broker chooses effort to maximize

$$\Pi_s(e;c) = (c-\kappa)V_s(e,c) - \frac{\phi}{2}e^2.$$

[Concavity and interior optimum] Holding (c, σ_s) fixed, $e \mapsto \Pi_s(e;c)$ is strictly concave on $\mathbb{R}_+$ and admits a unique maximizer $e^\star(c, \sigma_s) \geq 0$. If $(c-\kappa)\partial V_s/\partial e|_{e=0} > 0$, then $e^\star(c, \sigma_s) > 0$.

Proof. By Lemma A.1, $|m_N(c) + \lambda(\sigma_s)e\varepsilon|$ is increasing and concave in e because it is increasing and concave in $\sigma_\alpha = \lambda(\sigma_s)e$. Hence $V_s(e,c)$ is concave in e. Subtracting $\frac{\phi}{2}e^2$ yields strict concavity and uniqueness. The interior condition follows from the sign of the derivative at zero.

[FOC] If $e^\star(c, \sigma_s) > 0$, it is characterized by the first-order condition

$$(c-\kappa)\frac{\partial V_s}{\partial e}(e^\star, c) = \phi e^\star. \tag{11}$$

Proof. Immediate from strict concavity (Lemma A.2).

[Effort increasing in the commission floor] Fix σ_s. If $e^\star(c, \sigma_s) > 0$, then $\partial e^\star/\partial c \geq 0$.

Proof. Write the objective as $\Pi_s(e;c) = (c-\kappa)G(e,c) - \frac{\phi}{2}e^2$ where $G(e,c) = V_s(e,c)$. Holding e fixed, $(c-\kappa)$ scales the marginal return to effort. Under concavity, the argmax is increasing in the scale parameter by standard monotone comparative statics (equivalently, Π_s has increasing differences in (e,c) through the multiplicative term). A direct implicit-function proof follows by differentiating (11) and using $\partial^2\Pi_s/\partial e^2 < 0$.

A.3 Decomposition of the commission effect on volume

Let $e^\star(c, \sigma_s)$ denote the unique optimum. The total effect of c on equilibrium volume decomposes as

$$\frac{V_s(e^\star(c, \sigma_s), c)}{c} = \frac{\partial V_s}{\partial e}\frac{\partial e^\star}{\partial c} + \frac{\partial V_s}{\partial c}. \tag{12}$$

The first term is the (positive) steering channel. The second term captures direct fee salience: because $m_N(c) = \theta_s - ((1-\eta)c + \kappa)$ and $m_A(c) = \theta_s - (c+\kappa)$ decrease in c, the direct effect is weakly negative.

[Signs] For $e > 0$, $\partial V_s/\partial e > 0$. Moreover, $\partial V_s/\partial c \leq 0$.

Proof. The first claim follows from Lemma A.1: increasing $\sigma_\alpha = \lambda(\sigma_s)e$ increases $|m_N + \sigma_\alpha \varepsilon|$, hence increases V_s. The second claim follows because c enters only through $m_A(c)$ and $m_N(c)$ with negative sign; increasing c weakly reduces absolute demand holding e fixed.

A.4 Volatility amplification

We show that the commission–volume relationship is stronger in more volatile stocks when persuasion is more effective in volatility (Assumption 5.2). Intuitively, higher σ_s strengthens the steering channel because the same increment in effort produces a larger increment in opportunity dispersion.

[Volatility amplifies the commission effect] Suppose $\lambda'(\sigma_s) > 0$ (Assumption 5.2) and $e^\star(c, \sigma_s) > 0$. Then

$$\frac{\partial}{\partial \sigma_s}\left(\frac{V_s(e^\star(c, \sigma_s), c)}{c}\right) > 0$$

under the sufficient condition that $\partial^2 V_s/(\partial e\, \partial \sigma_s) \geq 0$ and $\partial^2 e^\star/(\partial c\, \partial \sigma_s) \geq 0$.

Proof. Differentiate (12) with respect to σ_s:

$$\frac{\partial}{\partial \sigma_s}\left(\frac{V}{c}\right) = \underbrace{\frac{\partial^2 V}{\partial \sigma_s \partial e}\frac{\partial e^\star}{\partial c}}_{\geq 0} + \underbrace{\frac{\partial V}{\partial e}\frac{\partial^2 e^\star}{\partial \sigma_s \partial c}}_{\geq 0} + \underbrace{\frac{\partial^2 V}{\partial \sigma_s \partial c}}_{\text{typically small}},$$

where all partial derivatives are evaluated at $(e^\star(c, \sigma_s), c)$. The first term is nonnegative because $\partial^2 V/(\partial e\, \partial \sigma_s) \geq 0$ when $\lambda'(\sigma_s) > 0$ (effort becomes more productive in volatile stocks) and $\partial e^\star/\partial c \geq 0$ (Lemma A.2). The second term is nonnegative when $\partial^2 e^\star/(\partial c\, \partial \sigma_s) \geq 0$, i.e., when the response of effort to commission rents is stronger at higher volatility. The third term reflects direct fee effects; it does not overturn the result under the stated sufficient condition.

Online Appendix

B Empirical Robustness

This appendix provides empirical robustness tests for main analyses presented in the paper.

	(1) Abnormal ln(dollar volume): z-score	(2) Abnormal ln(dollar volume): z-score	(3) Abnormal ln(dollar volume): z-score
Commission change	-0.00177***	-0.00295	0.000629
	(0.000609)	(0.00302)	(0.00219)
Post * Commission change	0.00134**	0.00146**	0.00136***
	(0.000565)	(0.000587)	(0.000488)
Constant	0.0325*	0.0698	-0.0506
	(0.0176)	(0.101)	(0.0726)
Value-weighted	Yes	Yes	Yes
Event FE	Yes		
Stock FE	Yes		
Price-bin (10)FE	Yes		
Event-stock-price bin (10)FE		Yes	
Event-stock-price bin (1)FE			Yes
Date FE	Yes	Yes	Yes
Cluster	Stock Date	Stock Date	Stock Date
Observations	1031316	1031181	1029526

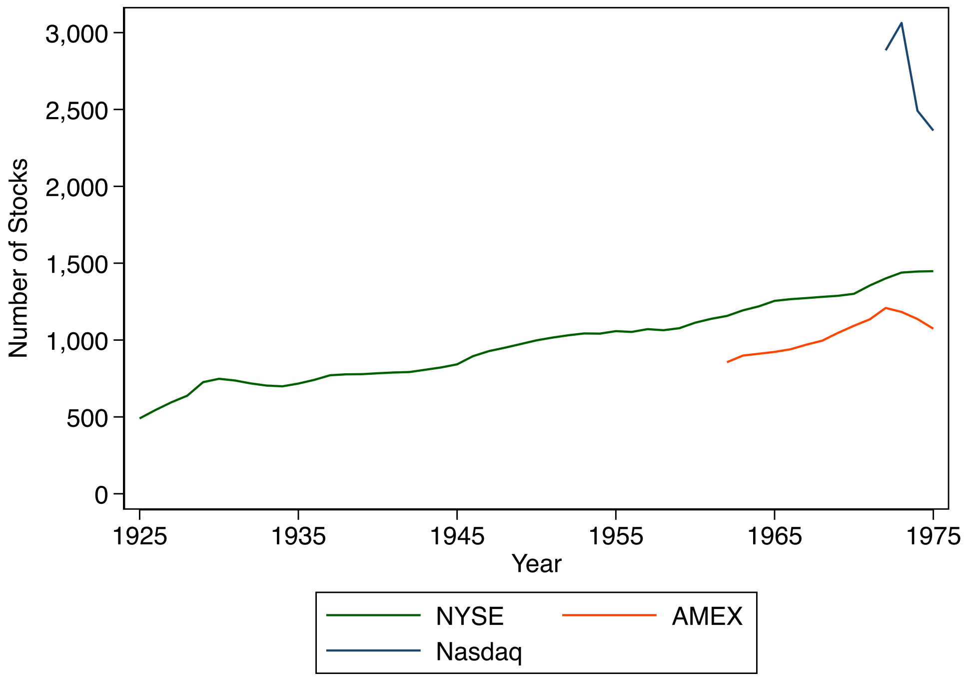
Table A.1: **DiD Implementation Effect: Robust 1.** This table reports the regression results of Equation (4), which studies the implementation effect of the commission rule change on trading volume. Commission change is the percentage point change in commissions after vs. before a given commission rule change took place. The commission change percent is calculated separately at each price level for each stock. All estimates are value-weighted. Column (1) includes event FE, stock FE, price bin (10) FE, and date FE. Column (2) include event-stock-price bin (10) FE, and date FE. Column (3) include event-stock-price bin (1) FE, and date FE. The sample period range is 3 months before to 11 months after each commission reform. The standard errors are clustered at stock and date level. Standard errors are included in parentheses. *, **, and *** designate significance levels at 10%, 5%, and 1%, respectively.

	(1) Ln(share volume)	(2) Ln(share volume)	(3) Ln(share volume)
Commission change	-0.00139***	-0.000807	-0.0000956
	(0.000429)	(0.00168)	(0.00126)
Post * Commission change	0.00113***	0.00106***	0.00101***
	(0.000337)	(0.000307)	(0.000282)
Constant	9.247***	9.228***	9.205***
	(0.0100)	(0.0561)	(0.0421)
Value-weighted	Yes	Yes	Yes
Event FE	Yes		
Stock FE	Yes		
Price-bin (10)FE	Yes		
Event-stock-price bin (10)FE		Yes	
Event-stock-price bin (1)FE			Yes
Date FE	Yes	Yes	Yes
Cluster	Stock Date	Stock Date	Stock Date
Observations	1031319	1031184	1029529

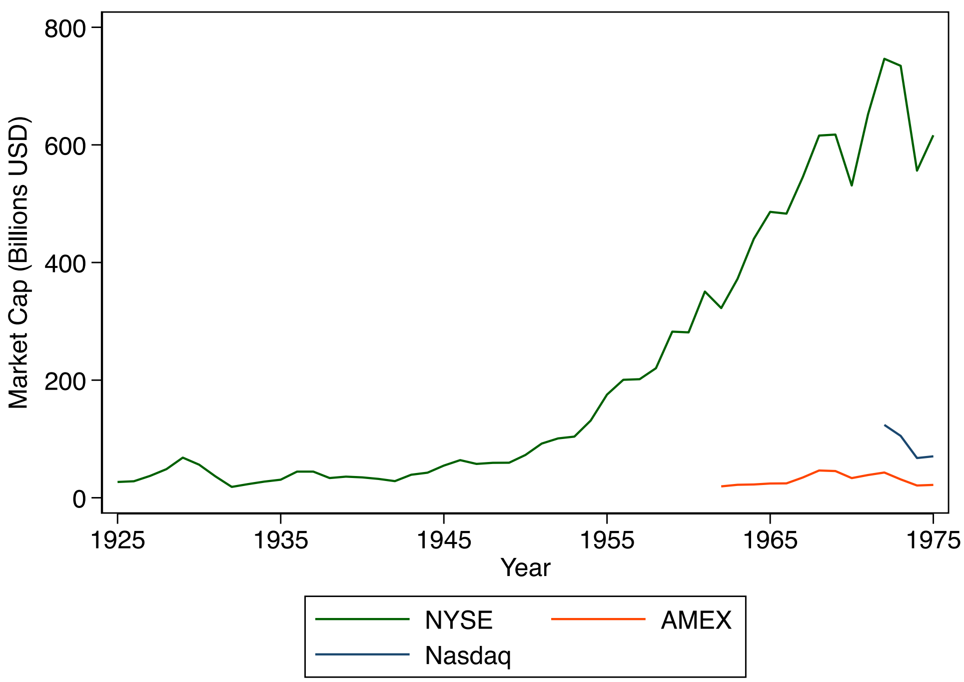
Table A.2: **DiD Implementation Effect: Robust 2.** This table reports the regression results of Equation (4), which studies the implementation effect of the commission rule change on trading volume. Commission change is the percentage point change in commissions after vs. before a given commission rule change took place. The commission change percent is calculated separately at each price level for each stock. All estimates are value-weighted. Column (1) includes event FE, stock FE, price bin (10) FE, and date FE. Column (2) include event-stock-price bin (10) FE, and date FE. Column (3) include event-stock-price bin (1) FE, and date FE. The sample period range is 3 months before to 11 months after each commission reform. The standard errors are clustered at stock and date level. Standard errors are included in parentheses. *, **, and *** designate significance levels at 10%, 5%, and 1%, respectively.

	(1) Abnormal ln(share volume): z-score	(2) Abnormal ln(share volume): z-score	(3) Abnormal ln(share volume): z-score
Commission change	-0.00164***	0.00109	0.00164
	(0.000558)	(0.00338)	(0.00223)
Post * Commission change	0.00143***	0.00140**	0.00140***
	(0.000538)	(0.000556)	(0.000483)
Constant	0.0508***	-0.0415	-0.0611
	(0.0160)	(0.112)	(0.0743)
Value-weighted	Yes	Yes	Yes
Event FE	Yes		
Stock FE	Yes		
Price-bin (10)FE	Yes		
Event-stock-price bin (10)FE		Yes	
Event-stock-price bin (1)FE			Yes
Date FE	Yes	Yes	Yes
Cluster	Stock Date	Stock Date	Stock Date
Observations	1031316	1031181	1029526

Table A.3: **DiD Implementation Effect: Robust 3.** This table reports the regression results of Equation (4), which studies the implementation effect of the commission rule change on trading volume. Commission change is the percentage point change in commissions after vs. before a given commission rule change took place. The commission change percent is calculated separately at each price level for each stock. All estimates are value-weighted. Column (1) includes event FE, stock FE, price bin (10) FE, and date FE. Column (2) include event-stock-price bin (10) FE, and date FE. Column (3) include event-stock-price bin (1) FE, and date FE. The sample period range is 3 months before to 11 months after each commission reform. The standard errors are clustered at stock and date level. Standard errors are included in parentheses. *, **, and *** designate significance levels at 10%, 5%, and 1%, respectively.



(A) Number of Listed Stocks by Exchange (1925-1975)



(B) Total Market Cap by Exchange (1925-1975)

Figure A.1: **Number and Market Cap of Stocks by Exchange.** This figure plots the number of stocks (Panel A) and total market cap of stocks (Panel B) by stock market exchange over 1925 to 1975 (inclusive). Exchanges included are the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and the National Association of Securities Dealers Automated Quotations (Nasdaq). Data comes from CRSP and is for U.S. incorporated stocks.

NYSE minimum commissions prior to May 1975 for all stocks with a share price at least $1

19th century to at least 1902

Minimum commission was 0.125% of the par value of the shares

Pre-War to May 7, 1919

Share price	Minimum commission per 100 shares
$1 to $9.875	$6.25
$10 and over	$12.50

May 8, 1919 to October 30, 1924

Share price	Minimum commission per 100 shares
$1 to $9.875	$7.50
$10 to $124.875	$15
$125 and over	$20

October 30, 1924 to January 3, 1938

Share price	Minimum commission per 100 shares
$1 to $9.875	$7.50
$10 to $99.875	$12.50 + 0.1% of amount traded, rounded down to the nearest $2.50
$100 to $199.875	$25
$200 and over	$10 + 0.1% of amount traded, rounded down to the nearest $5

January 3, 1938 to March 16, 1942

Share price	Minimum commission per 100 shares
$1 to $10	$4 + 1% of amount traded
Over $10	$13 + 0.1% of amount traded, rounded down to the nearest $1.00

March 16, 1942 to November 3, 1947

Share price	Minimum commission per 100 shares
$1 to $10	$5 + 1% of amount traded
$10 to $90	$12.75 + 0.25% of amt. traded, rounded down to the nearest $0.25
Over $90	$35

Figure A.2: **Full Commission Schedules, 1900-1975.** This figure lists the minimum commissions for trading stocks listed on the New York Stock Exchange (NYSE) over the time period ranging from the 19th century to May 1, 1975. Commissions listed represent the minimum dollar commission fee for trading 100 shares of a stock at varying price point levels and different points in time. This commission schedule can be fully attributed to the extensive work of Jones (2001). Source: Jones (2001)

November 3, 1947 to November 9, 1953

Share price	Minimum commission per 100 shares
\$1 to \$10	\$5 + 1% of amount traded
\$10 to \$40	\$10 + 0.5% of amount traded
Over \$40	\$26 + 0.1% of amount traded (with a \$50 maximum)

November 9, 1953 to May 1, 1958

Share price	Minimum commission per 100 shares
\$1 to \$20	\$5 + 1% of amount traded
\$20 to \$50	\$15 + 0.5% of amount traded
Over \$50	\$35 + 0.1% of amount traded (with a \$50 maximum)

May 1, 1958 to March 30, 1959

Share price	Minimum commission per 100 shares
\$1 to \$4	\$4 + 2% of amount traded
\$4 to \$22	\$8 + 1% of amount traded
\$22 to \$50	\$19 + 0.5% of amount traded
Over \$50	\$39 + 0.1% of amount traded (with a \$75 maximum)

March 30, 1959 to December 5, 1968

Share price	Minimum commission per 100 shares
\$1 to \$4	\$3 + 2% of amount traded (with a \$6 minimum)
\$4 to \$24	\$7 + 1% of amount traded
\$24 to \$50	\$19 + 0.5% of amount traded
Over \$50	\$39 + 0.1% of amount traded (with a \$75 maximum)

December 5, 1968 to April 6, 1970

On the first 1,000 shares of an order, the minimum commission remains unchanged.

Share price	Minimum commission per 100 shares on shares in excess of 1,000
\$1 to \$28	\$4 + 0.5% of amount traded
\$28 to \$30	\$18
\$30 to \$90	\$3 + 0.5% of amount traded
Over \$90	\$39 + 0.1% of amount traded

except that the minimum commission for an order is never to exceed \$100,000.

Figure A.2: **Full Commission Schedules, 1900-1975 (cont.).**

April 6, 1970 to March 24, 1972

Share price	Minimum per 100 shares on the first 1,000 shares of an order
\$1 to \$4	\$4.50 + 3% of amount traded
\$4 to \$23	\$10.50 + 1.5% of amount traded
\$23 to \$24	\$22 + 1% of amount traded
\$24 to \$50	\$34 + 0.5% of amount traded
Over \$50	\$54 + 0.1% of amount traded (with a \$75 maximum)

On shares in excess of 1,000 per order, the minimum commission remains unchanged. Effective April 5, 1971, the commission on the portion of an order exceeding \$500,000 may be negotiated between broker and customer.

March 24, 1972 to September 25, 1973

Share price	Minimum for orders of 100 shares
\$1 to \$8	\$6.40 + 2% of amount traded
\$8 to \$25	\$12 + 1.3% of amount traded
Over \$25	\$22 + 0.9% of amount traded (with a \$65 maximum)

Money involved	Minimum for multiple round-lot orders
\$100 to \$2,500	\$12 + 1.3% of amount traded
\$2,500 to \$20,000	\$22 + 0.9% of amount traded
\$20,000 to \$30,000	\$82 + 0.6% of amount traded
\$30,000 to \$300,000	\$142 + 0.4% of amount traded

On multiple round-lot orders, there is an additional charge for each round lot of 100 shares:

\$6.00 per round lot for the first to tenth round lot

\$4.00 per round lot for the eleventh round lot and above

The minimum commission on each round lot in a multiple round-lot order cannot exceed the minimum commission for a 100-share order.

Effective April 5, 1971, the commission on the portion of an order exceeding \$500,000 may be negotiated between broker and customer.
Effective April 24, 1972, the commission on the portion of an order exceeding \$300,000 may be negotiated between broker and customer.

September 25, 1973 to November 19, 1974

The minimum increased by 10% on orders up to \$5,000 and by 15% on orders between \$5,000.01 and \$300,000.
Effective April 1, 1974, on orders of \$2,000 or less, the commission was as mutually agreed.

November 19, 1974 to May 1, 1975

The minimum increased by an additional 8% on orders over \$5,000.

Figure A.2: **Full Commission Schedules, 1900-1975 (cont.).**

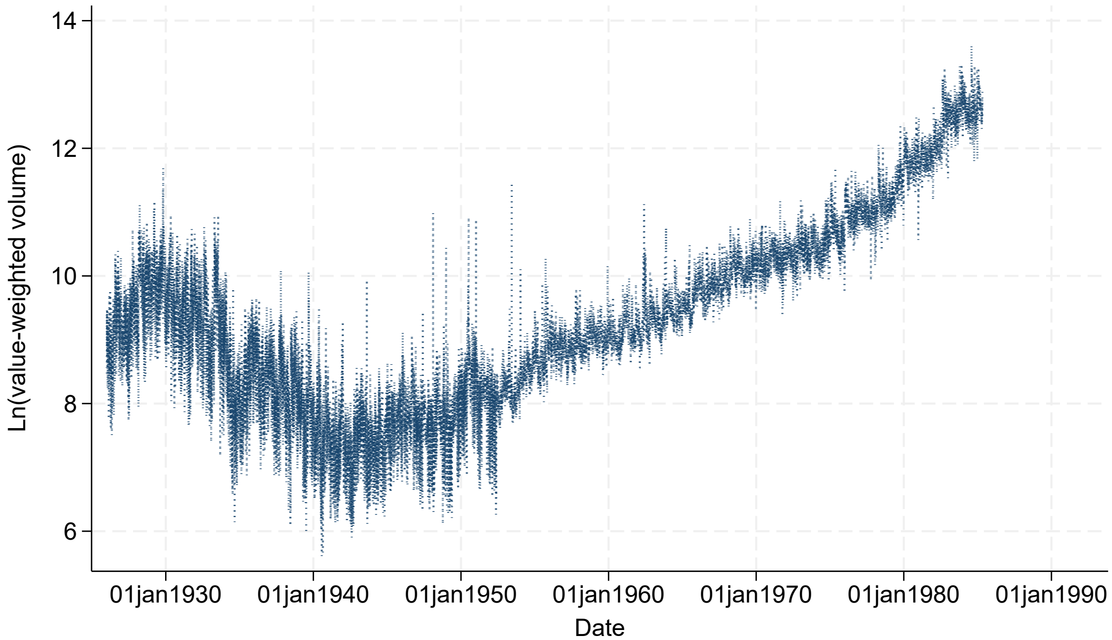


Figure A.3: **Value-Weighted Trading Volume over Time.** This figure plots value-weighted aggregate trading volume over time. The horizontal axis reports calendar time, and the vertical axis reports the natural logarithm of value-weighted aggregate trading volume. Aggregate volume is constructed by value-weighting individual stocks' dollar trading volume and summing across stocks on each date, followed by taking the natural logarithm.

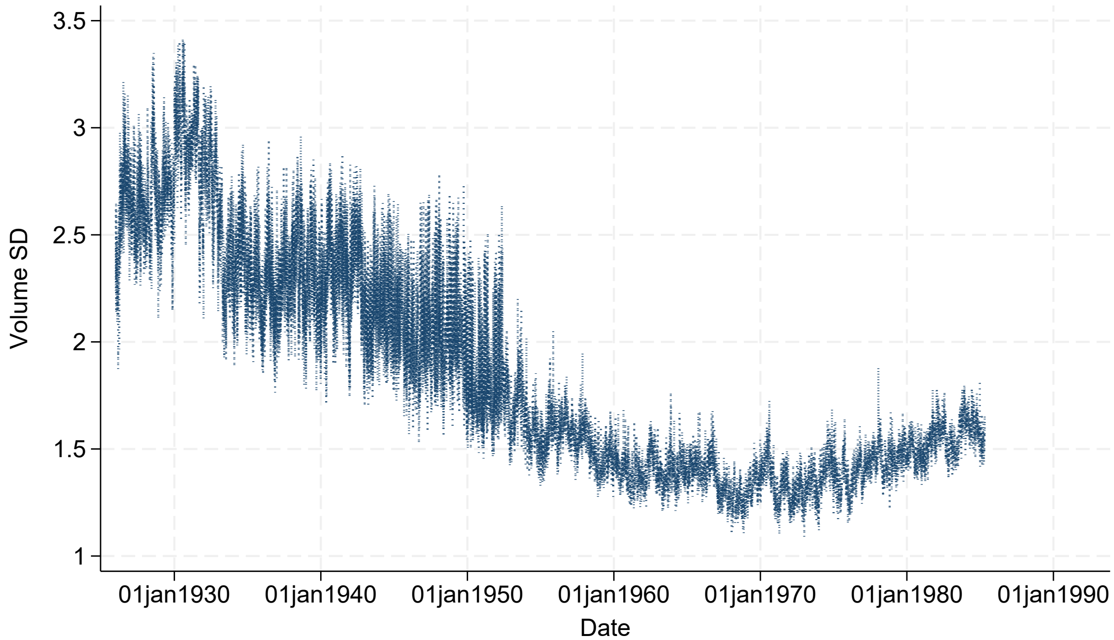


Figure A.4: **Cross-Sectional Dispersion of Trading Volume over Time.** This figure plots the cross-sectional dispersion of trading volume over time. The horizontal axis reports calendar time, and the vertical axis reports the cross-sectional standard deviation of trading volume across stocks on each date. Trading volume is measured at the stock-day level prior to any normalization.

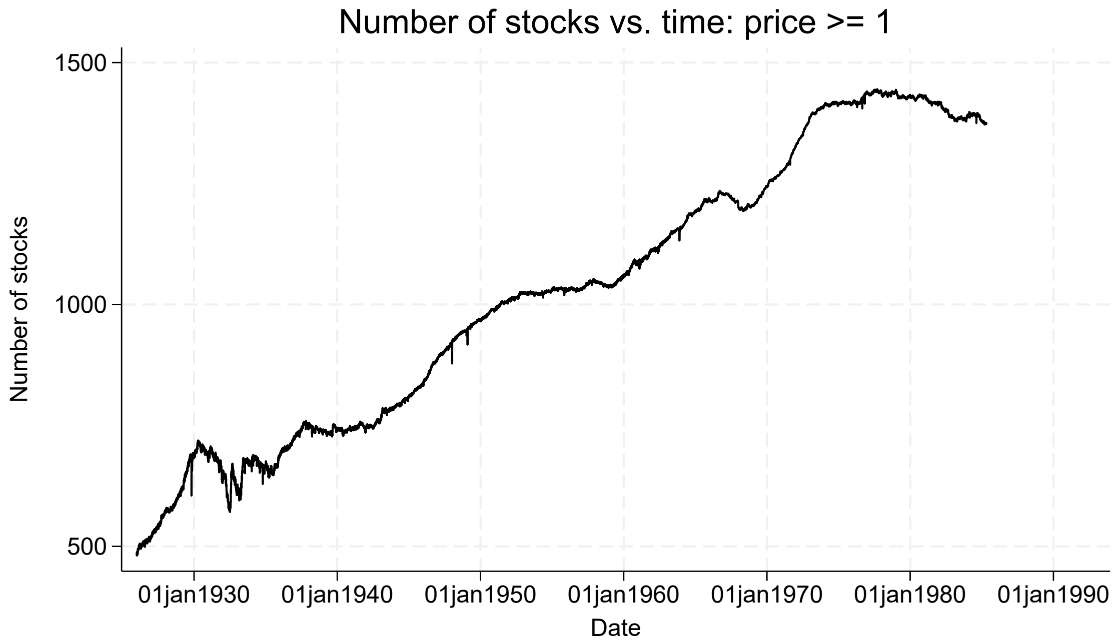


Figure A.5: **Number of Stocks over Time.** This figure plots the number of stocks in the sample over time. The horizontal axis reports calendar time, and the vertical axis reports the number of stocks with a price greater than or equal to $1 on each date.

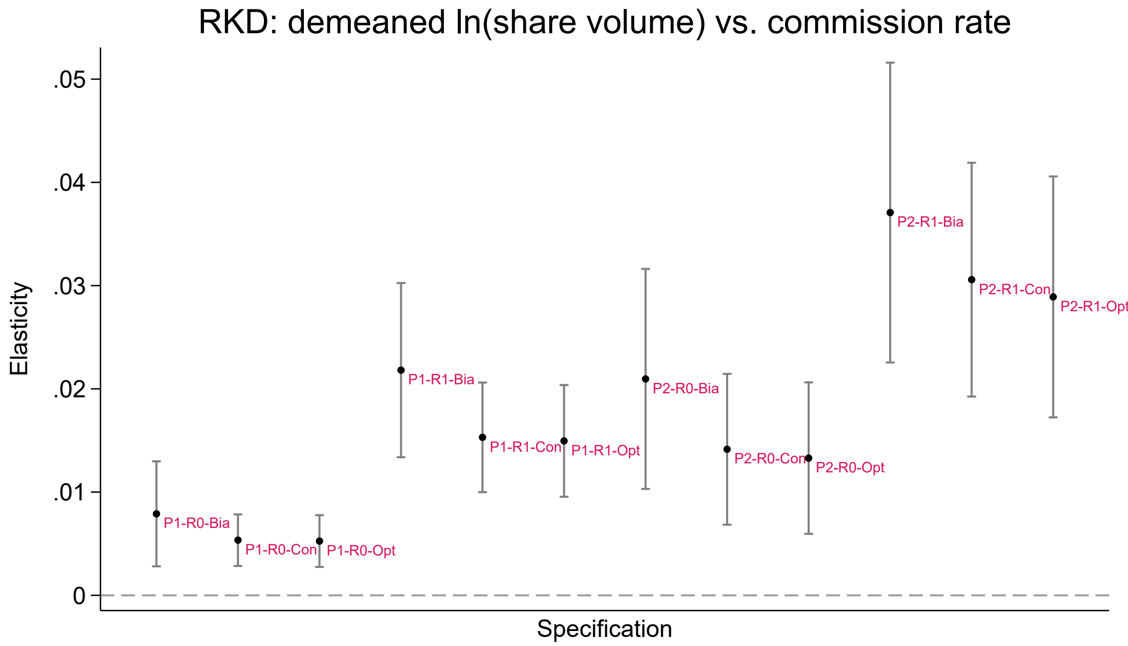


Figure A.6: **Regression Kink Design (RKD): Elasticity of Demeaned Log Share Volume with Respect to Commission Rate.** This figure reports the estimation results of Equation 2 - the elasticity of demeaned $ln(share\ volume)$ with respect to commission rate. The $ln(share\ volume)$ is demeaned within each of the commission regimes. Each dot and its correspondent confidence interval represents the estimation result of one model specification. We use mean squared error-optimal regression discontinuity (MSERD) bandwidth selector and triangular kernel function for all specifications, while varying polynomial orders, regularization choices, and bias correction choices across specifications. P1 refers to polynomial order 1, and P2 refers to polynomial order 2. R0 refers to opting out regularization, and R1 refers to opting in regularization. Bias refers to bias-corrected estimate and standard error (SE), Con refers to conventional estimate and SE without adjusting for bias, Opt refers to optimal choice of bias-correction regarding optimal mean squared error (based on tradeoff between bias and variance) for each estimation. For example, P1-R0-Bia – the far left specification – means the estimation uses polynomial order 1 function (linear) to fit data on both side of the cutoff, does not impose regularization for curved data around the cutoff, and does not adjust for bias. Each result of the specifications is a meta result of many RKD estimations of different kinks for which it weights different kink estimations by their inverse variance.

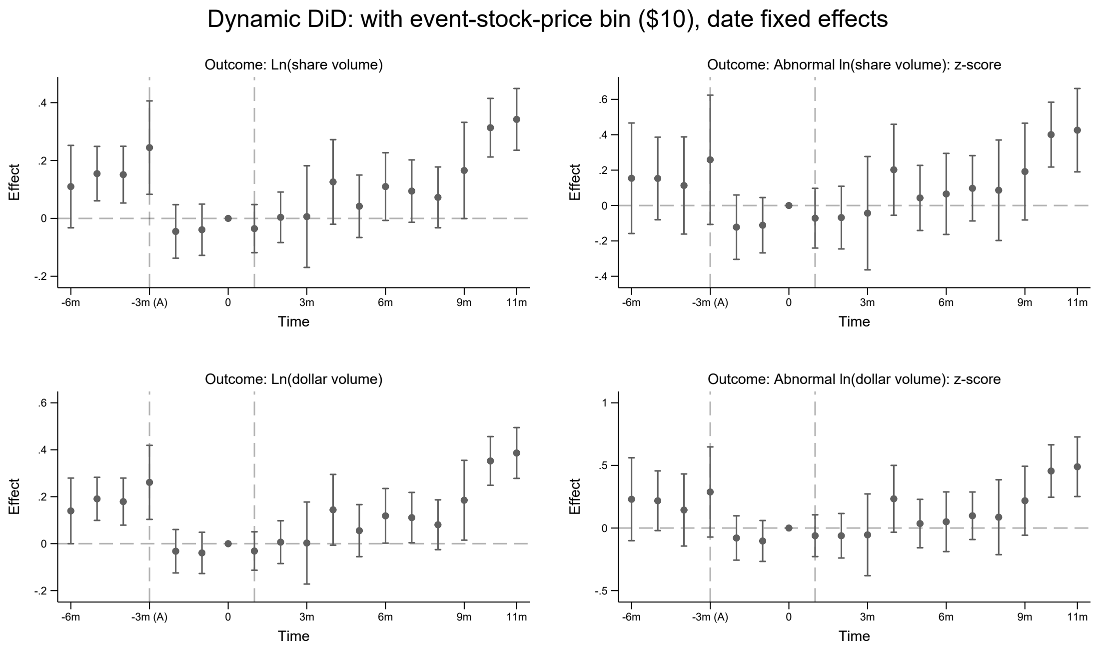


Figure A.7: **Difference in Differences Dynamics: Specification 2.** This figure reports the regression results of Equation (??) - the dynamics of the implementation effect of the commission reforms on trading volumes. There are four panels. The top left panel uses $ln(share\ volume)$ as the dependent variable. The top right panel uses abnormal $ln(share\ volume)$ as the dependent variable. The bottom left panel uses $ln(dollar\ volume)$ as the dependent variable. The bottom right panel uses abnormal $ln(dollar\ volume)$ as the dependent variable. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 7 months before to 10 months after each commission reform. Confidence interval is reported at significance level of 5%.

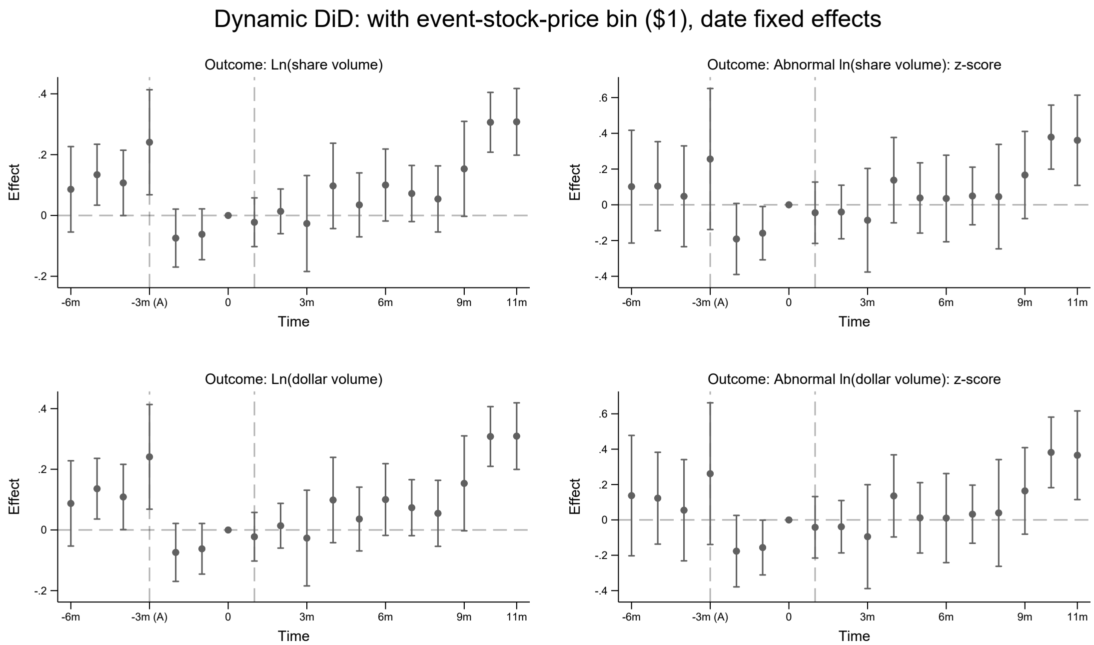


Figure A.8: **Difference in Differences Dynamics: Specification 3.** This figure reports the regression results of Equation (??) - the dynamics of the implementation effect of the commission reforms on trading volumes. There are four panels. The top left panel uses $ln(share\ volume)$ as the dependent variable. The top right panel uses abnormal $ln(share\ volume)$ as the dependent variable. The bottom left panel uses $ln(dollar\ volume)$ as the dependent variable. The bottom right panel uses abnormal $ln(dollar\ volume)$ as the dependent variable. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 7 months before to 10 months after each commission reform. Confidence interval is reported at significance level of 5%.

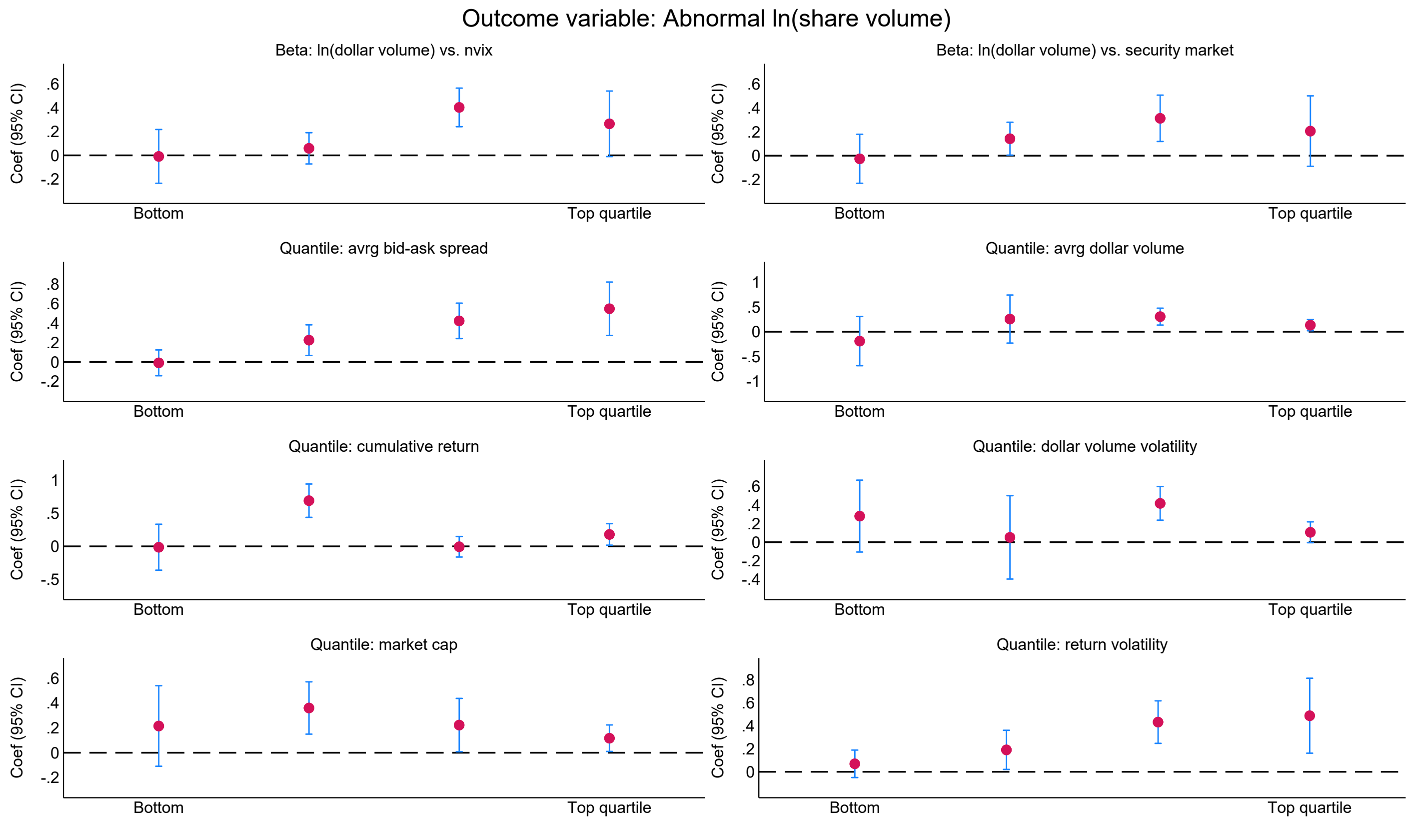


Figure A.9: **Difference in Differences: Heterogeneity in Stock Characteristics: Specification 2.** This figure reports the regression results of Equation (??) - the implementation effect of the commission reforms on abnormal $ln(share\ volume)$ across stock characteristics. We explored the heterogeneity in eight stock characteristics. The top left panel uses stock's exposure to news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX$. The top right panel uses stock's exposure to the security market component of the news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX : security\ market$. The third panel uses average bid-ask spread. The fourth panel uses dollar volume. The fifth panel uses cumulative return. The sixth panel uses dollar volume volatility. The bottom left panel uses market capitalization of the shares outstanding. The bottom right panel uses return volatility. For stock's exposure to NVIX, we use data three years prior to the commission change. And for the rest of the characteristics, we use data one year prior to the commission change. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 3 months before to 11 months after each commission reform. Confidence interval is reported at significance level of 5%.

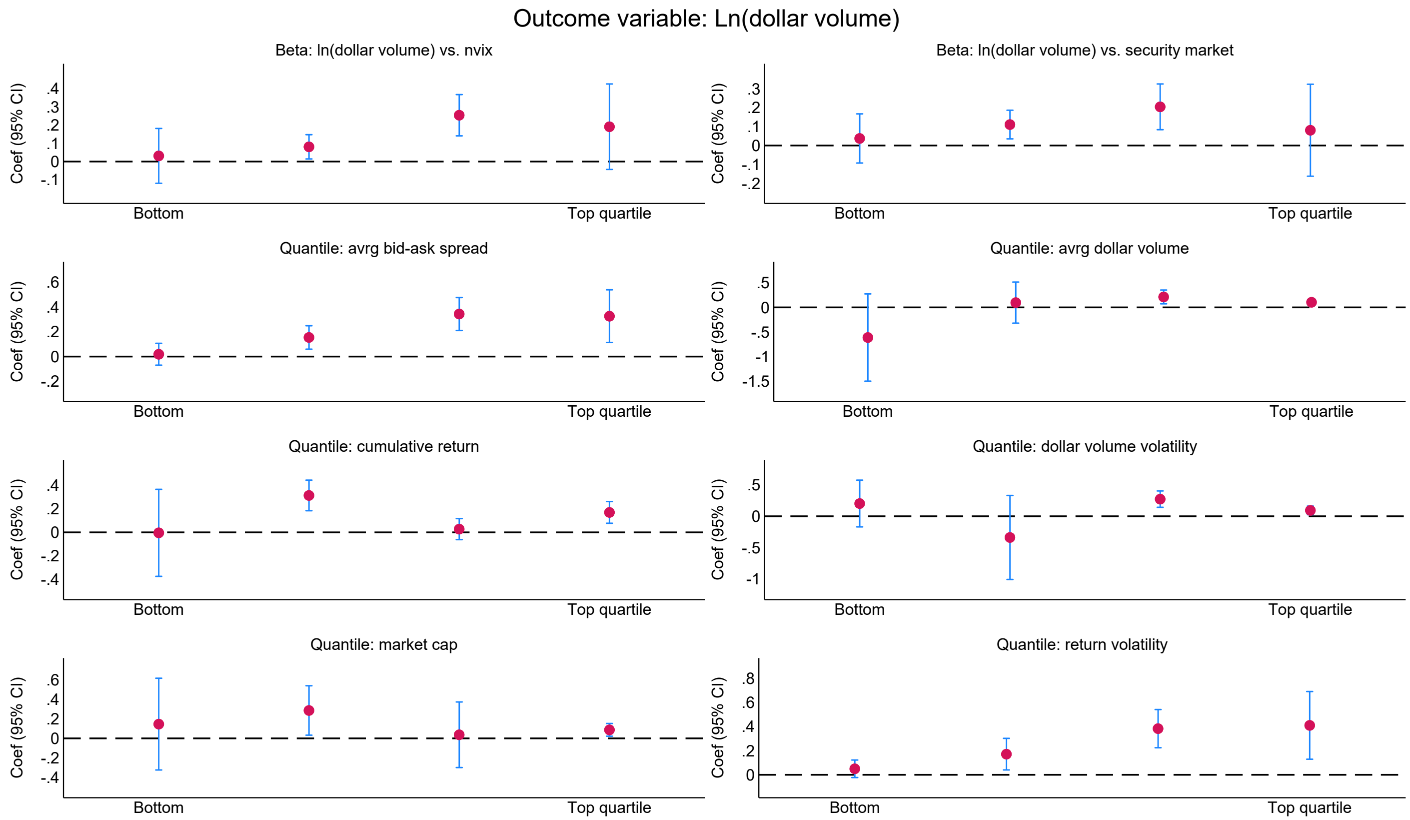


Figure A.10: **Difference in Differences: Heterogeneity in Stock Characteristics: Specification 3.** This figure reports the regression results of Equation (??) - the implementation effect of the commission reforms on $ln(dollar\ volume)$ across stock characteristics. We explored the heterogeneity in eight stock characteristics. The top left panel uses stock's exposure to news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX$. The top right panel uses stock's exposure to the security market component of the news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX : security\ market$. The third panel uses average bid-ask spread. The fourth panel uses dollar volume. The fifth panel uses cumulative return. The sixth panel uses dollar volume volatility. The bottom left panel uses market capitalization of the shares outstanding. The bottom right panel uses return volatility. For stock's exposure to NVIX, we use data three years prior to the commission change. And for the rest of the characteristics, we use data one year prior to the commission change. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 3 months before to 11 months after each commission reform. Confidence interval is reported at significance level of 5%.

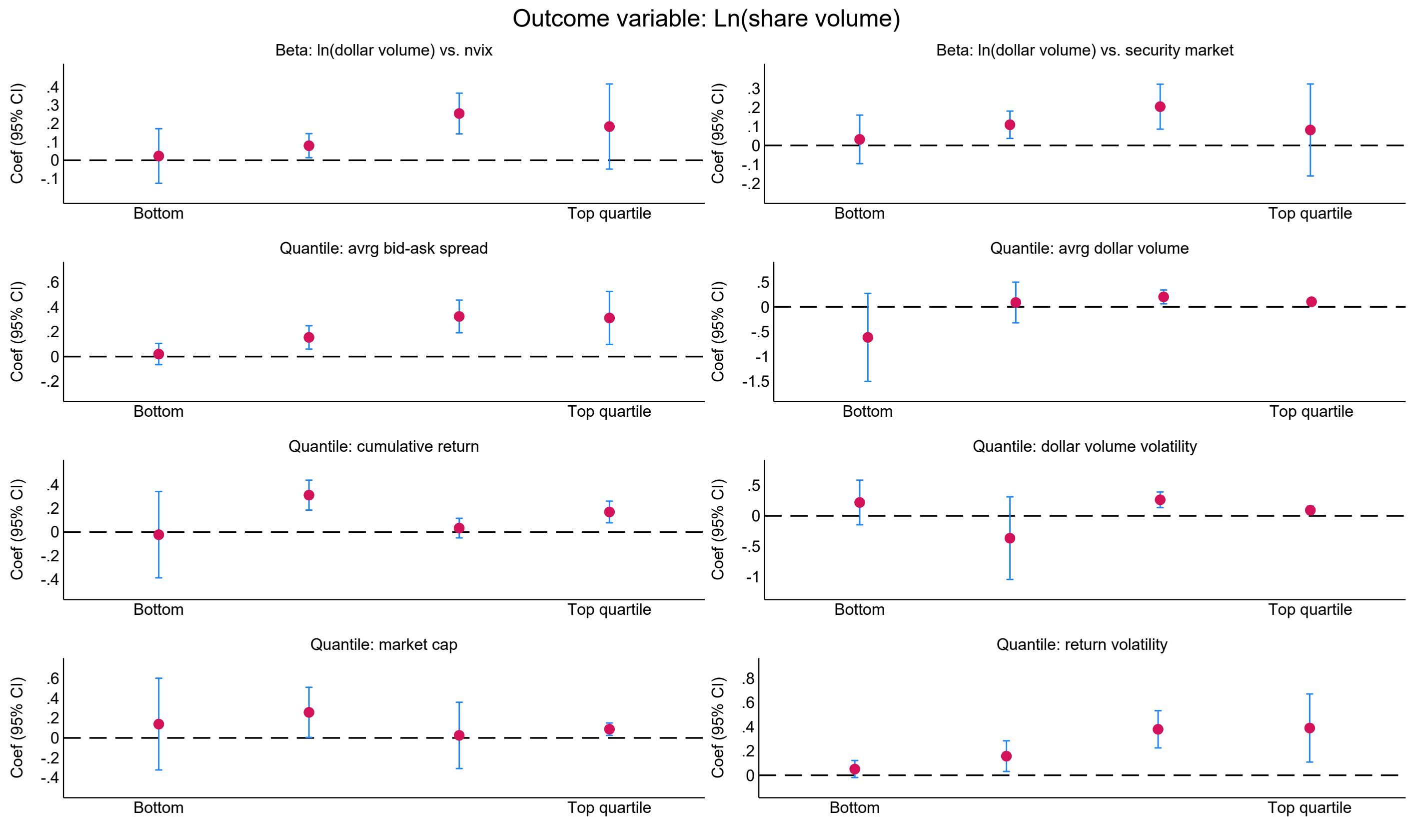


Figure A.11: **Difference in Differences: Heterogeneity in Stock Characteristics: Specification 4.** This figure reports the regression results of Equation (??) - the implementation effect of the commission reforms on $ln(share\ volume)$ across stock characteristics. We explored the heterogeneity in eight stock characteristics. The top left panel uses stock's exposure to news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX$. The top right panel uses stock's exposure to the security market component of the news-implied volatility index (NVIX), which is the estimated β by regressing $ln(dollar\ volume)$ on $NVIX : security\ market$. The third panel uses average bid-ask spread. The fourth panel uses dollar volume. The fifth panel uses cumulative return. The sixth panel uses dollar volume volatility. The bottom left panel uses market capitalization of the shares outstanding. The bottom right panel uses return volatility. For stock's exposure to NVIX, we use data three years prior to the commission change. And for the rest of the characteristics, we use data one year prior to the commission change. The abnormal volumes are z-scores, and are standardized based on the stock's one-year mean and one-year standard deviation before the each commission reform. The sample period range is 3 months before to 11 months after each commission reform. Confidence interval is reported at significance level of 5%.

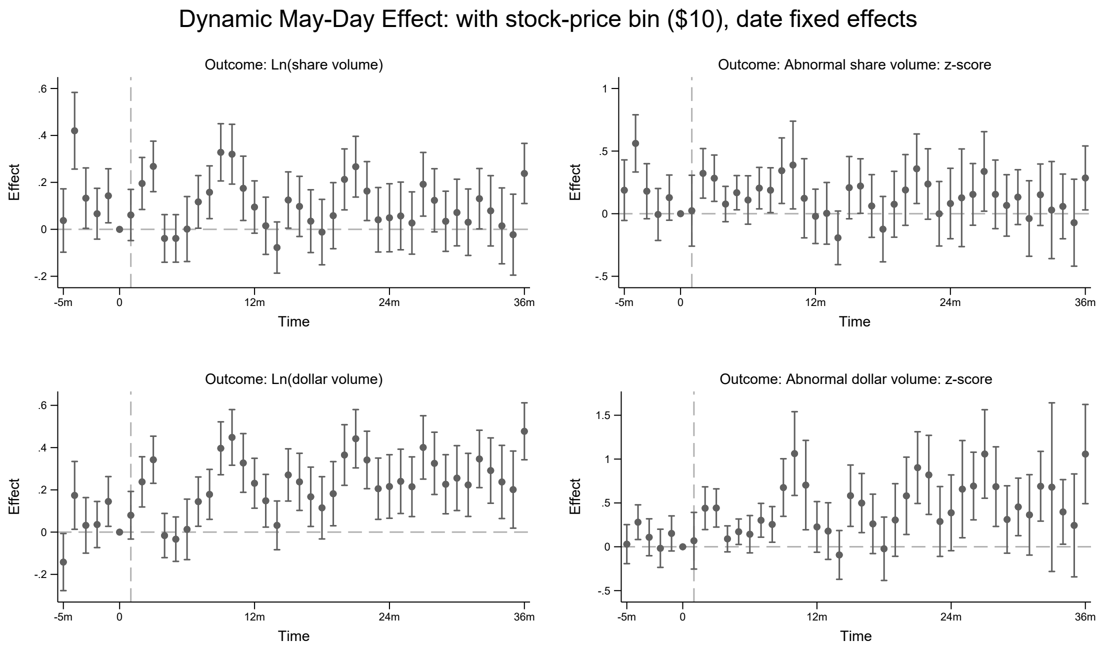


Figure A.12: **Impact of May Day on Trading Volume: Specification 2.** This figure reports dynamic difference-in-differences estimates of the impact of the May Day deregulation on trading volume. The horizontal axis reports event time in months relative to May Day, with month 0 indicating the baseline. The vertical axis reports the estimated treatment effect. All specifications include stock fixed effects, price-bin fixed effects at the $10 level, and date fixed effects. There are four panels. The top left panel uses ln(share volume) as the dependent variable. The top right panel uses abnormal share volume, defined as a z-score standardized by the stockâs one-year mean and one-year standard deviation prior to May Day. The bottom left panel uses ln(dollar volume) as the dependent variable. The bottom right panel uses abnormal ln(dollar volume), constructed analogously. Error bars report 95% confidence intervals.

Dynamic May-Day Effect: with stock-price bin ($1), date fixed effects

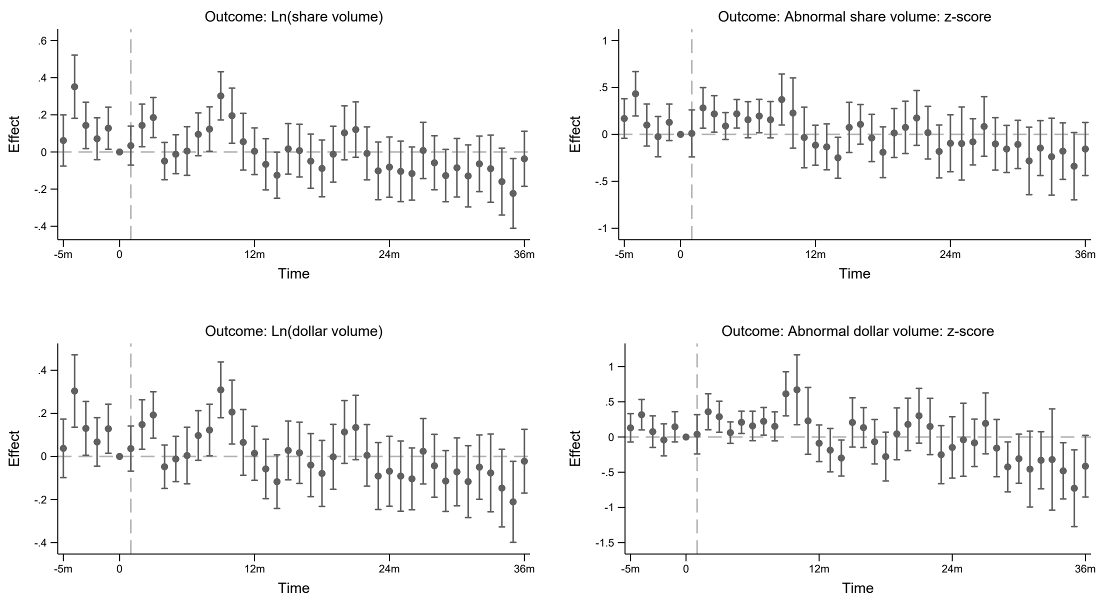


Figure A.13: **Impact of May Day on Trading Volume: Specification 3.** This figure reports dynamic difference-in-differences estimates of the impact of the May Day deregulation on trading volume. The horizontal axis reports event time in months relative to May Day, with month 0 indicating the baseline. The vertical axis reports the estimated treatment effect. All specifications include stock fixed effects, price-bin fixed effects at the $10 level, and date fixed effects. There are four panels. The top left panel uses ln(share volume) as the dependent variable. The top right panel uses abnormal share volume, defined as a z-score standardized by the stockâs one-year mean and one-year standard deviation prior to May Day. The bottom left panel uses ln(dollar volume) as the dependent variable. The bottom right panel uses abnormal ln(dollar volume), constructed analogously. Error bars reports 95% confidence interval.

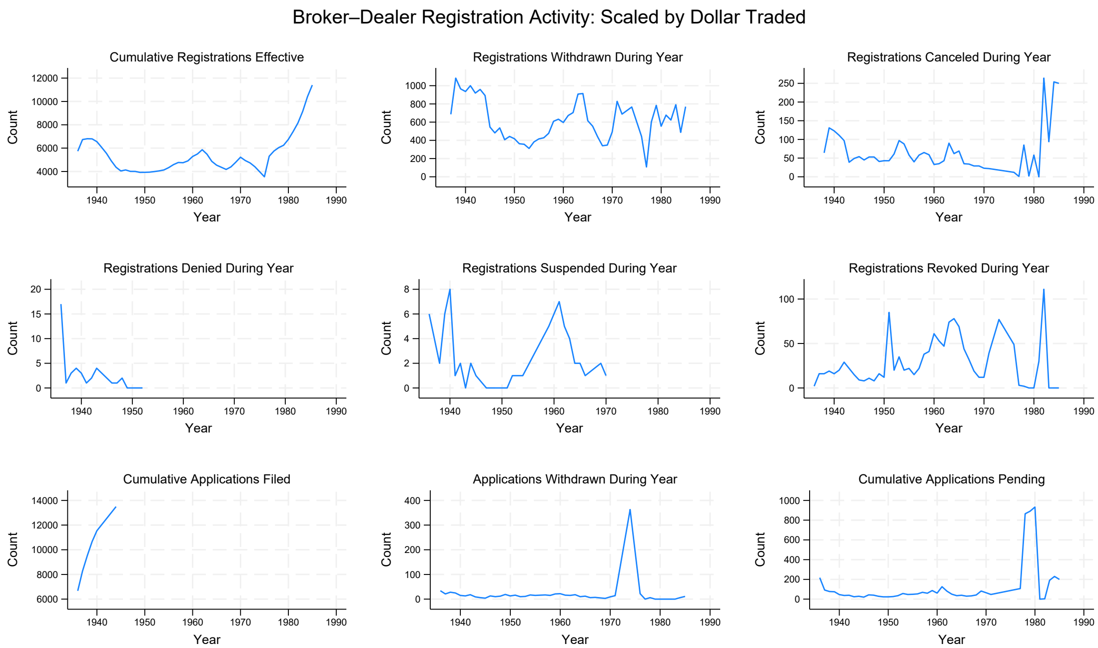


Figure A.14: **Broker-Dealer Registration.** This figure plots measures of broker-dealer registration activity over time. Each panel reports a different component of registration dynamics, including cumulative effective registrations, registrations withdrawn, canceled, denied, suspended, and revoked during the year, as well as cumulative applications filed, applications withdrawn during the year, and cumulative applications pending. The horizontal axis reports calendar year, and the vertical axis reports counts of registrations or applications. All series are scaled by aggregate dollar volume traded to account for changes in overall market activity over time.

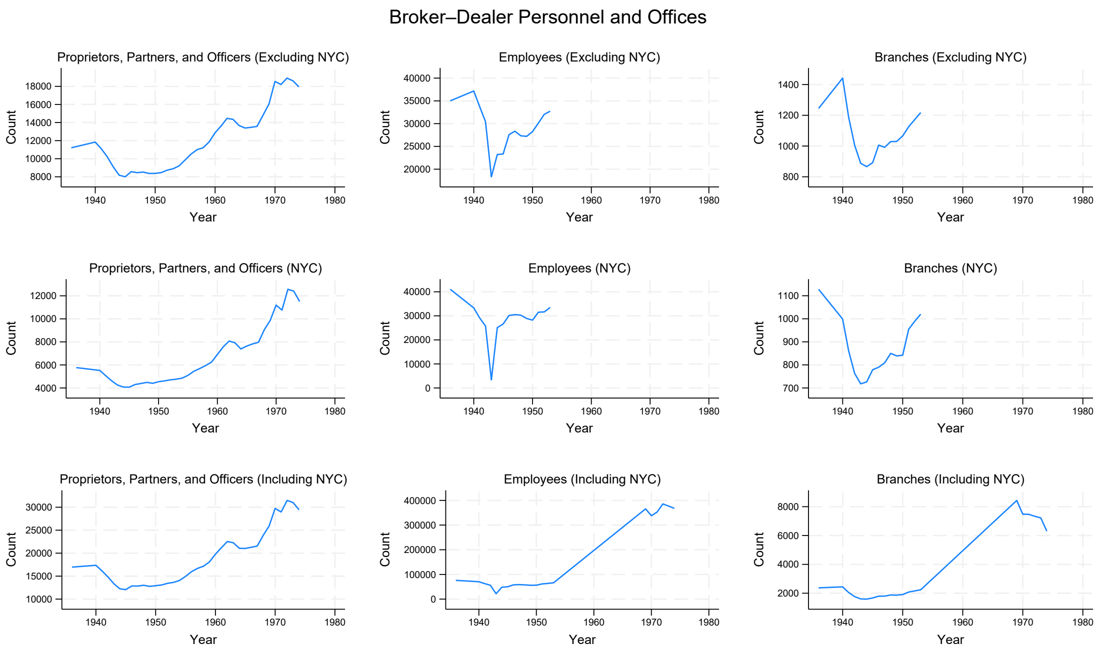


Figure A.15: **Broker-Dealer Personnel and Office.** This figure plots measures of broker-dealer personnel and office presence over time. Panels report counts of proprietors, partners, and officers; employees; and branch offices. Measures are shown separately excluding New York City (NYC), for NYC only, and including NYC. The horizontal axis reports calendar year, and the vertical axis reports counts.

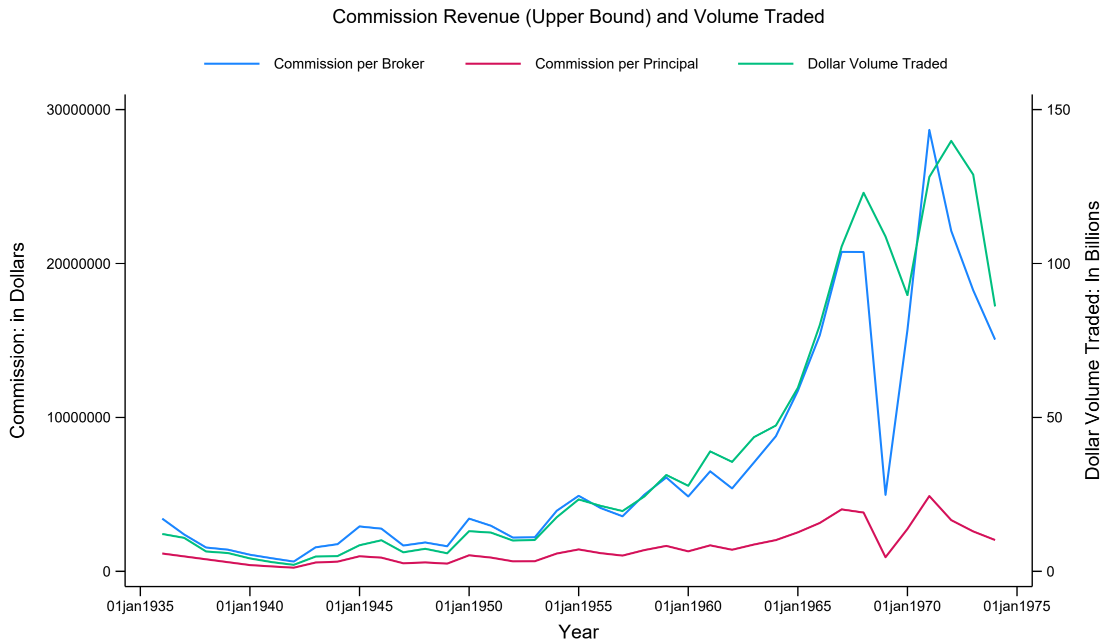


Figure A.16: **Commssion per Broker and Dollar Volume Traded: Upper Bound.** This figure plots the evolution of the theoretical upper bound of broker-dealer commission revenue and aggregate dollar trading volume over time. Commission per broker summarizes commission revenue per broker company over time. Commission per principal summarizes commission revenue per principal over time. Dollar volume traded summarizes the aggregate dollar volume trade over time. The left vertical axis reports commission assuming the total trades are divided into orders of 1 share - therefore the theoretical upper bound of commission revenue, while the right vertical axis reports aggregate dollar volume traded, measured in billions of dollars. The horizontal axis reports calendar time.