U.S. Chamber of Commerce

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April 1, 2022

Ms. Vanessa Countryman
Secretary
U.S. Securities and Exchange Commission
100 F Street NE
Washington, DC 20549

Re: Share Repurchase Disclosure Modernization (Release Nos. 34-93783, IC-34440; File No. S7-21-21)

Dear Ms. Countryman:

The U.S. Chamber of Commerce's ("the Chamber") Center for Capital Markets Competitiveness ("CCMC") writes regarding the Securities and Exchange Commission's ("SEC") February 15, 2022, proposed rule regarding disclosures about repurchases of an issuer's equity securities that are registered under Section 12 of the Securities Exchange Act of 1934 ("Proposed Rule" or "Proposal").[1] The Chamber appreciates the opportunity to comment on this consequential proposal.

The Chamber supports efforts by Congress and the SEC to ensure that America's capital markets maintain their status as the most competitive, transparent, and liquid in the world, which includes holding those who choose to engage in illegal behavior accountable. While the Chamber supports efforts to ensure that corporate insiders cannot game the system or bend the rules in their own favor, we are concerned that the approach the SEC has proposed toward these ends rests on inconclusive evidence, creates unnecessary burdens, is ultimately impractical, and imposes costs on and risks to the economy that the SEC has not adequately considered.

The Chamber is also concerned that the SEC is increasingly allowing insufficient time for the public to comment on significant and substantive changes in regulation. The SEC provided a 45-day comment period on this updated – and increasingly burdensome – framework for share repurchase disclosures. That length of time is not conducive for developing meaningful analysis to be able to provide meaningful feedback. As we wrote in an unheeded request for extension of the comment period,[2] this truncated timeline does not allow for the collection and development of the kind

[1] Share Repurchase Disclosure Modernization, 87 Fed. Reg. 8443 (Feb. 15, 2022) (hereinafter, "Proposed Rule").
[2] *Available at* https://www.sec.gov/comments/s7-21-21/s72121-20117648-270467.pdf

of empirical data and analysis that the SEC is requesting, which is essential to the SEC performing an adequate cost-benefit analysis as required by law. In addition, given the Commission's robust and fast-moving agenda, we are becoming increasingly concerned about the extensive compliance changes that our member firms will have to make concurrently to implement the universe of new rules that are part of the Commission's agenda. It is critical that the SEC consider in any rulemaking the impacts of new rules and other proposed rules under consideration. Specific to this Proposal, it is imperative that the SEC consider the implications or interrelatedness of its recently-proposed Rule 10b5-1 and Insider Trading release.[3]

As the SEC weighs whether and how to move forward with the Proposal, we encourage the Commission to consider the following:

1. **The Proposal fails to adequately explain whether and how the new requirements will promote efficiency, competition, and capital formation.**
2. **The Proposal does not adequately consider the next-day reporting requirement's costs, including additional market volatility, and it does not adequately weigh those costs against the Proposal's purported benefits.**
3. **The periodic "objective or rationale" disclosure will not promote efficiency, competition, or capital formation.**
4. **The Proposal's economic baseline analysis does not sufficiently consider that share repurchase programs create substantial benefits for market participants and investors – including retail investors – and should not be unduly deterred.**
5. **The Commission should quantify the Proposal's costs, and if it relies on commenters' submissions for that quantification, it must give adequate time for further comment.**

The CCMC stands ready to provide additional feedback and analysis on these concerns on behalf of its members.

ANALYSIS

The Commission, in exercising its rulemaking authority, has the statutory obligation to "consider, in addition to the protection of investors, whether the action will promote efficiency, competition, and capital formation." 15 U.S.C. § 78c(f); *id.* §§ 78w(a)(2), 80a–2(c). The Commission also must "*apprise itself*—and hence the public and the Congress—of the economic consequences of a proposed regulation before it decides whether to adopt the measure." *Chamber of Com. of U.S. v. SEC*, 412 F.3d 133, 144

[3] Release Nos. 33-11013, 34-93782; File No. S7-20-21

(D.C. Cir. 2005) (emphasis added). Failure to do so "makes promulgation of the rule arbitrary and capricious and not in accordance with law." *Bus. Roundtable v. SEC*, 647 F.3d 1144, 1148 (D.C. Cir. 2011); *see also Am. Equity Inv. Life Ins. Co. v. SEC*, 613 F.3d 166, 177 (D.C. Cir. 2010).

1. **The Proposal fails to identify a market failure that justifies the increased need for regulation as conceived.**

Under current rules, issuers are required to periodically disclose aggregated information about share purchases on a quarterly basis in Form 10-Q and annually in Form 10-K. This information includes the monthly number of shares purchased, the average price paid per share, the total number of shares purchased as part of a publicly announced share repurchase plan, the number of shares that may still be purchased under repurchase plans, and several related footnote disclosures describing, for example, the principal terms of publicly announced share repurchase programs. Current rules also require footnote disclosure of the principal terms of all publicly announced repurchase plans or programs, the number of shares purchased other than through a publicly announced plan or program, and the nature of the transaction.

The Commission's Proposal as conceived would principally require next day reporting of the number and average price of share repurchased on new Form SR. Additional requirements include a description of the repurchase program's rationale, the criteria used to determine how many shares it purchased, policies related to the trading activities of corporate insiders, and whether insiders traded in the ten-day period preceding the repurchase of shares. As an addendum to the Chamber's Fall 2021[4] white paper finds, the Commission's rationale for these additions makes several observations about the benefits associated with the proposed amendments, but does not explicitly articulate whether these new requirements will promote efficiency, competition, and capital formation. The Commission's economic analysis cites two economic considerations as justifications for the rule: (1) asymmetric information between insiders and external stakeholders; and (2) the opportunistic use of share repurchases by management. An independent analysis of these economic

[4] *See* Lewis, C., White, J. Corporate Liquidity Provision and Share Repurchase Programs. October 2021. Attached. *Also available at* https://www.centerforcapitalmarkets.com/wp-content/uploads/2021/09/CCMC_Stock-Buybacks_WhitePaper_10.2.21.pdf

considerations commissioned by the Chamber[5] finds these justifications do not sufficiently support the rule as proposed.

1.A The Proposal touts increased transparency but does not explain how increased transparency will promote efficiency, competition, and capital formation.

While some degree of information asymmetry may exist between issuers and investors, the SEC's economic analysis does not demonstrate that more frequent disclosure will have a large enough effect on capital costs or liquidity to outweigh any direct or indirect costs of additional disclosure burdens. Reducing asymmetric information will promote efficiency, competition, and capital formation only if the Commission establishes that insiders act in their own self-interest to produce an outcome that is economically harmful to other stakeholders but fails to do so. To the extent that an asymmetry exists, the Proposal fails to explain how reducing the asymmetry will, in aggregate, promote efficiency, competition, and capital formation.

The Commission points to three studies (Easley and O'Hara, 2004; Botosan, 2006, and Lambert, Luez, and Verrecchia, 2007) related to information asymmetries, but those studies do not address the question of whether the links they find to reductions in asymmetric information are associated with more frequent and timely repurchase disclosure. The SEC could have conducted myriad alternative analyses to address the purported necessity of more frequent disclosure of share repurchase activity that would have shown that the proposed disclosure may not result in better information for market participants.[6]

The Commission's analysis on information asymmetries also fails to consider whether daily disclosure could result in such frequent repurchase filings that it essentially creates "noise" in the disclosure regime. Indeed, prior academic work notes that "too much disclosure can be as costly as too little disclosure."[7]

Furthermore, the Commission's analysis also does not sufficiently explain its apparent reversal of the prior position that the appropriate way to promote efficiency, competition, and capital formation is to "minimize the market impact of the issuer's repurchases, thereby allowing the market to establish a security's price based on

[5] *See* Lewis, C., White. J. (March 2022). Addendum to U.S. Chamber of Commerce Fall 2021 white paper on share repurchases. *Attached and available at* https://www.centerforcapitalmarkets.com/resource/addendum_stockbuy-back/.

[6] *Id,* p. 2

[7] *See* Core, J. E. (2001). A review of the empirical disclosure literature: discussion. *Journal of Accounting and Economics*, 31(1-3), 441-456.

independent market forces without undue influence by the issuer." *Purchases of Certain Equity Securities by the Issuer and Others*, 68 Fed. Reg. 64,952, 64,953 (Nov. 17, 2003). Indeed, the Proposal's "transparency" rationale appears to directly conflict with the Commission's prior position that efficiency, competition, and capital formation are best served by "minimizing" the impact of repurchases—not highlighting them in daily disclosures. The Proposal does not adequately explain this reversal in position.

Finally, the Commission's analysis of market transparency does not sufficiently consider whether "under the existing regime, sufficient protections existed to enable investors to make informed investment decisions and sellers to make suitable recommendations to investors." *Am. Equity Inv. Life Ins. Co.*, 613 F.3d at 179. The current disclosure regime, including repurchase announcements, already provides significant transparency regarding repurchases. Too much transparency can reach the point of diminishing—or even negative—returns. In analyzing the Proposal's costs and benefits regarding transparency, then, the Commission must compare the new requirements to the existing regime, not to a regime in which transparency is altogether absent.

1.B The Proposal fails to support claims of opportunistic or manipulative use of share repurchases by insiders and does not consider empirical evidence refuting the notion that repurchases necessarily harm investment and employees.

The Proposal aims to reduce opportunistic use of repurchases based on a conjecture that managers might opportunistically use repurchases to manage earnings, inflate the stock price, or hit earnings per share ("EPS") targets to boost the realized value of their compensation. The Commission relies heavily on a June 2018 speech and empirical research presented by then-Commissioner Robert Jackson Jr. as justification for the Proposal. The Commission's "heav[y]" reliance on this single "relatively unpersuasive stud[y]" shows that the Proposal is based on "insufficient empirical data," and therefore unlawful. *Bus. Roundtable*, 647 F.3d at 1151.

During the speech, Commissioner Jackson introduced a new data analysis on how executives potentially use repurchases to "cash out" by selling their shares after the buyback announcement. Commissioner Jackson and his staff analyzed 385 issuers that announced repurchases over 2017 and the first three months of 2018 and interpreted the data as evidence that after a company tells the market that the stock is undervalued, executives overwhelmingly decide to sell. A broader analysis of that data, however, offers a different conclusion: that a slight uptick in insider sales

following a buyback announcement is largely mechanically driven by issuers' blackout periods, where both insider sales and repurchases are prohibited ahead of key information releases.

Here again, an independent analysis shows that the Commission's justification is insufficient. When the dataset presented by Commissioner Jackson is analyzed in full, it suggests that the post-buyback announcement increases cited by Commissioner Jackson's study could actually be driven by large outliers. Commissioner Jackson's conclusion that executives' sales of stock increase fivefold following an announcement might be better explained by a few large insider sales, and the data do not reflect systematic evidence of widespread insider trading around buyback announcements. Indeed, once 11 outliers were removed, an analysis of the remaining 16,264 observations in the dataset show that the Commissioner's conclusion that executives personally capture the benefit of the short-term increase in stock price following a buyback announcement is based on data and analysis that significantly overestimates the extent of insider selling due to the bias created by a small number of outlier observations that represent 0.07% of the Commissioner's data sample and does not represent a fivefold increase in selling as the Commissioner found. Thus, independent analysis of this data posits that the slight uptick in insider sales following a buyback announcement is actually the result of pre-set plans to execute sales after company blackout periods rather than opportunistic selling.[8]

Indeed, the Commission's Staff Study agrees with this conclusion, stating that: "There are a number of reasons why insider sales may coincide with repurchase program announcements, making it difficult to ascertain the motivations underlying insider sales. For example, because repurchase program announcements often coincide with earnings announcements and companies often prohibit insiders from trading in the period leading up to earnings announcements, insider sales activity may be the result of pent-up demand."[9] By neglecting this alternative explanation, the Proposal fails to adequately explain how the new requirements will overall promote efficiency, competition, and capital formation.

The Commission's economic analysis also fails to consider a new study from Dittmann, Li, Obernberger, and Zheng (2022) in which the authors examine whether insiders use share buybacks to sell equity at inflated stock prices around a stock

[8] *Supra* note 5, p. 3

[9] SEC Staff Response to Congress: Negative Net Equity Issuance (Dec. 23, 2020), p. 11, *available at* https://www.sec.gov/files/negative-net-equity-issuance-dec-2020.pdf.

buyback.[10] The authors find that the timing of both buyback programs and insider sales is largely determined by the issuer's corporate calendar through blackout periods and earnings announcement dates – times when both repurchases and insider sales are restricted. The authors conclude that any positive correlation between share repurchases and insider selling is likely driven by blackout periods and not opportunistic insider trading around repurchases.

Similarly, the SEC did not consider a 2019 study from PWC and Professor Alex Edmans of the London Business School, commissioned by the UK government, which examined whether buybacks were used to inflate executive pay in the UK from 2007-2017.[11] The authors found that, over the 10 years studied, not a single FTSE 350 firm used share buybacks to meet an EPS target that it would have otherwise missed. The authors further found that executives with EPS targets did not undertake more repurchases than those without.

The PWC/Edmans study also examined whether buybacks are undertaken at the expense of company investments. The authors found no relationship between share buybacks and investment, inconsistent with concerns that executives were funding repurchases in lieu of investment projects.

The Commission cannot "completely discount[] studies that "reach[] the opposite result" of the Commission's own conclusions. *Bus. Roundtable*, 647 F.3d at 1151.

1.C. Evidence cited around repurchases to achieve EPS-linked bonuses, repurchases and investment, and repurchases to manipulate markets is incomplete and inconclusive.

The Chamber has additional concerns around the integrity of cited references that the Proposal cites, and it is also concerned by the Commission's failure to consider less costly alternatives for promoting efficiency, competition, and capital formation by reducing any problems related to sections on EPS-linked bonuses,[12] repurchases and investment,[13] and repurchases to manipulate markets.[14]

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[10] *See* Dittmann, I., Li, A. Y., Obernberger, S., & Zheng, J. (2022). The impact of the corporate calendar on the timing of share repurchases and equity grants (January 21, 2022). Available at SSRN: https://ssrn.com/abstract=4004098.
[11] *See* Edmans, A. (2019). Share Repurchases, Executive Pay and Investment. *Available at* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817978/share-repurchases-executive-pay-investment.pdf
[12] *Supra* note 5, p. 7
[13] *Supra* note 5, p.10
[14] *Supra* note 5, p. 12

For instance, as the attached addendum notes, the Proposal does not discuss the Commission's 2020 Staff Study, which concludes: "[M]ost of the money spent on repurchases over the past two years was at companies that either do not link managerial compensation to EPS-based performance targets or whose boards considered the impact of repurchases when determining whether EPS-based performance targets were met or in setting the targets, suggesting that other rationales motivated the repurchases."[15]

Relatedly, the Proposal does not reflect the reality that many companies' compensation plans adjust for any impact of share repurchases beyond what was in the board-approved plan to begin with. Moreover, compensation committees review all the impacts of EPS growth, including on share repurchases, and take that into account when exercising discretion over how much is ultimately paid to management.

In sum, the Proposal fails to identify how increased disclosures of share repurchases will promote efficiency, competition, and capital formation. Moreover, the Commission's own 2020 Staff Study provides quantification that would refute some of the economic concerns that the Proposal references. Taken together, the Proposal and accompanying economic analysis do not present robust evidence of harms to investors and the securities market attributable to the current disclosure requirements for share repurchases.

The Chamber supports efforts to root out illegal behavior in the market but encourages the Commission to better analyze available evidence and adjust accordingly as it weighs how to proceed on subsequent rulemaking.

2. **The proposal does not adequately consider the next-day reporting requirement's costs, including additional market volatility, and it does not adequately weigh those costs against the Proposal's purported benefits.**

The Chamber is deeply concerned about the Commission's proposed next-day reporting requirement for share repurchase activity. As referenced in the discussion of information asymmetry above (2.A), the SEC has not offered compelling evidence that a next-day reporting requirement would create the benefit the Proposal purports it would. Instead, next-day reporting risks greater market volatility and imposes unnecessary burdens, both substantial harms that have not been thoroughly contemplated.

[15] *Supra* note 9, p.45.

An effective disclosure regime provides investors with the material information they need to make objective decisions regarding the value of an investment but does not overwhelm them with peripheral information that can obscure what is material and distract from what matters about a company.[16] The competitiveness of the U.S. capital markets depends on getting the balance of information right, including the frequency with which that information is provided. As Justice Thurgood Marshall explained in *TSC Industries v. Northway*, providing investors with "an avalanche of trivial information … is hardly conducive to informed decisionmaking."[17] Just as the SEC has a responsibility to protect investors from receiving too little information, so too does the SEC have a responsibility to protect investors from too much information. The SEC's proposed rule inadequately explains how it believes this rule strikes the correct balance.

As part of a comprehensive management strategy, some companies engage in stock buyback activity 250 days a year. Under the Proposal as conceived, that would lead to an additional 250 yearly disclosures that have not been demonstrated to be readily actionable or useful to the average investor. Providing information about repurchases on a next-day cadence risks providing just such "an avalanche of trivial information" to investors, potentially resulting in confusion rather than protection.

Providing too much information to investors also risks misinterpretation and, ultimately, increased market volatility. A next-day reporting cadence is divorced from other business and commercial reporting rhythms and is likely to present distorted information to the market. On a next-day frequency, Form SR would provide information to market participants that could give investors the impression they can glean meaningful insights about a company's intended activities based on an increase or decrease in share repurchase volume or cessation of a buyback plan altogether. Investors may be led to inaccurate views about a company's outlook or intentions and could ultimately promote speculative trading based on next-day information. Although produced in aggregate numbers and in average price paid per share, the amount of granular historical record companies would ultimately produce would be voluminous and mineable and could lead to incorrect conclusions about company practices and methodology.

Therefore, to the extent the Commission requires more information about share repurchase activity, it should do so with a frequency no less than once a month and in

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[16] *See* Center for Capital Markets Competitiveness (2017). Essential Information: Modernizing Our Corporate Disclosure System. *Available at* http://www.centerforcapitalmarkets.com/wp-content/uploads/2013/08/U.S.-Chamber-Essential-Information_Materiality-Report-W_FINAL.pdf?x48633

[17] 426 U.S. 438, 448-49 (1976)

backward-looking, aggregate terms. A monthly cadence would provide more focused information, limiting the likelihood of misinterpretation while providing sufficient information to the market and its regulator about company activity.

Moving Form SR to a once-a-month frequency would also cut down on the internal compliance challenges of next-day reporting. Disclosure of any kind poses logistical and mechanical challenges for companies. Next-day disclosure would exacerbate these challenges such that the force of disclosure would likely alter some companies' share repurchase practices, threatening the benefits that repurchases present, including to retail investors focused on returns in the long-term, as discussed in Section 4 below.

In addition, the SEC should provide greater clarification around disclosure related to Accelerated Share Repurchase ("ASR") transactions. The Proposal should clarify that any reporting requirements applicable to ASR transactions should apply only to the initial purchase by a company and to any additional shares acquired by the company at final settlement of the transaction period.

Should the SEC move forward with Form SR, it should take these consequences of next-day reporting into account and should strongly consider moving to a once-a-month frequency, and should thoroughly explain any analysis, including the cost-benefit analysis, that justifies a daily disclosure requirement as opposed to a monthly or less frequent alternative.

3. The periodic "objective or rationale" disclosure requirement will not promote efficiency, competition, or capital formation.

The Chamber is also concerned about the SEC's proposed Item 703 periodic disclosure requirements and corresponding changes to Forms 20-F and N-CSR. The SEC has proposed to require companies to disclose the 'objective or rationale' for its share repurchases and the process or criteria used to determine the amount of repurchases. Disclosures such as these are worrisome because they border on interfering with company governance, planning, and decisionmaking and again risk misinterpretation.

Companies use *surplus* capital for repurchases. Using this capital in this manner gives companies an efficient means of attenuating the temptation to invest in negative net present value projects that sub-optimally grow the size of a company's assets. Prior to the SEC's safe harbor for share repurchases, there was considerable evidence that

some managers would use surplus cash for projects or acquisitions that increased the size of assets under their control, aiming to boost managerial prestige and compensation and thereby destroying firm value.[18] Repurchasing shares limits the resources under management control, thereby requiring firms to engage with capital market participants to fund new investment. Stock buybacks are a valuable management tool that allows companies to better manage value and make healthy decisions.

The benefits of stock buybacks are abundant and clear; moreover, as discussed below and in the attached addendum, there is little evidence to show that executives and management are opportunistically structuring share repurchase programs for personal gain. The SEC, however, has predicated its proposed amendments around Item 703 on this very principle. The SEC's own economic analysis in the Proposal admits that "The benefits of the information about the rationale for repurchases could be limited ... if investors are able to infer the purpose of repurchases from other public information."[19] Further, the economic analysis goes on to say: "The benefits of the information about the rationale for repurchases could be limited if such disclosure is boilerplate and provides relatively little specificity to investors."[20] Companies engage in buybacks for purposes of corporate efficiency and, upon an explicit authorization and approval for a share repurchase program, already publicly disclose their intent to move forward with a repurchase program, including information such as: timing; size; features designed to achieve a specified objective; and method of repurchase. Investors thus have significant information about a repurchase program and an understanding of the program's mechanics and purpose. Additional disclosure in this manner would be superfluous and is likely to be boilerplate, and therefore – by the Commission's analysis – of little to no use to investors.

The costs of a "rationale or objective" disclosure, on the other hand, are significant. Companies that choose to comply with this disclosure requirement using something other than boilerplate language will incur costs to ensure that the language is holistic, does not create unnecessary litigation risk, and otherwise in compliance with regulatory requirements. The Proposal does not adequately quantify, analyze, or weigh these costs. On the other hand, boilerplate is unlikely to provide any new information to investors, and it is therefore unlikely to create any market benefits. Additional "rationale or objective" disclosures are thus unlikely to promote efficiency, competition, or capital formation.

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[18] *See* Jensen, M. (1986). Agency costs of free cash flow. American Economic Review, 76, 323–329.
[19] At p. 49
[20] *Id.*

Beyond "rationale and objective" disclosures, the Chamber also has concerns about new requirements pertaining to shares sold by executives during buyback periods. As explained above, any positive correlation between share repurchases and insider selling is likely driven by blackout periods and not opportunistic insider trading around repurchases. Despite this fact, the Commission has moved toward requiring new disclosures for directors' and officers' trading activity happening concurrently with a share repurchase program – based upon the unjustified assumption that nefarious activity is occurring. Additional disclosure in this regard could well lead investors to confuse correlation for causation of inappropriate company behavior (where there is none). This would undermine efficiency, not promote it. CCMC supports efforts to root out bad behavior, but encourages the SEC to consider the likelihood that proposed transparency measures could mislead investors, especially because many company repurchase programs operate almost every trading day of the calendar year and are often in compliance with Rule 10b-18 and current 10b5-1(c) practices.

While it is imperative that bad behavior be identified and stopped, disclosures should be designed to provide meaningful protections to investors and not unduly mislead them. As a result, the Chamber encourages the SEC to reconsider its periodic disclosure proposals or at a minimum to explain how those proposals will promote efficiency, competition, or capital formation.

4. The Proposal's economic baseline analysis does not sufficiently consider that share repurchase programs create substantial benefits for market participants and investors – including retail investors – and should not be unduly deterred.

Shareholders rightly expect companies to act as prudent stewards of their capital. Specifically, to the extent that companies generate capital that they cannot reinvest consistent with their strategic objectives, share repurchase programs present an efficient way to manage value and make smart business decisions.

Share repurchases contribute to stronger capital markets. A Fall 2021 white paper published by the Chamber found that corporate share repurchase programs are an important management tool for companies that have significant benefits for capital markets, particularly retail investors.[21] The Chamber's report identified a few key areas of economic benefit for share repurchases, including many benefits for retail investors:

[21] *Supra* note 4

1. Greater liquidity: Share repurchase programs provide substantial market liquidity, which facilitates orderly trading and reduces transaction costs for investors, including retail investors;
2. Reduced volatility: Share repurchases significantly reduce realized and anticipated return volatility. Imposing limitations on repurchase activity would increase stock market volatility and force investors, including retail investors, to bear greater amounts of downside risk;
3. Benefit to retail investors: Share repurchases generate an economically large benefit for retail investors. Since 2004, buybacks have saved retail investors between $2.1 – 4.2 billion in transaction and price impact costs;

Managers strategically use share repurchase programs during periods of uncertainty. These effects help mitigate risks, allow institutional and retail investors alike to buy and sell shares without having a large price impact, and stabilize trading markets. Thus, repurchases help to reduce volatility, which presents a benefit to all shareholders, including retail investors, regardless of whether investors buy and sell shares in their own accounts or participate indirectly through investment in retirement accounts. Company shareholders view share repurchases as an important element of value creation.

These benefits, including an estimated $4.1 billion savings to retail investors, must not be overlooked as the SEC contemplates moving forward with a rulemaking. In her statement supporting the proposed rule, Commissioner Allison Herren Lee characterized increased disclosure around repurchases, including the next-day reporting requirement and periodic rationale requirement, as a method to increase transparency that would benefit companies making "smart and thoughtful" choices and that, alternatively, "if anticipated disclosure operates to dampen enthusiasm for buybacks, that may well arise from flaws in the strategy behind the practice at certain companies."[22] What this view does not acknowledge, however, is that increased disclosure also presents an increased compliance burden and thus increased costs for companies that choose to engage in share repurchase programs. Although the Commission's proposed approach may seek to deter bad actors from gaming repurchase activity, the increased costs imposed on both small and large companies will deter them from making "smart and thoughtful" choices, and to reconsider engaging repurchases. Thus, the additional costs imposed by the Proposal would ultimately deprive investors, markets, and the public of those important benefits of share repurchase programs.

[22] *Available at* https://www.sec.gov/news/statement/lee-statement-corporate-share-repurchase-proposal-121521

The Commission should consider the effects that these benefits have on efficiency, competition, and capital formation as part of the Proposal's baseline analysis. The Commission should also consider whether the proposal will suppress repurchases, thereby suppressing the benefits discussed above, and it should quantify that suppression as one of the Proposal's costs. In other words, the Commission must be circumspect that it is not unduly deterring buybacks for all public companies based on perceived flaws in the strategy of a few. Indeed, the Commission's own 2020 Staff Report covering share repurchases concludes that, "... on average, repurchases are viewed as having a positive effect on firm value."[23] In effect, the Commission's Proposal embraces a dramatic shift in viewpoint on repurchases, which would require a substantial shift in facts in the past two years sufficient to justify such a changed worldview.

5. **The Commission must quantify the Proposal's costs, and if it relies on commenters' submissions for that quantification, it must give adequate time for further comment.**

The Commission has the statutory obligation "*apprise itself* . . . of the economic consequences of a proposed regulation before it decides whether to adopt the measure." *Chamber of Com. Of U.S.*, 412 F.3d at 144 (emphasis added); *see Bus. Roundtable*, 647 F.3d at 1150. The Proposal states that many costs and other effects of the Proposal "cannot be quantified." 87 Fed. Reg. at 8,451. Yet, even if some of the Proposal's effects cannot be quantified, the Commission must try to quantify those costs and effects that are quantifiable. For example, even where the Commission cannot quantify market-wide costs, it must "estimate[] the cost to an individual [company]" when such estimate is possible. *Chamber of Com. of U.S.*, 412 F.3d at 144.

The Proposal also "encourage[s] commenters to provide data and information that would help quantify the benefits, costs, and the potential impacts of the proposed amendments on efficiency, competition, and capital formation." 87 Fed. Reg. at 8,451. Yet, the Proposal does not explain the dissonance between the Commission's position that some effects cannot be quantified and the invitation for commenters to quantify the Proposal's effects. If the Commission is to rely on commenters to help discharge the Commission's duty to quantify costs and other effects, the Commission must, at minimum, provide the public with an explanation of which costs effects it believes to be quantifiable in the first instance.

[23] *Supra* note 15, p 42

Likewise, if the Commission is to rely on the public to quantify the Proposal's costs and other effects, then the Commission must give the public sufficient time to comment on that quantification. As explained in the Chamber's prior letter, 45 days is not nearly enough. In other words, the Proposal relies on the public for quantification, yet it denies the public sufficient time to do so. These aspects of the Proposal reflect a strategy by which the Commission can attempt to avoid its duty to "apprise itself" of a regulation's costs. *Chamber of Com. Of U.S.*, 412 F.3d at 144. While the truncated comment period is concerning in and of itself, it is especially concerning given the Commission's invitation for the public to quantify costs—an assessment that is the Commission's own responsibility. To the extent that this strategy allows the Commission to avoid that duty, it embodies unlawful arbitrary and capricious rulemaking.

Conclusion

The Chamber appreciates the opportunity to weigh in on these important matters. Share repurchases provide important benefits to investors, companies, the capital markets, and the economy overall. Although the Chamber supports efforts to hold specific bad actors accountable through transparency, regulation must be constructed in a manner that is practical, does not deter positive market benefits, and is well-supported.

The Chamber and its members stand ready to assist the SEC toward these goals.

Sincerely,

Tom Quaadman
Executive Vice President
Center for Capital Markets Competitiveness
U.S. Chamber of Commerce

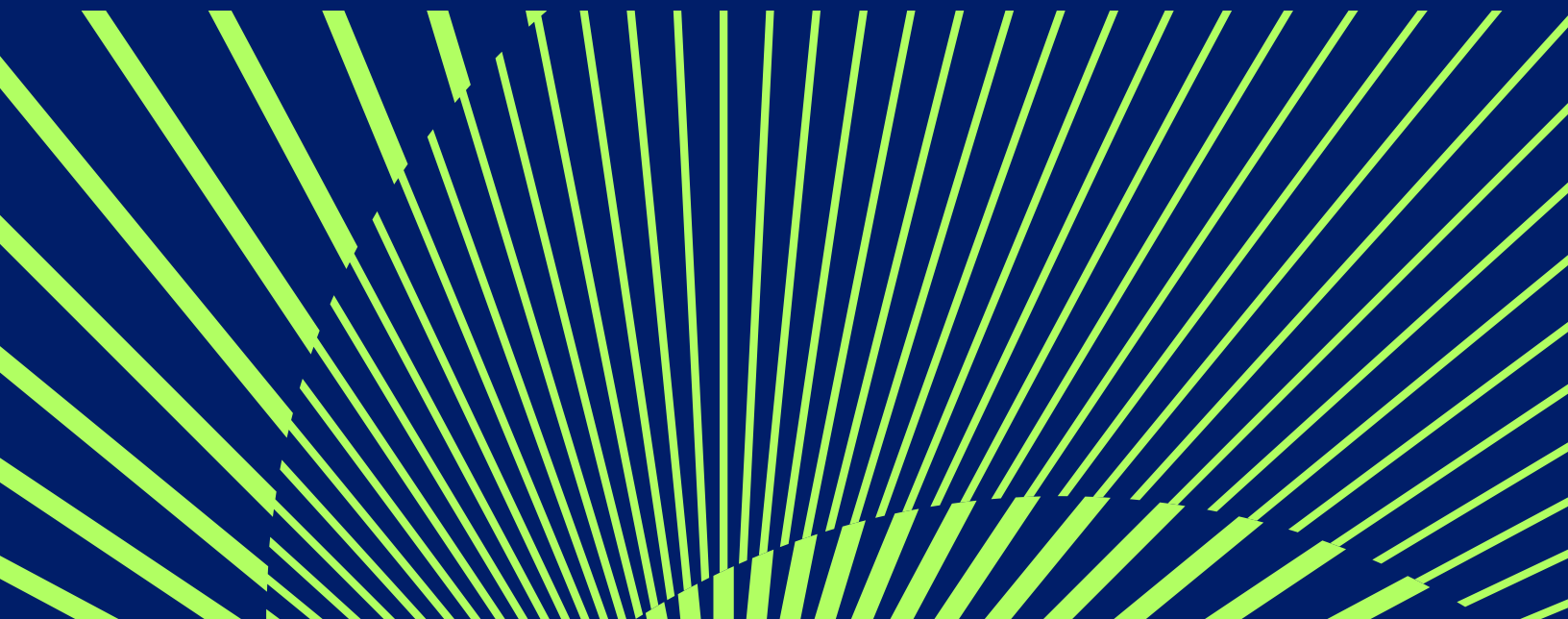
U.S. Chamber of Commerce
Center for Capital Markets
Competitiveness

Addendum

Corporate Liquidity Provision &

Share Repurchase Programs

By: Craig M. Lewis & Joshua T. White



Craig Lewis, Josh White

File No. S7-21-21; Share Repurchase Disclosure Modernization
March 22, 2022

On December 15, 2021, the U.S. Securities and Exchange Commission ("Commission") proposed amendments to its rules regarding the disclosure of share repurchase programs or, as they are colloquially known, stock buybacks. The amendments contained in the Share Repurchase Disclosure Modernization proposal rulemaking (hereafter referred to as the "Proposal") would require more frequent and detailed disclosures regarding issuers purchasing of their own stock.

Under the current rules, issuers are required to periodically disclose aggregated information about share purchases on a quarterly basis in Form 10-Q and annually in Form 10-K. This information includes the monthly number of shares purchased; the average price paid per share; the total number of shares purchased as part of a publicly announced share repurchase program; the number of shares that may still be purchased under share repurchase programs; and several related footnote disclosures describing, for example, the principal terms of publicly announced share repurchase programs. The current rules also require footnote disclosure of the principal terms of all publicly announced share repurchase programs, the number of shares purchased other than through a publicly announced program, and the nature of the transaction.

The Proposal would principally require next-day reporting of the number and average price of shares repurchased on new Form SR.[1] Additional requirements include a description of the share repurchase program's rationale, the criteria used to determine how many shares the company purchased, policies related to the trading of corporate insiders, and whether insiders traded in the 10-day period preceding the repurchase of shares.

We were commissioned by the United States Chamber of Commerce to assess the soundness of the economic analysis ("EA") that accompanies the Proposal. As we demonstrate below, the EA contains numerous flaws. Most notably, the EA does not articulate a market failure that justifies the need for potential rulemaking; instead, it makes several observations about anticipated benefits but does not explicitly discuss whether the Proposal solves an actual problem. Rather, the EA primarily relies on simple economic reasoning to qualitatively assess potential benefits, such as greater transparency, regardless of whether an actual problem that warrants rulemaking exists. The EA also makes numerous conjectures about opportunistic behavior by issuers and insiders that are primarily supported by a flawed empirical analysis conducted by former SEC Commissioner Robert Jackson.

The Proposal describes two primary economic considerations for potential rulemaking: (1) the opportunistic use of share repurchases by management and (2) asymmetric information between insiders and external stakeholders. We begin by examining the economic baseline of the EA, which is the de facto alternative regulatory approach. The baseline is an essential part of the EA as it represents a reference point

1. The proposed Form SR would require the following disclosure: (1) date of the repurchase; (2) identification of the class of securities purchased; (3) the total number of shares (or units) purchased, including all issuer repurchases regardless of whether they were made pursuant to publicly announced programs. It also requires the following additional disclosures: (1) the average price paid per share (or unit); (2) the aggregate total number of shares (or units) purchased on the open market; (3) the aggregate total number of shares (or units) purchased in reliance on the safe harbor in Exchange Act Rule 10b-18; and (4) the aggregate total number of shares (or units) purchased pursuant to a plan intended to satisfy the affirmative defense conditions of Exchange Act Rule 10b5- 1(c). See https://www.sec.gov/ rules/ proposed/2021/34-93783.pdf or the accompanying fact sheet at https://www.sec.gov/rules/proposed/2021/34-93783-fact-sheet.pdf.

when comparing alternative rulemaking actions.[2] We characterize how well the EA documents the existence of a market failure. We then identify instances where the EA fails to quantify aspects of the baseline as well as the incremental costs or benefits of Proposal, even though, in some cases, opportunities for quantification exist.

As part of our analysis, we review the relevant academic literature and assess whether the evidence supports the Commission's interpretation of these studies. We note instances where the EA incorrectly or incompletely cites empirical studies. Although some of these deficiencies can be corrected, we conclude that, on net, the EA reflects an incomplete assessment of the academic literature that appears to be designed to frame the economic effects in a manner that supports the Proposal rather than to objectively assess it.

Our overarching conclusion is that the EA fails to convincingly identify the existence of a market failure. As such, the Proposal lacks merit and could lead to unanticipated consequences that are detrimental to the interests of issuers and investors.

We structure our addendum as follows. Section I discusses possible opportunistic use of repurchases by issuers/insiders. Section II examines information asymmetries between investors and issuers/insiders around repurchases. Section III offers a brief conclusion. Appendix A tabulates the topical content of 80 studies cited in the Proposal. Appendix B tabulates 22 relevant studies that the EA does not reference.

I. Opportunistic Share Repurchases

The first potential market failure—the *opportunistic use of repurchases*—is based on a conjecture that managers might use repurchases to manage earnings, inflate stock prices, or hit earnings per share ("EPS") targets to boost the realized value of their compensation. The clearest explanation of this market failure occurs in the Proposal's introduction:[3]

> *"Some of these commentators view issuer share repurchases as a tool to raise the price of an issuer's stock in a way that allows insiders and senior executives to extract value from the issuer instead of using the funds to invest in the issuer and its employees."*

As we discuss below, claims of opportunistic or manipulative use of share repurchases by insiders are not supported by economic analysis. As the above quote illustrates, the EA ignores empirical evidence refuting the notion that repurchases necessarily harm investment and employees, choosing instead to reference opinions offered by commentators.

2. Prior academic work argues that the baseline sets a benchmark for estimating the costs and benefits of the proposed rule because policy choices will vary based on how the current landscape and market failure is framed. See White, J. T. (2015). The evolving role of economic analysis in SEC rulemaking. *Ga. L. Rev.*, 50, 293-325.
3. We note that certain economic effects are discussed in the Proposal's introduction but are missing from the EA. Because the EA fails to explicitly articulate a clear market failure, the reader is forced to interpret the discussion in the introduction as the Commission's description of the market failure.

A. Insider Selling Around Repurchases

The Proposal's introduction characterizes the evidence that indirectly motivates the possibility that managers opportunistically use buybacks to increase their realized compensation. Throughout the Proposal, the Commission relies heavily on a June 2018 speech by then SEC Commissioner Robert Jackson Jr. ("Jackson Speech").[4] During this speech, Commissioner Jackson introduces new data analysis (the "Jackson Dataset") that reputedly shows how executives use repurchases to "cash out" by selling their shares after the buyback announcement.

Commissioner Jackson and his staff analyzed 385 issuers that announced repurchases from January 2017 through March 2018. They conclude that "after the company tells the market that the stock is cheap, executives overwhelmingly decide to sell." As a confirmation of this activity, Commissioner Jackson presents the graph in Figure 1; it shows that the average total transaction value of insider shares sold increases by more than fivefold just after a repurchase is announced.

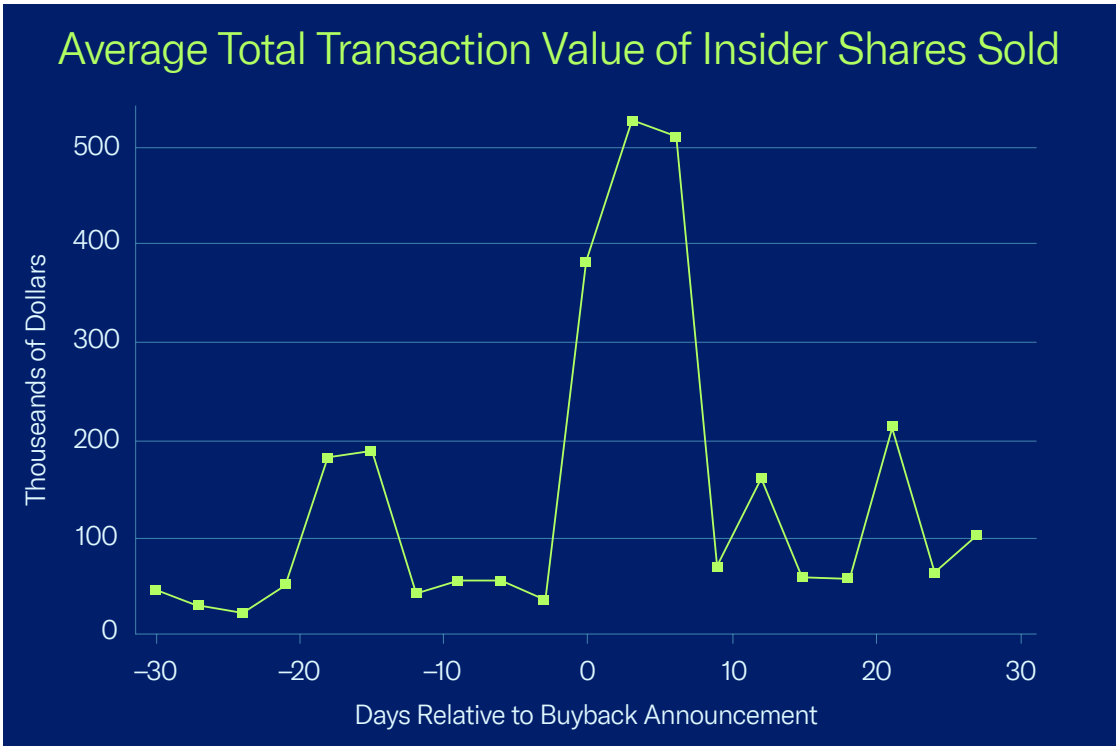


Figure 1. This figure presents the average total transaction value of insider shares sold around repurchase announcements. It is excerpted directly from then Commissioner Jackson's Speech and is reported as Figure A.3. in the data appendix to this speech.

4. See the speech by Commissioner Jackson Before the Center for American Progress: Jackson, Jr., R. J., (2018, June 11). *Stock buybacks and corporate cashouts*, https://www.sec.gov/news/speech/speech-jackson-061118 ("Jackson Speech"). The data appendix is found at https://www.sec.gov/files/speech-jackson-061118-data-appendix.pdf. The dataset underlying the speech is available at https://www.sec.gov/files/ combined_datasets.csv.

Commissioner Jackson interprets this graph as follows:

> *"On average, in the days before a buyback announcement, executives trade in relatively small amounts—less than $100,000 worth. But during the eight days following a buyback announcement, executives on average sell more than $500,000 worth of stock each day—a fivefold increase. Thus, executives personally capture the benefit of the short-term stock-price pop created by the buyback announcement."*

We download and analyze the Jackson Dataset. Figure 1 above plots the three-day moving average of the total transaction value of insider shares sold in the 61-calendar-day event window ([−30, +30]) that centers on the buyback announcement. Because a moving average smooths transaction activity, it tends to overstate the influence of outliers by making trading activity look more persistent than it actually is. To demonstrate this point, we plot the daily average for the Jackson Dataset in Figure 2.

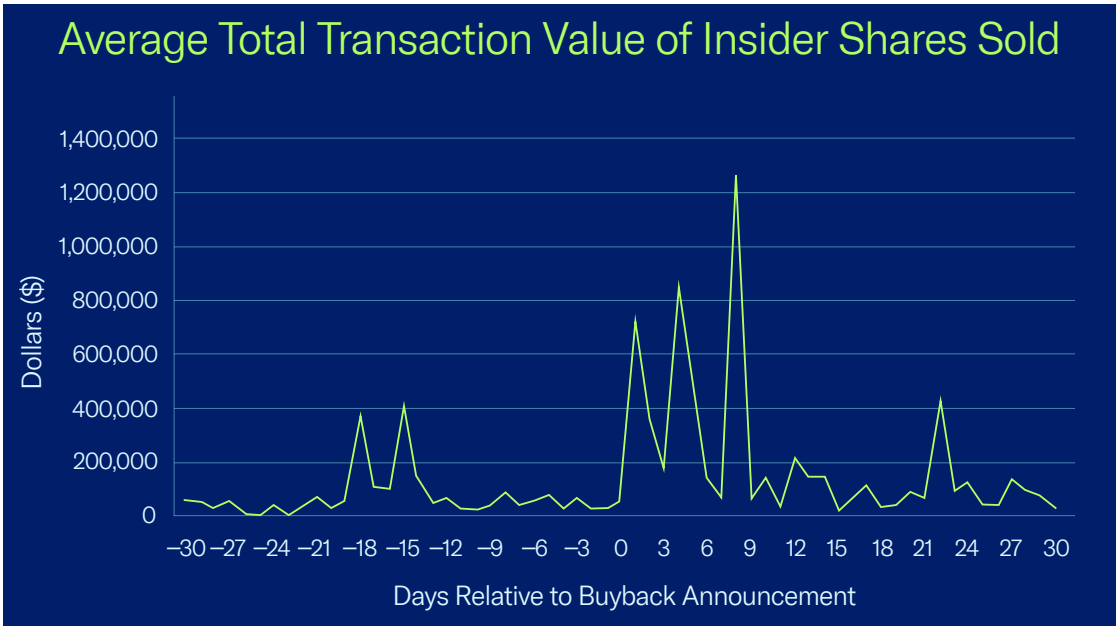


Figure 2. This figure reports average daily transaction value of insider shares sold using the Jackson Dataset.

The overall pattern in Figure 2 is similar to that of Figure 1; however, because our graph is not smoothed, it exhibits large oscillations—which raises the possibility that increases in post-buyback transaction activity could be driven by a small number of large insider sales rather than widespread insider trading around buyback announcements.

Indeed, in Table 1 below, we report that the average and median total transaction values of insider shares sold are $147,753 and $0 over the 61-day event window, respectively. The large size of the sample standard deviation ($3,975,982) relative to the average indicates that the Jackson Dataset exhibits significant right-skewness. For example, the 99th percentile is $2,062,200, while the maximum value is $382,737,472.

Table 1 also shows that we obtain similar results if we expand our analysis to a 121-day event window ([−60, +60]).

Event Window	Mean	Standard Deviation	P1	P25	P50	P75	P90	P99	Maximum
[−30, +30]	147,753	3,975,982	0	0	0	0	0	2,062,200	382,737,472
[−60, +60]	182,136	5,625,048	0	0	0	0	0	1,623,672	530,900,000

Table 1. This table presents the distribution statistics of the total transaction value ($) of insider shares sold using the Jackson Dataset.

Using the Jackson Dataset of 385 stock buybacks, 16,275 possible transaction days occurred during the [−30, +30] event window and 31,021 possible transaction days during the [−60, +60] event window. If we exclude observations that exceed the 99.9th percentile (i.e., all daily total transaction values of insider shares sold that exceed $21,264,840), we remove 11 observations: 3 observations from the [−30, −1] window and 8 from the [+1, +30] window. We then plot the average total transaction value of insider shares sold using the remaining 16,264 observations below in Figure 3.

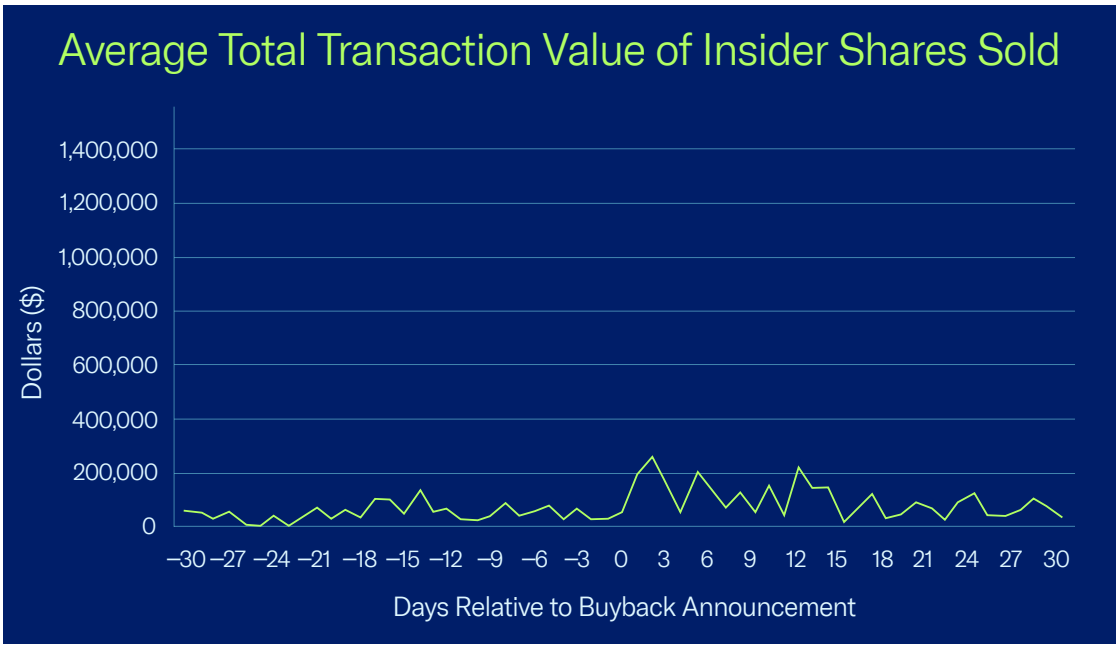


Figure 3. This figure reports average daily transaction value of insider shares sold using the Jackson Dataset after removing all observations that exceed the 99.9th percentile.

Figure 3 tells a different story than the one presented in the Jackson Speech. Specifically, Figure 3 illustrates how removal of a few outliers eliminates the large spikes in transaction activity observed in Figures 1 and 2. The difference relative to the prior figures is visually striking. Thus, Commissioner Jackson's conclusion—that "executives personally capture the benefit of the short-term stock-price pop

created by the buyback announcement"—is based on an analysis that significantly overestimates the extent of insider selling. We attribute this overestimation to bias created by a small number of outlier observations in the former Commissioner's sample. We conclude that one of the key analyses underlying the Proposal does not present robust evidence that insiders opportunistically sell, or "cash out," their shares after a buyback announcement.

Rather than attributing the increase in post-buyback announcement trading to opportunistic behavior, we posit that the uptick in insider sales is mechanically driven by issuer blackout periods, during which both insider sales and repurchases are prohibited ahead of key information releases. Despite the economic relevance of this alternative explanation, the EA briefly relegates the discussion of blackout periods to two footnotes. Footnote 58 of the EA references the 2020 SEC Staff Study:

> *"There are a number of reasons why insider sales may coincide with repurchase program announcements, making it difficult to ascertain the motivations underlying insider sales. For example, because repurchase program announcements often coincide with earnings announcements and companies often prohibit insiders from trading in the period leading up to earnings announcements, insider sales activity may be the result of pent-up demand."*

Footnote 81 of the EA notes that:

> *"In the case of repurchase announcements, where such announcements coincide with earnings announcements, because issuers generally prohibit insiders from trading in the period leading up to earnings announcements as part of blackout periods, insider sales activity after the repurchase announcement may be the result of pent-up liquidity demand."*

As the Commission considers a re-proposal or adopting a final release, the EA should cite a study by Dittmann, Li, Obernberger, and Zheng (2022) that became publicly available shortly after the Proposal.[5] In this study, the authors examine whether insiders use share repurchases to sell equity at inflated stock prices. They find that the timing of both buyback programs and insider sales is largely determined by trading prohibitions attributable to blackout periods and earnings announcement dates—times when both repurchases and insider sales are restricted. Thus, any positive correlation between share repurchases and insider selling is likely driven by blackout periods rather than opportunistic insider trading around repurchases.

After controlling for the "corporate calendar," Dittmann et al. (2022) present empirical evidence that the positive correlation between share repurchases and equity-based compensation disappears, and conclude that:[6]

5. See Dittmann, I., Li, A. Y., Obernberger, S., & Zheng, J. (2022, January 21). The impact of the corporate calendar on the timing of share repurchases and equity grants, available at https://ssrn.com/abstract=4004098.
6. Dittmann et al. (2022) control for the corporate calendar using fiscal-month fixed effects and the monthly share of blackout days.

"[W]e do not find systematic evidence of price manipulation when the CEO's equity vests or when the CEO sells her vested equity."

Dittmann et al. (2022) also show that a CEO is more likely to buy rather than sell stock when a new share repurchase program is announced. They summarize their findings as follows:

"Overall, these results suggest that the CEO tends to believe that the stock is undervalued when she initiates a buyback program. There is no evidence for the notion that the CEO uses buyback announcements to create short-term private benefits."

B. Repurchases to Achieve EPS-Linked Bonuses

The Proposal claims that insiders opportunistically use share repurchase programs to inflate the reported EPS by reducing the shares outstanding in the denominator. Unfortunately, the EA provides no independent quantification demonstrating the rate or magnitude of EPS-driven repurchase activity—something that should be included when characterizing the economic baseline. Instead, the EA only notes:

"Share price- or EPS-tied compensation arrangements can thus incentivize executives to undertake repurchases, in an attempt to maximize their compensation, even if such repurchases are not optimal from the shareholder value maximization perspective."

The associated discussion of this topic is largely relegated to Footnotes 78, 79, and 80, where the Commission cites numerous studies without assessing their implications. In fact, the EA does not provide an objective assessment of whether insiders use repurchases to inflate EPS to earn greater realized compensation. Although not discussed in the Proposal, the clearest evaluation can be found in the Commission's 2020 Staff Study, which concludes:

"[M]ost of the money spent on repurchases over the past two years was at companies that either do not link managerial compensation to EPS-based performance targets or whose boards considered the impact of repurchases when determining whether EPS-based performance targets were met or in setting the targets, suggesting that other rationales motivated the repurchases."

Further, some of the studies cited in the EA reflect an incomplete framing of the empirical evidence. For example, the EA cites a blog post that summarizes a study by Fields (2016) that interviews 44 directors serving on 95 boards. The Fields (2016) study notes that:[7]

"[M]ost directors said that their companies are aware of the relationship between buyback programs and compensation and that they make deliberate, informed choices to ensure that they reward executives for desired behavior rather than for financial manipulation of share prices."

7. See the comprehensive study: Field, R. (2016, August). *"Buybacks and the board: Director perspectives on the share repurchase revolution*," Investor Responsibility Research Center Institute (IRRC) Institute/Tapestry Network, https://www.tapestrynetworks.com/sites/default/files/publication_pdf/IRRCI%20-%20Buybacks%20_and%20the%20Board%20-%20August%202016.pdf. The blog post is available at https://corpgov.law.harvard.edu /2016/09/20/buybacks-and-the-board-director-perspectives-on-the-share-repurchase-revolution/.

In other words, share repurchase programs do not "outsmart" the careful design of executive compensation plans. Although not mentioned in the EA, Fields (2016) describes a reasonable alternative to the proposed increase in repurchase disclosure frequency:

> *"Few companies publicly disclose details about buyback decision-making and very few state which of the four reasons are driving any particular buyback program. Although a number of directors mentioned that their companies project how buyback activity will affect EPS and adjust targets accordingly, only 20 S&P 500 companies disclosed that they did so. Most companies and boards with robust buyback processes do not currently disclose enough to receive credit for their work."*

Another alternative to the Proposal would be to require in the Compensation Discussion and Analysis section of the proxy statement to disclose whether the issuer's EPS-based executive compensation plan accounts for projected or actual repurchase activity. This type of disclosure would specifically target issuers that utilize EPS bonuses and could be accomplished with relatively low-cost rulemaking or the issuance of interpretive guidance. Unfortunately, the staff of the Commission fails to consider the deterrent value of requiring issuers to describe how compensation committees adjust EPS-based bonuses for repurchases.

The baseline of the EA does not quantify the percentage of issuers' annual and long-term incentive plans that is tied to EPS and how it correlates with buybacks. The Commission already subscribes or could easily subscribe to academic databases, such as the Incentive Lab by Institutional Shareholder Services, which provide detailed data on executive compensation for members of the Standard and Poor's ("S&P") 1500, including EPS-based performance awards.

The EA also fails to quantify (1) how many issuers used share repurchases to trigger an executive bonus that would not have been earned without repurchasing shares and (2) the total executive compensation awarded from potentially opportunistic buybacks. Similar concerns were expressed in the context of the relation between share repurchases and executive pay for issuers listed in the United Kingdom ("UK"). In response, PricewaterhouseCoopers ("PwC") published a 152-page analysis under the advisory of Professor Alex Edmans in 2019 and presented these results to the UK government.[8] The PwC study found no significant relation between share repurchases and either the existence of an EPS bonus or the proportion of executive incentive awards linked to EPS.

In fact, the PwC report found no evidence of a single repurchase that triggered an EPS-based bonus. Specifically, the PwC study conducted a threshold analysis to compare issuers' EPS performance had they not repurchased shares to their EPS with the repurchase. During the period 2007 to 2017, the analysis found that:

8. See PwC. (2019, July). *Share repurchases, executive pay and investment*, Report to Department for Business, Energy & Industrial Strategy, BEIS Research Paper 2019/011, https://www.pwc.co.uk/services/ economics/insights/share-repurchases-executive-pay-and-investment.html.

> *"No firms in the sample would have been below the EPS target had they not repurchased shares and above the EPS target with the share repurchase. In other words, no firm successfully used share repurchases to beat its EPS target."*[9]

The Commission should replicate the threshold analysis of the PwC study for SEC reporting issuers and provide a full quantification of the fraction and transaction value of repurchases that successfully resulted in meeting an EPS target to achieve an executive bonus.

The PwC report also points out that even if EPS compensation targets incentivize insiders to repurchase shares, this outcome could be consistent with shareholder value maximization. For example, when an issuer chooses to return surplus cash to shareholders rather than spending this cash on inefficient investment or expenditures, the EPS target has encouraged efficient investment in repurchases, which is consistent with shareholder value maximization. Such behavior will destroy shareholder value only if an issuer engages in repurchases when it does not have surplus cash and does so by cutting investments in research and development ("R&D") or other value-enhancing investments. As we discuss below in Section I.C. of this addendum, the EA fails to cite numerous studies showing that repurchases do not sacrifice issuer investment.

The EA also omits several important studies that provide empirical evidence that fails to support the notion of using repurchases to boost executive compensation through EPS bonuses. For example, Bargeron, Kulchania, and Thomas (2011) find no evidence of a correlation between EPS-based bonuses and the types of repurchase programs that rapidly boost EPS.[10] Bennett, Bettis, Gopalan, and Milbourn (2017) examine issuers that just meet EPS compensation targets and find no evidence that share repurchases are the mechanism that facilitates this outcome.[11] Similarly, Bens, Nagar, Skinner, and Wong (2003) present evidence that repurchases are used to offset dilution from employee stock options rather than achieve an EPS-based cash bonus.[12]

Importantly, even if some repurchases are used to hit EPS targets, investors appear to "see through" this behavior under the existing quarterly repurchase disclosure regime. For example, two studies that are cited in the Proposal—Hribar, Jenkins, and Johnson (2006) and Kurt (2018)[13]—

9. By underlining key points, this excerpt replicates the emphasis of the PwC report.
10. See Bargeron, L., Kulchania, M., & Thomas, S. (2011). Accelerated share repurchases. *Journal of Financial Economics*, 101(1), 69-89. This study argues that if EPS bonus incentives were large, insiders would prefer an accelerated stock repurchase ("ASR") program over an open market repurchase program because the accretion to EPS would be accounted for immediately; however, regression evidence in their study reveals no statistical relation between ASR programs and EPS-based bonuses. We note that the Commission's 2020 Staff Study references this study, but it is omitted from the EA.
11. See Bennett, B., Bettis, J. C., Gopalan, R., & Milbourn, T. (2017). Compensation goals and firm performance. *Journal of Financial Economics*, 124(2), 307-330. This study provides causal evidence on the relation between EPS bonuses and buybacks by examining issuers that just meet EPS compensation targets to those that just miss. The authors show that firms that just meet EPS compensation targets have lower R&D and abnormal accruals, which indicates that some issuers reduce investment or adjust reported earnings to hit a compensation target. Importantly, there is no significant difference in share repurchases for these samples. These findings imply that, while some issuers might take opportunistic actions to hit performance targets, there is no evidence that share repurchases are a mechanism that facilitates those actions.
12. See Bens, D. A., Nagar, V., Skinner, D. J., & Wong, M. F. (2003). Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics*, 36(1-3), 51-90. This study reports a correlation between EPS and repurchase decisions; however, the authors find that EPS-driven cash compensation effects are not the underlying source of this relation. Instead, their evidence shows that some issuers use repurchases in an attempt to offset dilution from employee stock options in order to sustain prior growth rates in reported EPS.
13. See Hribar, P., Jenkins, N. T., & Johnson, W. B. (2006). Stock repurchases as an earnings management device. *Journal of Accounting and Economics*, 41(1-2), 3-27; and Kurt, A. C. (2018). Managing EPS and signaling undervaluation as a motivation for repurchases: The case of accelerated share repurchases. *Review of Accounting and Finance,* 17(4), 453-481.

show that the market considers whether repurchases could help the issuer hit an EPS target. In other words, under the current quarterly reporting regime, investors are not fooled by repurchases that might be used as an earnings management device.

Overall, the empirical evidence largely supports the conclusions of the SEC's 2020 Staff Study, which states the following:

> *"Collectively, these findings potentially suggest that most repurchase activity does not represent an effort to artificially inflate stock prices or influence the value of option-based or EPS-linked compensation."*

C. Repurchases and Investment

The Proposal's introduction (but not the EA) notes that some commentators view repurchases as harmful because they divert cash to shareholders that could have been used to fund investment or increase employee compensation. We note that these comments are made by (1) Senator Elizabeth Warren and (2) William Lazonick in a 2015 essay that assesses a statement by then presidential candidate Hillary Clinton.[14]

Academics, including those referenced prominently in the Proposal such as Professor Jesse Fried, have questioned this notion. In a series of academic studies, essays, and blog posts, Professor Fried and Professor Charles C.Y. Wang argue that this "accepted wisdom" is "flat out wrong."[15]

Moreover, peer-reviewed academic research by Fried and Wang (2019) refute the superficial arguments in the Lazonick essays that share repurchases harm issuers and its employees. Unfortunately, none of these discussions are in the EA.

In Lazonick (2015), the author self-cites a prior 2014 *Harvard Business Review* article titled "Profits Without Prosperity," which argues that repurchases erode employee income gains, reduce employment levels, and limit issuers' investment in long-term projects.[16] Lazonick's thesis is based on estimates that issuers in the S&P 500 index used 54% of earnings for repurchases and 37% of earnings for dividends over 2003 to 2012. Lazonick (2014) argues that this leaves only 9% of earnings to invest in future growth or employees.

Despite citing the Fried testimony three times, the Proposal fails to mention research by this author demonstrating that repurchases do not sacrifice investment nor do they harm employees. For example, Fried and Wang (2018, 2019, 2021) present empirical evidence that issuers recover approximately 80% of the cash used for dividends and buybacks by engaging in new equity capital formation.[17] Thus, the net cash returned to shareholders is less than half the amount claimed by buyback critics such as Lazonick.

14. See Lazonick, W. (2015, August 11). Clinton's proposals on stock buybacks don't go far enough. *Harvard Business Review*. We note that the link to the Lazonick essay in the Proposal is incorrectly cited as https://hbr.org/2015/08/clintons-proposals-on-stock-buybacks-dontgo-far-enough. The correct link is available at https://hbr.org/2015/08/clintons-proposals-on-stock-buybacks-dont-go-far-enough.
15. See Fried, J., & Wang, C.C.Y. (2019, March 13). *Democratic senators and the buyback boogeyman*. Harvard Law School Forum on Corporate Governance, https://corpgov.law.harvard.edu/2019/03/13/ democratic-senators-and-the-buyback-boogeyman/.
16. See Lazonick, W. (2014, September). Profits without prosperity. *Harvard Business Review*, 46-55, https://hbr.org/2014/09/profits-without-prosperity.
17. *See* Fried, J. M., & Wang, C. C. (2018, March-April). Are buybacks really shortchanging investment? *Harvard Business Review,* 88-95, https://hbr.org/2018/03/are-buybacks-really-shortchanging-investment; Fried, J. M., & Wang, C. C. (2019). Short-termism and capital flows. *Review of Corporate Finance Studies*, 8(1), 207-233; and Fried, J. M., & Wang, C. C. (2021). Short-termism, shareholder payouts and investment in the EU. *European Financial Management*, 27(3), 389-413.

Fried and Wang also note that estimating the payout ratio as a percentage of net income—as in Lazonick (2014)—fails to recognize the basic, fundamental accounting principle that net income already deducts R&D expenditures, which they estimate accounts for 25% to 30% of net income. Fried and Wang (2018, 2019, 2021) highlight flaws in viewing stock buybacks and investments as substitutes. The authors' evidence indicates that issuers can make all of the investment in capital expenditures and R&D that managers deem necessary—while still being able to repurchase shares from *surplus* cash. Thus, buybacks do not shortchange investments in the company and its employees.

The EA also misses an opportunity to discuss other literature on this topic. For example, Asness, Hazelkorn, and Richardson (2018) present empirical evidence that repurchases do not mechanically grow earnings or reduce investment.[18]

Edmans (2017, 2020) also argues that issuers do not systematically misuse cash for repurchases. He contends that such claims put the "cart before the horse" since issuers first allocate cash to investment based on projects that generate a return higher than the issuers' cost of capital.[19] Only surplus cash is used for repurchases, which is consistent with survey evidence in Brav, Graham, Harvey, and Michaely (2005) that issuers fund repurchases with residual cash flow after funding investment. Although the EA cites the 2005 Brav et al. study four times, it fails to point out that this survey provides evidence that pushes back on the notion that repurchases sacrifice investment.

In one of the few discussions of the relation between repurchase and investment or employees, Footnote 80 of the EA points to a study by Almeida, Fos, and Kronlund (2016):

> *"EPS-motivated repurchases are associated with reductions in employment and investment, and a decrease in cash holdings" and concluding that "managers are willing to trade off investments and employment for stock repurchases that allow them to meet analyst EPS forecasts."*

Yet, a more thorough assessment of this study would uncover their statement that "[i]t is clear that EPS-induced repurchases are on average not detrimental to shareholder value or subsequent performance."

The EA also fails to recognize the findings of the Commission's own 2020 Staff Study, which clearly notes in its conclusion that "most repurchases are conducted by companies with excess cash relative to investment opportunities."

Moreover, although the Proposal cites Congressional testimony by Professor Jesse Fried numerous times, it fails to consider other testimony provided during the same subhearing. For example, Professor Craig Lewis opines that:[20]

> *"Opponents of share buyback programs typically argue that they: 1) artificially inflate share price, 2)*

18. See Asness, C., Hazelkorn, T., & Richardson, S. (2018). Buyback derangement syndrome. *Journal of Portfolio Management*, 44(5), 50-57.
19. See Edmans, A. (2017, September 15). The case for stock buybacks. *Harvard Business Review*; and Edmans, A. (2020). *Grow the pie: How great companies deliver both purpose and profit*. Cambridge University Press.
20. See Lewis, C. M. (2019, October 17). Examining corporate priorities: The impact of stock buybacks on workers, communities, and investment, Testimony of Craig M. Lewis before the U.S. House of Representatives Subcommittee on Investor Protection, Entrepreneurship, and Capital Markets, https://financialservices.house.gov/ uploadedfiles/hhrg-116-ba16-wstate-lewisc-20191017.pdf.

crowd out investment, 3) result from managerial short-termism, and 4) disproportionately benefit the wealthy and corporate insiders. I argue that these conjectures are either not supported by empirical analysis or are based on misconceptions about the how share repurchase programs actually operate."

Professor Lewis provides empirical evidence demonstrating the repurchases are an efficient method for distributing surplus cash.[21]

Overall, the EA fails to deliver robust discussion of the economic implications of buybacks for corporate investment.

D. Repurchases to Manipulate Markets

In the Proposal, the Commission notes that:

"With respect to share repurchase announcements, some have suggested that managers may take advantage of positive stock price reactions to non-binding repurchase announcements and use disingenuous repurchase announcements to manipulate share prices."

As evidence of these allegations of market manipulation, the Proposal cites a study by Chen, Ikenberry, Wang, and Lee (2010), who note that some issuers misled investors by announcing share repurchases that the issuer did not execute. This study examines a sample period that predates the Commission's 2003 requirement that issuers report aggregated monthly repurchase activity on a quarterly basis (Item 703).[22] Such actions could be considered "cheap talk," where issuers might announce a buyback authorization that they do not intend to execute in hopes that it will lead to short-term stock price appreciation. However, the 2010 Chen et al. paper clearly states:

"Moreover, as we subdivide the evidence further, we also conclude that the total number of buybacks where managers may have been intending to mislead investors, while non-zero, also appears to be limited."

This finding does not represent a systematic market failure that requires the formal alteration of disclosure obligations. Moreover, the study is incapable of determining if there was an intent to deceive investors or whether changing business conditions now favor the execution of a repurchase program. At a minimum, the EA should replicate the approach in this study—a duration of 21 years—to determine if these limited instances of misleading investors continue to occur after the 2003 changes in repurchase disclosure frequency.

In fact, claims that repurchases are conducted to manipulate stock prices are inconsistent with the conclusions of the 2020 SEC Staff Study (p. 45), which states that:

21. See Lewis, C. M. (2019). The economics of share repurchase programs. Report commissioned by the Association of Mature American Citizens, https://amac.us/wp-content/uploads/2019/02/The-Economics-of-Share-Repurchase-Programs1.pdf.
22. See Chan, K., Ikenberry, D. L., Lee, I., & Wang, Y. (2010). Share repurchases as a potential tool to mislead investors. Journal of Corporate Finance, 16(2), 137-158; and Purchases of Certain Equity Securities by the Issuer and Others, Release No. 33-8335 (Nov. 10, 2003) [68 FR 64952 (Nov. 17, 2003)].

"[R]epurchase announcements are accompanied by stock price increases. This announcement effect does not dissipate over time, as one would expect if repurchases were based on efforts to manipulate share prices."

Given the scarce evidence that share repurchase announcements are used to mislead markets—and that the Commission's own staff found no cross-sectional evidence of manipulative buyback activity—the EA fails to demonstrate a market failure that warrants the proposed rulemaking.[23]

II. Impact of More Frequent Disclosure on Information Asymmetry

The Proposal describes how asymmetric information might be reduced by increasing buyback disclosure frequency but does not explain why the current level of transparency would be considered a market failure. The Proposal notes:

> *"[A] lack of timely disclosure could contribute to information asymmetries between investors and issuers/insiders."*

The Proposal then conjectures that a lack of timely disclosure could lead to the market failure of *asymmetric information* between investors and issuers or insiders. The only substantive discussion of information asymmetry occurs in the introduction and is, once again, missing from the EA:

> *"In particular, we are concerned that, because issuers are repurchasing their own securities, asymmetries may exist between issuers and affiliated purchasers and investors with regard to information about the issuer and its future prospects. This, in turn, could exacerbate some of the potential harms associated with issuer repurchases. To help address these information asymmetries, we are proposing a new disclosure form and additional disclosure requirements about issuer repurchases."*

The EA fails to note that asymmetric information is present in all market settings and can hardly be characterized as a market failure. Without some level of asymmetric information, there would be fewer incentives to invest in information collection, resulting in less price discovery and a corresponding reduction in liquidity (see, e.g., Grossman and Stiglitz, 1980).[24]

The EA argues that more frequent disclosure of repurchase activity might reduce information asymmetries between investors and issuers/insiders, which could result in greater stock price liquidity and a lower cost of equity capital. The EA posits:

23. Although the EA does not present widespread empirical evidence of market manipulation through repurchase cheap talk, it notes in Footnote 79 that even the highest concerns of manipulation do not prevent the positive effect of repurchases on price efficiency. See Busch, P., & Obernberger, S. (2017). Actual share repurchases, price efficiency, and the information content of stock prices. *Review of Financial Studies*, 30(1), 324-362.
24. See Grossman, S. J., & Stiglitz, J. E. (1980). On the impossibility of informationally efficient markets. *American Economic Review*, 70(3), 393-408.

> *"We expect the proposed amendments to have positive effects on efficiency and capital formation. In particular, any decrease in the information asymmetry between issuers and investors about the value of an issuer's securities as a result of the disclosure could lead to more informationally efficient prices, and more efficient capital allocation in investor portfolios. Decreased information asymmetries between investors and issuers as a result of the enhanced disclosure under the proposed amendments could also incrementally facilitate capital formation and reduce the cost of capital. It is difficult to determine the incremental contribution of the proposed amendments and thus the magnitude of this potential benefit."*

Although some degree of information asymmetry will always exist between issuers and investors, the EA does not demonstrate that more frequent repurchase disclosures will have a large enough effect on capital costs or liquidity to outweigh any direct or indirect costs of additional disclosure burdens.[25] For asymmetric information to be considered a market failure, the Commission would need to robustly demonstrate that insiders act in their own self-interest to produce an outcome that is economically harmful to other stakeholders. The lack of such evidence likely explains the use of qualifying language (e.g., "could lead to") in the EA's description of potential benefits.

Within the EA, the Commission cites three studies linking decreases in information asymmetry to lower capital costs (Easley and O'Hara, 2004;[26] Botosan, 2006; and Lambert, Leuz, and Verrecchia, 2007). These studies are largely cross-sectional analyses that make general inferences about reductions in asymmetric information. While informative, these studies are not dispositive in the sense that they do not specifically discuss share repurchase activity. The question that the EA needs to address is whether similar effects are associated with more frequent and timely repurchase disclosures.

To this end, the EA claims it is too difficult to quantify the incremental benefits of potential reductions in asymmetric information stemming from the proposed amendments. As such, it fails to present quantitative evidence to support the conjecture that the net effect would reduce issuers' cost of capital. There are, however, analyses the Commission could have conducted to address the necessity of more frequent disclosure of share repurchase activity. For example, the Commission could examine how investors react to more frequent repurchase disclosure across or within jurisdictions outside the United States. The staff could quantify the marginal impact of repurchase disclosure on liquidity or capital costs. Many academic studies use market and trading-based measures of liquidity—such as Amihud's Illiquidity—to empirically measure the impact of incremental issuer disclosures on liquidity.[27] In fact, the studies cited in

25. At the margin, regulatory mandated transparency reduces incentives to engage in price discovery and could have the unintended consequence of reduced liquidity. Following Grossman and Stiglitz (1980), markets would indeed be more efficient with respect to information related to share repurchases but could have the countervailing effect of being less efficient with respect to other information that might have been discovered had investors been willing to invest in independent research. Without quantification, it is difficult to assess which consideration dominates.
26. The paper by Easley and O'Hara is incorrectly cited in the Proposal as being published in 2005. It was published in the August 2004 issue of the *Journal of Finance*.
27. See, for example, Balakrishnan, K., Billings, M. B., Kelly, B., & Ljungqvist, A. (2014). Shaping liquidity: On the causal effects of voluntary disclosure. *Journal of Finance,* 69(5), 2237-2278. In this study, the authors link voluntary management earnings forecasts to decreases in Amihud's trading-based measure of illiquidity. For a discussion on this measure, see Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, 5(1), 31-56.

Footnote 105 utilize measures of information asymmetry and liquidity, such as the bid-ask spread (Amihud and Mendelson, 1986) and the probability of an informed trade, or "PIN" (Duarte and Young, 2009).

Alternatively, the EA could have used the quasi-natural experiments related to more frequent disclosures in other jurisdictions. For example, the EA notes that "a number of foreign jurisdictions require disclosure of greater frequency and timeliness, relative to current U.S. requirements." The EA references studies of other jurisdictions with monthly (France) and daily (Hong Kong) repurchase disclosure requirements (Ginglinger and Hamon, 2007; Brockman and Chung, 2001). At a minimum, the Commission could compare liquidity measures of similarly sized issuers operating in the same industry that conduct buybacks across countries with quarterly (U.S.), monthly (France), and daily ("UK" or Hong Kong) repurchase disclosure requirements. Such an analysis would help establish whether higher frequency disclosures have a measurable influence on market-based measures of liquidity and information asymmetry.

Another possible avenue for quantification that the Commission does not consider would be to estimate the incremental information associated with next-day reporting for firms in jurisdictions requiring such disclosure—because the information contained in order flow on the day that a repurchase occurs would be impounded into stock prices. Next-day disclosure would be expected to resolve residual uncertainty regarding the identity of the parties. Such an analysis would quantify the marginal impact of next-day disclosure requirements. In fact, the EA implicitly recognizes that the incremental information associated with share repurchases may already be reflected in shares prices and that the disclosure itself may not convey economically important information:

> *"The benefit of the information contained in a disclosure of recent repurchase activity would be lower to the extent that large issuer repurchases already have a price impact, resulting in price discovery and indirect revelation of information to the market, even in the absence of daily disclosure."*

By ignoring this issue, the EA fails to quantify the benefit of the proposed amendments, even though the SEC had the ability and resources to directly analyze the economic impact of more frequent disclosure. In fact, Footnote 89 of the EA admits that a study by Brockman and Chung (2001) shows that variation in repurchase frequency does not appear to influence the impact of share repurchases on liquidity:[28]

> *"[T]hey compare their findings with those from a foreign regime with a different reporting frequency and extrapolate that "[t]he similarity of our results to the results for the Hong Kong market indicates that the choice of whether to require firms to disclose repurchases one day versus one month after execution does not affect the impact of share repurchases on liquidity"; while the study further concludes that this suggests "that there are limited benefits from requiring greater post-trade transparency of*

28. See Brockman, P., & Chung, D. Y. (2001). Managerial timing and corporate liquidity: Evidence from actual share repurchases. *Journal of Financial Economics*, 61(3), 417-448.

share repurchases, the conclusion that greater disclosure of repurchases would have limited benefits, in our view, does not follow from the similarity of the effects of repurchases on liquidity in the two countries referenced in the study. As a further caveat, there are potentially significant comparability issues in evaluating data from different jurisdictions, which have varying legal and market conditions for repurchases."

Rather than provide this comparison, the EA simply caveats that variation in legal jurisdictions lead to comparability issues.[29] However, such differences could be addressed in a regression model that examines (or matches) on variation in the properties of periodic and ongoing disclosure obligations.[30]

The EA also notes that numerous studies attest market quality and liquidity are higher during repurchase periods under the current system of quarterly reporting of repurchase activity (e.g., Busch and Obernberger, 2017; Hillert et al. 2016). Thus, substantial evidence cited in the EA already calls into question the notion that greater repurchase disclosure frequency will necessarily manifest into material stock liquidity improvements, because the information contained in order flow may subsume much of the information that would be contained in more frequent disclosure.

In support of this notion, recent work by Lewis and White (2021) shows a large, positive impact of buybacks on liquidity during repurchase periods.[31] Lewis and White study a large sample of more than 10,000 U.S. companies over 17 years and find that issuers utilize repurchases to increase stock liquidity and reduce volatility, which stabilizes stock prices. They find that buybacks significantly reduce both realized and anticipated return volatility. The authors' analysis shows that buybacks generate an economically large benefit for all investors, including retail investors who saved between $2.1 billion and $4.2 billion in transaction and price impact costs due to buybacks since 2004. They find that issuers utilize market-based estimates of future volatility to inform their buyback decisions and that when volatility is expected to be higher, issuers increase their buyback intensity to stabilize stock prices, thereby reducing costs for retail investors. Issuers respond to exogenous variation in economic policy uncertainty by strengthening their buyback activities. Issuers also expand buyback activity during critical periods when current investors sell relatively large amounts of shares. Thus, managers use buybacks to actively mitigate price pressure during periods of net selling.

The EA also fails to consider whether daily disclosure could result in so many repurchase filings that it essentially creates "noise" in the disclosure regime.

29. The following discussion is found on page 47 of the Proposal: "*While we could not find studies analyzing empirically how the introduction of more frequent disclosure affected buybacks in foreign countries, we also were not able to find evidence that such disclosure requirements adversely affected shareholder value or market participants. The broad application of a disclosure requirement to issuers in a given jurisdiction makes it hard to formulate an empirical setting, such as a quasi-natural experiment, that effectively addresses the question of how the introduction of the disclosure affected buybacks and issuers that undertake them. Moreover, there are potentially significant differences between jurisdictions with respect to other repurchase regulations, market structure, taxation, composition of the subset of issuers that undertake repurchases, and the subset of investors in such issuers, complicating cross-country comparisons or extrapolation from international studies to the U.S. setting.*"
30. For example, see the approach in Boone, A. L., Schumann-Foster, K., & White, J. T. (2021). Ongoing SEC disclosures by foreign firms. *The Accounting Review*, 96(3), 91-120.
31. See Lewis, C. M., & White, J. T. (2021). Corporate liquidity provision and share repurchase programs. U.S. Chamber of Commerce: Center for Capital Markets Competitiveness, Fall 2021. Available at https://www.centerforcapitalmarkets.com/wp-content/uploads/2021/09/CCMC_Stock-Buybacks_WhitePaper_10.2.21.pdf.

This concern should be considered because prior academic work notes that "too much disclosure can be as costly as too little disclosure."[32]

Taken together, the EA fails to robustly demonstrate the conjectured benefits of greater repurchase disclosure frequency on stock liquidity, capital costs, and capital formation; instead, the EA provides a subjective discussion that fails to fully recognize the role of price discovery and existing studies that empirically link repurchase activity to greater liquidity under the current quarterly repurchase disclosure regime.

III. Summary of Economic Analysis

In this comment letter, we evaluate the Proposal to increase disclosure requirements for share repurchases. Specifically, we analyze the accompanying EA to assess whether it presents a robust cost-benefit analysis that objectively informs the Proposal.

As we demonstrate above, the EA fails to convincingly demonstrate that the Proposal has merit. The EA neglects to demonstrate a market failure that requires regulation; inaccurately or incompletely characterizes the baseline; and omits important citations of studies that could inform the proposed rulemaking. Moreover, the Proposal relies heavily on an analysis by former SEC Commissioner Robert Jackson that contains empirical flaws.

The EA also largely fails to quantify the likely economic impact of the Proposal and instead argues that these analyses are infeasible due to data limitations and that "much of the discussion remains qualitative in nature." Although this is a common problem that Commission staff must confront when developing EAs, our comment letter identifies many straightforward methods to quantify the alleged market failures and the potential incremental benefits of the Proposal. Further, we highlight instances where the Commission's own 2020 SEC Staff Study provides such quantification, which explicitly refutes many of the ostensible market failures referenced in the Proposal.

Taken together, the Proposal and accompanying EA fail to present robust evidence of a market failure attributable to the current disclosure requirements for share repurchases. We conclude that the Commission has failed to establish a need for additional rulemaking that deviates from the status quo.

32. See Core, J. E. (2001). A review of the empirical disclosure literature: Discussion. *Journal of Accounting and Economics,* 31(1-3), 441-456. Core notes that too much disclosure can result in stock price volatility that attracts high-frequency traders and cites Bushee and Noe (2000). See Bushee, B. J., & Noe, C. F. (2000). Corporate disclosure practices, institutional investors, and stock return volatility. *Journal of Accounting Research*, 38, 171-202.

IV. Appendix A. Studies Cited in Proposal

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
1	Buybacks used by insiders to influence stock prices	1	Chan, K., Ikenberry, D. L., Lee, I., & Wang, Y. (2010). Share repurchases as a potential tool to mislead investors. *Journal of Corporate Finance*, 16(2), 137-158.	FN14, FN79, FN81	I. Introduction; IV. EA
1	Buybacks used by insiders to influence stock prices	2	Palladino, L. (2020). Do corporate insiders use stock buybacks for personal gain? *International Review of Applied Economics*, 34(2), 152-174.	FN15, FN81	I. Introduction; IV. EA
1	Buybacks used by insiders to influence stock prices	3	Palladino, L. & Lazonick, W. (2021, May). Regulation Stock Buybacks: The $6.3 Trillion Question, *Roosevelt Institute Working Paper*.	FN15, FN17	I. Introduction
1	Buybacks used by insiders to influence stock prices	4	SEC Staff Response to Congress: Negative Net Equity Issuance, December 2020.	FN58, FN59, FN60, FN63, FN70, FN80	IV. EA
1	Buybacks used by insiders to influence stock prices	5	Jackson, Jr., R. J., (2018, June 11). *Stock buybacks and corporate cashouts*, Speech by Commissioner Jackson before the Center for American Progress.	FN15, FN17	I. Introduction
2	Buyback disclosure informs market participants	6	Bonaimé, A. A. (2015). Mandatory disclosure and firm behavior: Evidence from share repurchases. *The Accounting Review*, 90(4), 1333-1362.	FN27, FN79, FN86, FN99	II. Proposed Amendments; IV. EA
3	Broad study of buybacks	7	Grullon, G., & Ikenberry, D. L. (2000). What do we know about stock repurchases? *Journal of Applied Corporate Finance*, 13(1), 31-51.	FN28	II. Proposed Amendments
3	Broad study of buybacks	8	Farre-Mensa, J., Michaely, R., & Schmalz, M. (2014). Payout policy. *Annual Review of Financial Economics*, 6(1), 75-134.	FN58, FN64, FN70	IV. EA
4	Buybacks fluctuate during economic cycles	9	Campello, M., Graham, J. R., & Harvey, C. R. (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics*, 97(3), 470-487.	FN60	IV. EA
4	Buybacks fluctuate during economic cycles	10	Dittmar, A. K., & Dittmar, R. F. (2008). The timing of financing decisions: An examination of the correlation in financing waves. *Journal of Financial Economics*, 90(1), 59-83.	FN60, FN66	IV. EA
4	Buybacks fluctuate during economic cycles	11	Floyd, E., Li, N., & Skinner, D. J. (2015). Payout policy through the financial crisis: The growth of repurchases and the resilience of dividends. *Journal of Financial Economics*, 118(2), 299-316.	FN60	IV. EA
5	Buybacks are less of a commitment than dividends	12	Healy, P. M., & Palepu, K. G. (1988). Earnings information conveyed by dividend initiations and omissions. *Journal of Financial Economics*, 21(2), 149-175.	FN61	IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
5	Buybacks are less of a commitment than dividends	13	Michaely, R., Thaler, R. H., & Womack, K. L. (1995). Price reactions to dividend initiations and omissions: Overreaction or drift? *Journal of Finance*, 50(2), 573-608.	FN61	IV. EA
5	Buybacks are less of a commitment than dividends	14	Lee, B. S., & Mauck, N. (2016). Dividend initiations, increases and idiosyncratic volatility. *Journal of Corporate Finance*, 40, 47-60.	FN61	IV. EA
5	Buybacks are less of a commitment than dividends	15	Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics*, 77(3), 483-527.	FN62, FN72, FN78, FN83	IV. EA
6	Buybacks substitute for dividends	16	Skinner, D. J. (2008). The evolving relation between earnings, dividends, and stock repurchases. *Journal of Financial Economics*, 87(3), 582-609.	FN63	IV. EA
6	Buybacks substitute for dividends	17	Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *Journal of Finance*, 57(4), 1649-1684.	FN63	IV. EA
7	Buybacks signal stock is undervalued	18	Vermaelen, T. (1981). Common stock repurchases and market signalling: An empirical study. Journal of Financial Economics, 9(2), 139-183.	FN65	IV. EA
7	Buybacks signal stock is undervalued	19	Vermaelen, T. (1984). Repurchase tender offers, signaling, and managerial incentives. *Journal of Financial and Quantitative Analysis*, 19(2), 163-181.	FN65	IV. EA
7	Buybacks signal stock is undervalued	20	Constantinides, G. M., & Grundy, B. D. (1989). Optimal investment with stock repurchase and financing as signals. *Review of Financial Studies*, 2(4), 445-465.	FN65	IV. EA
7	Buybacks signal stock is undervalued	21	Hausch, D. B., & Seward, J. K. (1993). Signaling with dividends and share repurchases: A choice between deterministic and stochastic cash disbursements. *Review of Financial Studies*, 6(1), 121-154.	FN65	IV. EA
7	Buybacks signal stock is undervalued	22	McNally, W. J. (1999). Open market stock repurchase signaling. *Financial Management*, 55-67.	FN65	IV. EA
7	Buybacks signal stock is undervalued	23	Ofer, A. R., & Thakor, A. V. (1987). A theory of stock price responses to alternative corporate cash disbursement methods: Stock repurchases and dividends. *Journal of Finance*, 42(2), 365-394.	FN65	IV. EA
7	Buybacks signal stock is undervalued	24	Persons, J. C. (1997). Heterogeneous shareholders and signaling with share repurchases. *Journal of Corporate Finance*, 3(3), 221-249.	FN65	IV. EA
8	Stock price changes after buybacks	25	Dittmar, A., & Field, L. C. (2015). Can managers time the market? Evidence using repurchase price data. *Journal of Financial Economics*, 115(2), 261-282.	FN66, FN82, FN84	IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
8	Stock price changes after buybacks	26	Ben-Rephael, A., Oded, J., & Wohl, A. (2014). Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Review of Finance*, 18(4), 1299-1340.	FN66, FN84	IV. EA
8	Stock price changes after buybacks	27	Chan, K., Ikenberry, D. L., & Lee, I. (2007). Do managers time the market? Evidence from open-market share repurchases. *Journal of Banking & Finance*, 31(9), 2673-2694.	FN66, FN85	IV. EA
8	Stock price changes after buybacks	28	Cook, D. O., Krigman, L., & Leach, J. C. (2004). On the timing and execution of open market repurchases. *Review of Financial Studies*, 17(2), 463-498.	FN66	IV. EA
8	Stock price changes after buybacks	29	Obernberger, S. (2014). The timing of actual share repurchases. Available at SSRN 2434214.	FN66	IV. EA
8	Stock price changes after buybacks	10	Dittmar, A. K., & Dittmar, R. F. (2008). The timing of financing decisions: An examination of the correlation in financing waves. *Journal of Financial Economics*, 90(1), 59-83.	FN60, FN66	IV. EA
8	Stock price changes after buybacks	30	Bonaimé, A. A., Hankins, K. W., & Jordan, B. D. (2016). The cost of financial flexibility: Evidence from share repurchases. *Journal of Corporate Finance*, 38, 345-362.	FN66	IV. EA
8	Stock price changes after buybacks	31	Evgeniou, T., de Fortuny, E. J., Nassuphis, N., & Vermaelen, T. (2018). Volatility and the buyback anomaly. *Journal of Corporate Finance*, 49, 32-53.	FN66	IV. EA
8	Stock price changes after buybacks	32	Bargeron, L., Bonaime, A., & Thomas, S. (2017). The timing and source of long-run returns following repurchases. *Journal of Financial and Quantitative Analysis*, 52(2), 491-517.	FN66	IV. EA
8	Stock price changes after buybacks	33	Peyer, U., & Vermaelen, T. (2009). The nature and persistence of buyback anomalies. *Review of Financial Studies*, 22(4), 1693-1745.	FN66	IV. EA
8	Stock price changes after buybacks	34	Fu, F., & Huang, S. (2016). The persistence of long-run abnormal returns following stock repurchases and offerings. *Management Science*, 62(4), 964-984.	FN66	IV. EA
9	Buybacks supply liquidity during selling pressure	35	Liu, H., & Swanson, E. P. (2016). Is price support a motive for increasing share repurchases? *Journal of Corporate Finance*, 38, 77-91.	FN67, FN81	IV. EA
10	Buybacks reduce agency costs of equity	36	Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2), 323-329.	FN71	IV. EA
10	Buybacks reduce agency costs of equity	15	Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics*, 77(3), 483-527.	FN62, FN72, FN78, FN83	IV. EA
10	Buybacks reduce agency costs of equity	37	Grullon, G., & Michaely, R. (2004). The information content of share repurchase programs. *Journal of Finance*, 59(2), 651-680.	FN73	IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
11	Buybacks are flexible	38	Guay, W., & Harford, J. (2000). The cash-flow permanence and information content of dividend increases versus repurchases. *Journal of Financial Economics*, 57(3), 385-415.	FN74	IV. EA
11	Buybacks are flexible	39	Jagannathan, M., Stephens, C. P., & Weisbach, M. S. (2000). Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics*, 57(3), 355-384.	FN74	IV. EA
11	Buybacks are flexible	40	Hoberg, G., & Prabhala, N. R. (2008). Disappearing dividends, catering, and risk. *Review of Financial Studies*, 22(1), 79-116.	FN75	IV. EA
12	Buybacks are tax efficient	41	Feng, L., Pukthuanthong, K., Thiengtham, D., Turtle, H. J., & Walker, T. J. (2013). The Effects of Cash, Debt, and Insiders on Open Market Share Repurchases. *Journal of Applied Corporate Finance*, 25(1), 55-63.	FN76	IV. EA
13	Buybacks are used to adjust target leverage	42	Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, 57(1), 1-32.	FN77	IV. EA
13	Buybacks are used to adjust target leverage	43	Ma, Y. (2019). Nonfinancial firms as cross-market arbitrageurs. *Journal of Finance*, 74(6), 3041-3087.	FN77	IV. EA
13	Buybacks are used to adjust target leverage	44	Hovakimian, A. (2004). The role of target leverage in security issues and repurchases. *Journal of Business*, 77(4), 1041-1072.	FN77	IV. EA
14	Buybacks are used for real earnings management	45	Burnett, B. M., Cripe, B. M., Martin, G. W., & McAllister, B. P. (2012). Audit quality and the trade-off between accretive stock repurchases and accrual-based earnings management. *The Accounting Review*, 87(6), 1861-1884.	FN78	IV. EA
14	Buybacks are used for real earnings management	15	Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics*, 77(3), 483-527.	FN62, FN72, FN78, FN83	IV. EA
14	Buybacks are used for real earnings management	46	Hribar, P., Jenkins, N. T., & Johnson, W. B. (2006). Stock repurchases as an earnings management device. *Journal of Accounting and Economics*, 41(1-2), 3-27.	FN78	IV. EA
14	Buybacks are used for real earnings management	47	Kurt, A. C. (2018). Managing EPS and signaling undervaluation as a motivation for repurchases: The case of accelerated share repurchases. *Review of Accounting and Finance*.	FN78	IV. EA
14	Buybacks are used for real earnings management	48	Almeida, H., Fos, V., & Kronlund, M. (2016). The real effects of share repurchases. *Journal of Financial Economics*, 119(1), 168-185.	FN78, FN80	IV. EA
14	Buybacks are used for real earnings management	49	Ezekoye, O., Koller, T., & Mittal, A. (2016, April 29). How share repurchases boost earnings without improving returns, *McKinsey*.	FN78	IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
15	Buybacks provide price support even when manipulation concerns are high	50	Busch, P., & Obernberger, S. (2017). Actual share repurchases, price efficiency, and the information content of stock prices. *Review of Financial Studies*, 30(1), 324-362.	FN79, FN81, FN85, FN98	IV. EA
16	Issuers do not complete all announced buybacks	1	Chan, K., Ikenberry, D. L., Lee, I., & Wang, Y. (2010). Share repurchases as a potential tool to mislead investors. *Journal of Corporate Finance*, 16(2), 137-158.	FN14, FN79, FN81	I. Introduction; IV. EA
16	Issuers do not complete all announced buybacks	51	Bonaimé, A. A. (2012). Repurchases, reputation, and returns. *Journal of Financial and Quantitative Analysis*, 47(2), 469-491.	FN79, FN95	IV. EA
16	Issuers do not complete all announced buybacks	6	Bonaimé, A. A. (2015). Mandatory disclosure and firm behavior: Evidence from share repurchases. *The Accounting Review*, 90(4), 1333-1362.	FN27, FN79, FN86, FN99	II. Proposed Amendments; IV. EA
16	Issuers do not complete all announced buybacks	52	Almazan, A., Banerji, S., & Motta, A. D. (2008). Attracting attention: Cheap managerial talk and costly market monitoring. *Journal of Finance*, 63(3), 1399-1436.	FN79	IV. EA
16	Issuers do not complete all announced buybacks	53	Bhattacharya, U., & E. Jacobsen, S. (2016). The share repurchase announcement puzzle: Theory and evidence. *Review of Finance*, 20(2), 725-758.	FN79	IV. EA
17	Buybacks are used to boost executive pay	54	Cheng, Y., Harford, J., & Zhang, T. T. (2015). Bonus-driven repurchases. *Journal of Financial and Quantitative Analysis*, 50(3), 447-475.	FN80, FN106	IV. EA
17	Buybacks are used to boost executive pay	55	Kim, S., & Ng, J. (2018). Executive bonus contract characteristics and share repurchases. *The Accounting Review*, 93(1), 289-316.	FN80	IV. EA
17	Buybacks are used to boost executive pay	56	Young, S., & Yang, J. (2011). Stock repurchases and executive compensation contract design: The role of earnings per share performance conditions. *The Accounting Review*, 86(2), 703-733.	FN80	IV. EA
17	Buybacks are used to boost executive pay	48	Almeida, H., Fos, V., & Kronlund, M. (2016). The real effects of share repurchases. *Journal of Financial Economics*, 119(1), 168-185.	FN78, FN80	IV. EA
17	Buybacks are used to boost executive pay	4	SEC Staff Response to Congress: Negative Net Equity Issuance, December 2020.	FN58, FN59, FN60, FN63, FN70, FN80	IV. EA
17	Buybacks are used to boost executive pay via EPS	57	Fields, R. (2016, September 20). Buybacks and the board: Director perspectives on the share repurchase revolution, https://corpgov.law.harvard.edu/2016/09/20/buybacks-and-the-board-director-perspectives-on-the-share- repurchase-revolution/.	FN80	IV. EA
18	Buybacks are used to boost executive pay via stock prices	1	Chan, K., Ikenberry, D. L., Lee, I., & Wang, Y. (2010). Share repurchases as a potential tool to mislead investors. *Journal of Corporate Finance*, 16(2), 137-158.	FN14, FN79, FN81	I. Introduction; IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
18	Buybacks are used to boost executive pay via stock prices	58	Bonaimé, A. A., & Ryngaert, M. D. (2013). Insider trading and share repurchases: Do insiders and firms trade in the same direction? *Journal of Corporate Finance*, 22, 35-53.	FN81, FN82	IV. EA
18	Buybacks are used to boost executive pay via stock prices	59	Cziraki, P., Lyandres, E., & Michaely, R. (2021). What do insiders know? Evidence from insider trading around share repurchases and SEOs. *Journal of Corporate Finance*, 66, 101544.	FN81, FN82	IV. EA
18	Buybacks are used to boost executive pay via stock prices	2	Palladino, L. (2020). Do corporate insiders use stock buybacks for personal gain? *International Review of Applied Economics*, 34(2), 152-174.	FN15, FN81	I. Introduction; IV. EA
18	Buybacks are used to boost executive pay via stock prices	60	Ahmed (2017). Insider trading around open-market share repurchases. Working Paper.	FN81	IV. EA
18	Buybacks are used to boost executive pay via stock prices	61	Edmans, A., Goncalves-Pinto, L., Groen-Xu, M., & Wang, Y. (2018). Strategic news releases in equity vesting months. *Review of Financial Studies*, 31(11), 4099-4141.	FN81	IV. EA
18	Buybacks are used to boost executive pay via stock prices	62	Edmans, A., Fang, V. W., & Huang, A. (2017). *The long-term consequences of short-term incentives*. European Corporate Governance Institute (ECGI)-Finance Working Paper, (527).	FN81	IV. EA
18	Buybacks are used to boost executive pay via stock prices	35	Liu, H., & Swanson, E. P. (2016). Is price support a motive for increasing share repurchases? *Journal of Corporate Finance*, 38, 77-91.	FN67, FN81	IV. EA
18	Buybacks are used to boost executive pay via stock prices	50	Busch, P., & Obernberger, S. (2017). Actual share repurchases, price efficiency, and the information content of stock prices. *Review of Financial Studies*, 30(1), 324-362.	FN79, FN81, FN85, FN98	IV. EA
19	Buybacks are timed with insider purchases to send credible signal	25	Dittmar, A., & Field, L. C. (2015). Can managers time the market? Evidence using repurchase price data. *Journal of Financial Economics*, 115(2), 261-282.	FN66, FN82, FN84	IV. EA
19	Buybacks are timed with insider purchases to send credible signal	63	Babenko, I., Tserlukevich, Y., & Vedrashko, A. (2012). The credibility of open market share repurchase signaling. *Journal of Financial and Quantitative Analysis*, 47(5), 1059-1088.	FN82	IV. EA
19	Buybacks are timed with insider purchases to send credible signal	58	Bonaimé, A. A., & Ryngaert, M. D. (2013). Insider trading and share repurchases: Do insiders and firms trade in the same direction? *Journal of Corporate Finance*, 22, 35-53.	FN81, FN82	IV. EA
19	Buybacks are timed with insider purchases to send credible signal	59	Cziraki, P., Lyandres, E., & Michaely, R. (2021). What do insiders know? Evidence from insider trading around share repurchases and SEOs. *Journal of Corporate Finance*, 66, 101544.	FN81, FN82	IV. EA
20	Issuers conduct buybacks when prices are low	15	Brav, A., Graham, J. R., Harvey, C. R., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics*, 77(3), 483-527.	FN62, FN72, FN78, FN83	IV. EA
20	Issuers conduct buybacks when prices are low	25	Dittmar, A., & Field, L. C. (2015). Can managers time the market? Evidence using repurchase price data. *Journal of Financial Economics*, 115(2), 261-282.	FN66, FN82, FN84	IV. EA

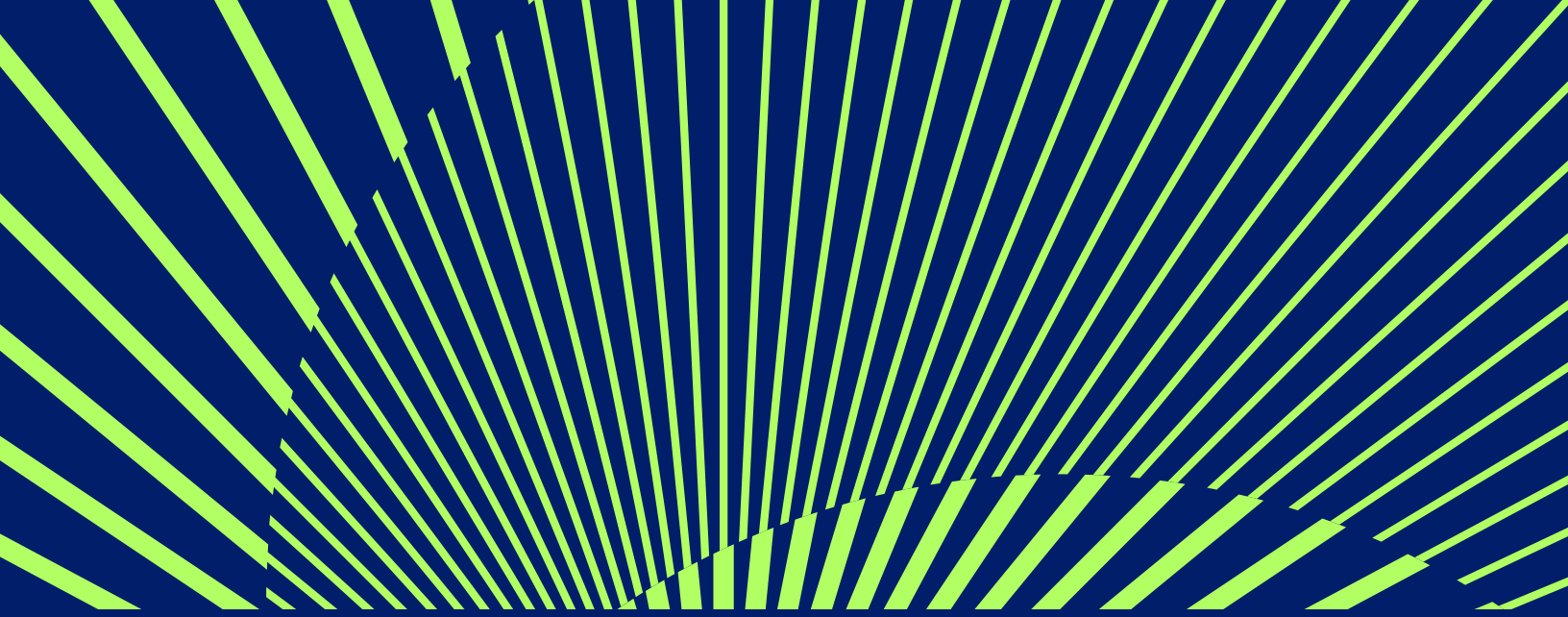
Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
20	Issuers conduct buybacks when prices are low	26	Ben-Rephael, A., Oded, J., & Wohl, A. (2014). Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Review of Finance*, 18(4), 1299-1340.	FN66, FN84	IV. EA
21	Buybacks improve stock liquidity	50	Busch, P., & Obernberger, S. (2017). Actual share repurchases, price efficiency, and the information content of stock prices. *Review of Financial Studies*, 30(1), 324-362.	FN79, FN81, FN85, FN98	IV. EA
21	Buybacks improve stock liquidity	28	Cook, D. O., Krigman, L., & Leach, J. C. (2004). On the timing and execution of open market repurchases. *Review of Financial Studies*, 17(2), 463-498.	FN66, FN85	IV. EA
21	Buybacks improve stock liquidity	64	Hillert, A., Maug, E., & Obernberger, S. (2016). Stock repurchases and liquidity. *Journal of Financial Economics*, 119(1), 186-209.	FN85	IV. EA
22	SEC regulations attenuate buyback behavior	6	Bonaimé, A. A. (2015). Mandatory disclosure and firm behavior: Evidence from share repurchases. *The Accounting Review*, 90(4), 1333-1362.	FN27, FN79, FN86, FN87, FN99	II. Proposed Amendments; IV. EA
23	Liquidity declines around buybacks	65	Ginglinger, E., & Hamon, J. (2007). Actual share repurchases, timing and liquidity. *Journal of Banking & Finance*, 31(3), 915-938.	FN89	IV. EA
23	Liquidity declines around buybacks	66	Brockman, P., & Chung, D. Y. (2001). Managerial timing and corporate liquidity: Evidence from actual share repurchases. *Journal of Financial Economics*, 61(3), 417-448.	FN89	IV. EA
24	Buybacks correct market undervaluation	67	Zhang, H. (2005). Share price performance following actual share repurchases. *Journal of Banking & Finance*, 29(7), 1887-1901.	FN90	IV. EA
24	Buybacks correct market undervaluation	68	Drousia, A., Episcopos, A., & Leledakis, G. N. (2019). Market reaction to actual daily share repurchases in Greece. *Quarterly Review of Economics and Finance*, 74, 267-277.	FN90	IV. EA
24	Buybacks correct market undervaluation	69	Bratli, D., & Rehman, O. (2015). The price impact and timing of actual share repurchases in Norway (Master's thesis).	FN90	IV. EA
25	Disclosing buyback rationale correlates with completion rates	51	Bonaimé, A. A. (2012). Repurchases, reputation, and returns. *Journal of Financial and Quantitative Analysis,* 47(2), 469-491.	FN79, FN95	IV. EA
26	Benefits of disclosing buyback rationale may or may not be limited due by boilerplate	70	Cazier, R. A., McMullin, J. L., & Treu, J. S. (2021). Are lengthy and boilerplate risk factor disclosures inadequate? An examination of judicial and regulatory assessments of risk factor language. *The Accounting Review*, 96(4), 131-155.	FN96	IV. EA
26	Benefits of disclosing buyback rationale may or may not be limited due by boilerplate	71	Nelson, K. K., & Pritchard, A. C. (2016). Carrot or stick? The shift from voluntary to mandatory disclosure of risk factors. *Journal of Empirical Legal Studies*, 13(2), 266-297.	FN96	IV. EA

Topic #	Citation Topic in Proposal	Study #	Study	Location (Footnote, or FN)	Section
26	Benefits of disclosing buyback rationale may or may not be limited due by boilerplate	72	Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H. M., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies,* 19(1), 396-455.	FN96	IV. EA
27	Mandatory disclosures affect issuer behavior	73	Chuk, E. C. (2013). Economic consequences of mandated accounting disclosures: Evidence from pension accounting standards. *The Accounting Review*, 88(2), 395-427.	FN99	IV. EA
27	Mandatory disclosures affect issuer behavior	6	Bonaimé, A. A. (2015). Mandatory disclosure and firm behavior: Evidence from share repurchases. *The Accounting Review*, 90(4), 1333-1362.	FN27, FN79, FN86, FN87, FN99	II. Proposed Amendments; IV. EA
28	Decreases in information asymmetry lowers the cost of capital	74	Easley, D., & O'Hara, M. (2004). Information and the cost of capital. *Journal of Finance,* 59(4), 1553-1583.	FN100	IV. EA
28	Decreases in information asymmetry lowers the cost of capital	75	Botosan, C. A. (2006). Disclosure and the cost of capital: What do we know? *Accounting and Business Research*, 36(Sup1), 31-40.	FN100	IV. EA
28	Decreases in information asymmetry lowers the cost of capital	76	Lambert, R., Leuz, C., & Verrecchia, R. E. (2007). Accounting information, disclosure, and the cost of capital. *Journal of Accounting Research*, 45(2), 385-420.	FN100	IV. EA
29	Price impact could be disproportionate for small issuers	77	Amihud, Y., & Mendelson, H. (1986). Liquidity and stock returns. *Financial Analysts Journal,* 42(3), 43-48.	FN105	IV. EA
29	Price impact could be disproportionate for small issuers	78	Duarte, J., & Young, L. (2009). Why is PIN priced? *Journal of Financial Economics*, 91(2), 119-138.	FN105	IV. EA
30	Disproportionate impact on small issuers offset by less frequent repurchases	79	Dittmar, A. K. (2000). Why do firms repurchase stock? *Journal of Business,* 73(3), 331-355.	FN106	IV. EA
30	Disproportionate impact on small issuers offset by less frequent repurchases	54	Cheng, Y., Harford, J., & Zhang, T. T. (2015). Bonus-driven repurchases. *Journal of Financial and Quantitative Analysis*, 50(3), 447-475.	FN80, FN106	IV. EA
30	Disproportionate impact on small issuers offset by less frequent repurchases	80	Jiang, Z., Kim, K. A., Lie, E., & Yang, S. (2013). Share repurchases, catering, and dividend substitution. *Journal of Corporate Finance*, 21, 36-50.	FN106	IV. EA

V. Appendix B. Studies Not Cited in Proposal

Topic #	Topic in Comment Letter	Study #	Omitted Study	Section
1	Insider selling around repurchases	1	Dittmann, I., Li, A. Y., Obernberger, S., & Zheng, J. (2022). The impact of the corporate calendar on the timing of share repurchases and equity grants. Available at SSRN 4004098.	I.A.
2	Buybacks to boost executive pay	2	Fields, R.,(2016). ***Buybacks and the board: Director perspectives on the share repurchase revolution.*** Investor Responsibility Research Center Institute (IRRC) Institute/Tapestry Network.	I.B.
2	Buybacks to boost executive pay	3	PriceWaterhouseCoopers. (2019, July). ***Share repurchases, executive pay and investment.*** Report to Department for Business, Energy & Industrial Strategy, BEIS Research Paper 2019/011.	I.B.
2	Buybacks to boost executive pay	4	Bargeron, L., Kulchania, M., & Thomas, S. (2011). Accelerated share repurchases. ***Journal of Financial Economics,*** 101(1), 69-89.	I.B.
2	Buybacks to boost executive pay	5	Bennett, B., Bettis, J. C., Gopalan, R., & Milbourn, T. (2017). Compensation goals and firm performance. ***Journal of Financial Economics***, 124(2), 307-330	I.B.
2	Buybacks to boost executive pay	6	Bens, D. A., Nagar, V., Skinner, D. J., & Wong, M. F. (2003). Employee stock options, EPS dilution, and stock repurchases. ***Journal of Accounting and Economics***, 36(1-3), 51-90.	I.B.
3	Buybacks, investment, and employees	7	Fried, J., & Wang, C.C.Y. (2019, March 13). Democratic senators and the buyback boogeyman. ***Harvard Law School Forum on Corporate Governance***.	I.C.
3	Buybacks, investment, and employees	8	Lazonick, W. (2014, September). Profits without prosperity. ***Harvard Business Review***, 46-55.	I.C.
3	Buybacks, investment, and employees	9	Fried, J. M., & Wang, C. C. (2018). Are buybacks really shortchanging investment? ***Harvard Business Review***, 96(2), 88-95.	I.C.
3	Buybacks, investment, and employees	10	Fried, J. M., & Wang, C. C. (2019). Short-termism and capital flows. ***Review of Corporate Finance Studies***, 8(1), 207-233.	I.C.
3	Buybacks, investment, and employees	11	Fried, J. M., & Wang, C. C. (2021). Short-termism, shareholder payouts and investment in the EU. ***European Financial Management***, 27(3), 389-413.	I.C.
3	Buybacks, investment, and employees	12	Asness, C., Hazelkorn, T., & Richardson, S. (2018). Buyback derangement syndrome. ***Journal of Portfolio Management,*** 44(5), 50-57.	I.C.
3	Buybacks, investment, and employees	13	Edmans, A. (2017, September 15). The case for stock buybacks. ***Harvard Business Review***.	I.C.
3	Buybacks, investment, and employees	14	Edmans, A. (2020). ***Grow the pie: How great companies deliver both purpose and profit.*** Cambridge University Press.	I.C.
3	Buybacks, investment, and employees	15	Lewis, C. M. (2019). ***The economics of share repurchase programs***. Report commissioned by the Association of Mature American Citizens.	I.C.
4	Buybacks and information asymmetry	16	Grossman, S. J., & Stiglitz, J. E. (1980). On the Impossibility of Informationally Efficient Markets. ***American Economic Review***, 70(3), 393–408.	II

Topic #	Topic in Comment Letter	Study #	Omitted Study	Section
4	Buybacks and information asymmetry	17	Balakrishnan, K., Billings, M. B., Kelly, B., & Ljungqvist, A. (2014). Shaping liquidity: On the causal effects of voluntary disclosure. *Journal of Finance*, 69(5), 2237-2278	II
4	Buybacks and information asymmetry	18	Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, 5(1), 31-56	II
4	Buybacks and information asymmetry	19	Boone, A. L., Schumann-Foster, K., & White, J. T. (2021). Ongoing SEC disclosures by foreign firms. *The Accounting Review*, 96(3), 91-120.	II
4	Buybacks and information asymmetry	20	Lewis, C. M., & White, J.T. (2021). Corporate liquidity provision and share repurchase programs. U.S. Chamber of Commerce: Center for Capital Markets Competitiveness, Fall 2021.	II
4	Buybacks and information asymmetry	21	Core, J. E. (2001). A review of the empirical disclosure literature: Discussion. *Journal of Accounting and Economics*, 31(1-3), 441-456.	II
4	Buybacks and information asymmetry	22	Bushee, B. J., & Noe, C. F. (2000). Corporate disclosure practices, institutional investors, and stock return volatility. *Journal of Accounting Research*, 38, 171-202	II



U.S. Chamber of Commerce
Center for Capital Markets
Competitiveness

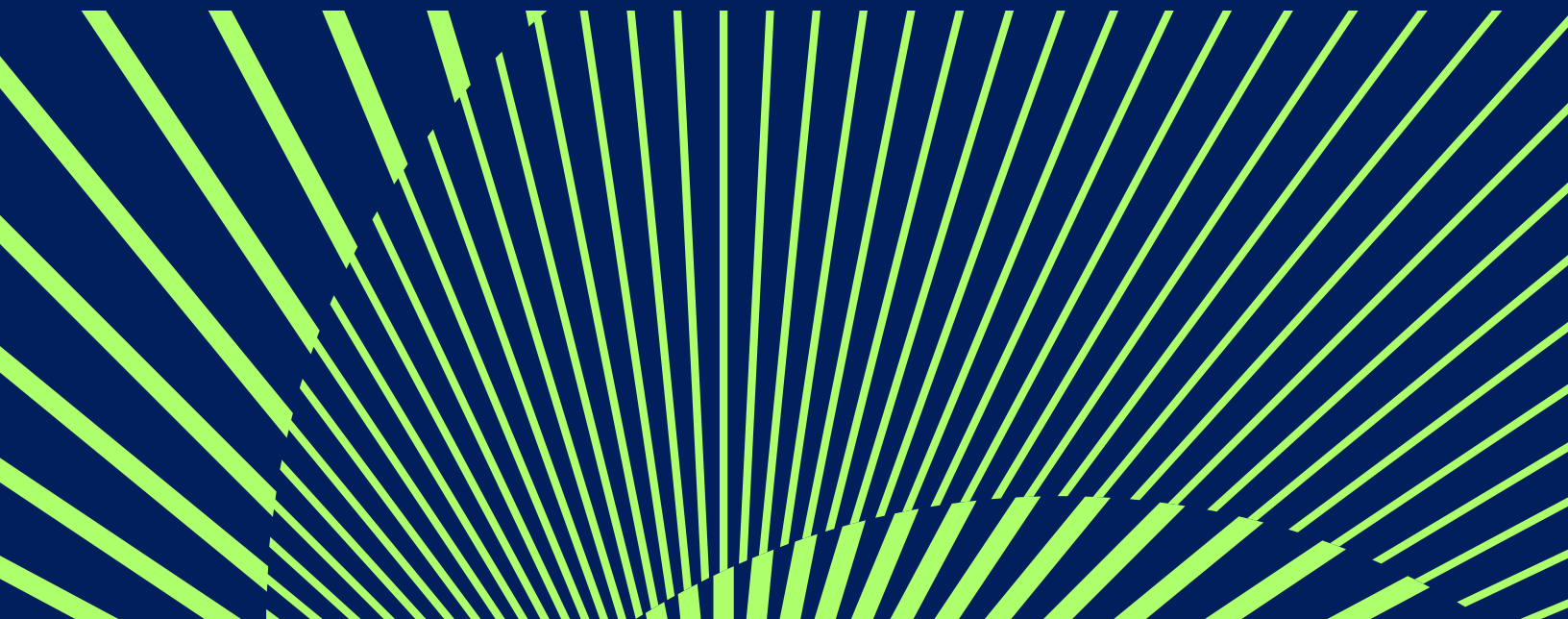
U.S. Chamber of Commerce
Center for Capital Markets
Competitiveness

Fall 2021 Report

Corporate Liquidity Provision &

Share Repurchase Programs

By: Craig M. Lewis & Joshua T. White



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Executive Summary

Corporations use stock buybacks as a means to unlock value by returning surplus cash to investors. In turn, these investors can deploy the capital to more productive uses.

The popularity of stock buyback programs has attracted significant attention from academics, policymakers, and practitioners. Some vocal opponents conjecture that stock buybacks necessarily reduce investment and harm non-investor stakeholders such as employees. Although a large body of academic literature overwhelmingly refutes these claims, such vocal criticisms persist and have led some to calls for limits via taxing stock buybacks or outright bans on open market repurchases.

In this study, we present large sample evidence showing that stock buybacks have a beneficial but often overlooked effect on stock price stabilization. Using a broad sample of over 10,000 U.S.-listed companies across a 17-year sample period of 2004 to 2020, we present strong evidence that managers strategically utilize share repurchases to increase stock liquidity and reduce volatility. The resulting stabilization in stock prices benefits all investors—including retail investors, who now account for over 20% of trading volume in U.S. equities.

Our analyses of stock buybacks have six key takeaways:

1. Greater liquidity: Companies repurchasing stock provides substantial liquidity that facilitates orderly trading and reduces transaction costs for retail investors.
2. Reduced volatility: Stock buybacks significantly reduce realized and anticipated return volatility. Imposing limitations on buyback activity would increase stock market volatility and force retail investors to bear greater amounts of downside risk.
3. Retail investors benefit: Stock buybacks generate an economically large benefit for retail investors. Since 2004, buybacks have saved retail investors $2.1–4.2 billion in transaction and price impact costs.
4. Proactive repurchase activity: Managers utilize market-based estimates of future volatility to inform their buyback decisions. When volatility is expected to be higher, managers increase their buyback intensity to stabilize stock prices, thus reducing costs for retail investors.
5. Response to uncertainty: Studies show that economic policy uncertainty increases stock price volatility and illiquidity. Managers respond to elevated policy uncertainty by strengthening their buyback activities. Retail investors benefit from price certainty about the value of their investments during periods of greater uncertainty.
6. Strategic liquidity supplier: Managers expand stock buyback activity during critical periods when investors sell relatively large amounts of shares. Thus, managers use buybacks to actively mitigate price pressure during periods of net selling pressure.

Overall, our analyses demonstrate the beneficial impact of stock buybacks on stock liquidity and volatility. To appreciate the market stabilization benefit of buybacks, it is important to understand what stock liquidity and volatility represent. A stock is considered to be liquid if buyers and sellers can transact quickly with low price impact. Highly liquid stocks also have more stable prices and thus lower stock price volatility. Our study shows that stock buybacks enhance liquidity and lower volatility. This allows all investors—institutional and retail—to buy and sell without having a large price impact.

Stock liquidity is especially beneficial to investors during periods of greater uncertainty when, for example, some institutional investors (e.g., index funds) must transact in stocks due to fund flows in and out of their portfolio. Retail investors also benefit from more stable stock prices as it allows them to sell stocks closer to the intrinsic value even during periods of higher uncertainty. By providing price support during periods when selling pressure is relatively high, buybacks benefit investors by reducing the downside risk of their investment.

Much of the rhetoric that surrounds the current debate on stock buybacks focuses on perceived advantages conferred to wealthy shareholders. For example, U.S. Sen. Sherrod Brown, the current chair of the Senate Committee on Banking, Housing and Urban Affairs, recently commented, "Today, much of that capital is funneled back to wealthy executives in the form of stock buybacks—which used to be illegal market manipulation—and only about 15 percent goes to the real economy."[1]

Contrary to the "political" view that share repurchase programs are self-serving mechanisms for inflating executive compensation, the evidence introduced by our study overwhelmingly supports the notion that managers use stock buybacks as a market stabilizing force, especially during uncertain and volatile periods. Price stabilization is a benefit that is conferred to all shareholders, including retail investors, regardless of whether they buy and sell stock in their own accounts or participate indirectly through investment in retirement accounts. We quantify the liquidity and volatility benefits of buybacks and estimate that retail investors save $2.1–4.3 billion during our full sample period. These benefits equate to $126–253 million in retail investor savings per year.

Therefore, our results have important policy implications for the contemporaneous discussions on buyback activity. Based on our findings, imposing any limitations or taxes on corporate share repurchases will curb managers' ability to supply liquidity and reduce volatility during crucial periods of uncertainty, which would ultimately harm retail investors by forcing them to incur additional transaction costs and bear greater downside risk.

1. See "Brown, Wyden unveil major new legislation to tax stock buybacks," September 10, 2021, available at https://www.brown.senate.gov/newsroom/press/release/brown-wyden-tax-stock-buybacks. Sen. Brown's comment ignores the fact that the funds directed to stock buybacks are reallocated within the economy, likely to companies that are better able to put the money to use in profitable opportunities that create even more jobs (see, e.g., Fried and Wang, 2018).

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1. Introduction

Corporate payouts attract significant interest from investors, lawmakers, and academics.[2] A debate continues to surround a specific type of payout: share repurchase programs. Proponents argue that the distribution of excess cash reserves creates incentives for managers to make efficient capital investments; signals undervalued share prices; allows investors to liquidate equity positions in a tax-efficient manner; and redirects aggregate investment capital to young, growing companies with valuable investment opportunities that should ultimately lead to job creation. By contrast, opponents argue that share repurchase plans cause artificial price inflation, lead to inadequate future investment, are an artifact of managerial short-termism, and disproportionately benefit wealthy investors and corporate insiders at the expense of employees.

This study examines the *price stabilization* role of share repurchase programs. The possibility that companies can strategically reduce volatility or provide liquidity during uncertain periods has received limited attention in the contemporaneous debate on repurchases. However, some in the media conjecture that a widespread pause in stock buyback activity can lead to market volatility.[3]

Several academic papers examine the link between stock buybacks and liquidity, but often focus on the liquidity role of market-makers rather than corporations during repurchasing events. Empirical findings on this relation are dated and mixed. For example, a number of studies report a negative relation between stock repurchases and liquidity as evidenced by widening bid-ask spreads following a share repurchase announcement (e.g., Barclay and Smith, 1988; Brockman and Chung, 2001). These papers argue that market-makers demand compensation for transacting against potentially informed insiders during repurchase programs, which results in widening spreads. A second set of studies employs varying sample sizes, research designs, and sample periods, and reports small or no relation between buyback announcements and bid-ask spreads (e.g., Singh et al., 1994, Wiggins, 1994; Miller and McConnell, 1995; Franz et al., 1995).

In contrast to these findings, two studies focusing on the liquidity role of corporations through buybacks provide suggestive evidence that share repurchases can have a *beneficial* impact on stock liquidity. Cook et al. (2004) examine a sample of 64 firms that provide daily repurchase data and find some improvements in bid-ask spreads and attenuations in the price impact of order imbalances. They argue that by supplying liquidity during times when there is net selling pressure, managers can actively mitigate the price impact. Hillert et al. (2016) find similar results using a large sample of buyback activities between 2004 and 2010.

2. Throughout this study we use the terms "buybacks," "stock buybacks," "repurchases," and "share repurchases" interchangeably to describe the corporate payout policy decision to repurchase equity from existing shareholders.
3. See, e.g., Erik Sherman, "Stock buybacks drop may mean more market volatility," *Fortune*, July 3, 2019, available at https://fortune.com/2019/07/03/share-buybacks-slowdown/.

Motivated by the mixed findings and small or dated samples in existing studies, we revisit the relation between stock buybacks, liquidity, and volatility using a large sample of over 10,000 U.S.-listed firms over the 17-year period 2004 to 2020.[4] Our sample period encompasses significant changes in technology, market microstructure, and the ownership structure of U.S.-listed firms via the rise in passive indexers and retail traders. Thus, we compute a wide range of variables intended to capture multiple dimensions of buyback activities, liquidity, and volatility. We also use an econometric technique to adjust our estimates for other factors that could influence these outcomes.[5]

By announcing the initiation of a share repurchase program, a firm effectively notifies investors that it plans to open a window when investors can be reasonably confident that they can liquidate positions without being unduly concerned about negative price impact. Similar to Benveniste et al. (1996), we argue that share repurchase programs implicitly provide liquidating shareholders with a put option that allows them to sell at the current market price.[6] The benefit derived from corporate liquidity provision is similar to underwriter efforts to stabilize prices of newly listed firms immediately following initial public offerings (IPOs).[7] The main difference is that the firms purchase the shares in a stock buyback rather than the underwriter in an IPO. In both cases, the entity purchasing shares can strategically decide when to enter the market. The marginal benefit of this action should be larger during periods of elevated uncertainty and when downward price pressure is the strongest.

Based on these arguments, our main prediction is that managers will repurchase shares when trading is characterized by a period of illiquidity and that strategic repurchasing will reduce stock market volatility all else equal. By limiting downside risk, buyback-induced reductions in volatility are especially beneficial to retail investors. Similarly, greater stock liquidity reduces transaction costs of investing, which benefits all shareholders, especially retail traders who tend to transact more frequently (Odean, 1999; Barber and Odean, 2000; Eaton et al., 2021).

We perform a regression analysis on several liquidity proxies and find that, as predicted, managers actively repurchase shares during periods when selling pressure is relatively high. When firms repurchase shares, their actions improve liquidity, thereby reducing transaction costs. We also find that these effects are an increasing function of buyback intensity (percentage of shares repurchased relative to shares outstanding). All of these findings are consistent with our hypothesis that share repurchase programs provide liquidity.

We next consider the impact on stock price volatility. We use three measures of volatility: historical volatility, implied volatility, and abnormal return volatility. The latter measure focuses on firm-specific

4. We start our sample in the first quarter of 2004 (1Q04) because the U.S. Securities and Exchange Commission (SEC) began requiring reporting issuers to provide quarterly disclosure of all share repurchases for issuers with fiscal periods ending on or after March 15, 2004. See SEC, Purchases of Certain Equity Securities by the Issuer and Others, Final Rule, November 10, 2003, available at https://www.sec.gov/rules/final/33-8335.htm.
5. Our regression models include standard control variables used in tests of liquidity and volatility, calendar-quarter fixed effects to control for time-varying factors that could influence liquidity and volatility; and industry fixed effects to control for time-invariant factors that could impact these outcomes.
6. Benveniste et al. (1996) argue that underwriter price stabilization following an initial public offering provides institutional investors with a put option as implicit compensation for revealing private information during the pre-offer period.
7. Lewellen (2006) documents that there is a substantial amount of price support in the IPO market.

risk by netting out the volatility of the overall market. We show that, regardless of the volatility metric, stock return volatility tends to be lower during periods when managers are actively repurchasing shares. Moreover, the magnitude of the volatility reduction is larger when the company repurchases a greater percentage of shares. These findings are consistent with the prediction that strategically timed share repurchases effectively provide price support by reducing the risk of stock price declines. This result does not, however, imply that repurchase programs prevent stock prices from reaching their fundamental values. Instead, it suggests that buybacks limit liquidity-induced losses and reduce transaction costs for investors.

We also provide estimates of the economic benefits to retail investors due to repurchase activity. Studies and news articles show that retail investors account for a growing portion of stock market activity in the U.S. Estimates of retail investor trading volume range from 10% to 14% before commission free trading was introduced, and more than 20% by the end of our sample period. We estimate net savings of $2.1–4.2 billion during our sample period, most of which stems from reduced stock price volatility.

We also consider whether managers are more likely to repurchase shares during periods when near-term volatility is expected to be high relative to longer-term volatility forecasts. Using the implied volatility of short- and medium-term stock options, we predict and find that managers tend to engage in more buyback activities and strengthen the intensity of their repurchases when short-term implied volatility is relatively higher than long-term implied volatility.

We then examine periods of high political uncertainty, which prior work links to deteriorations in overall market quality and liquidity (Pasquariello and Zafeiridou, 2014). We find that when political uncertainty is high, firms with existing buyback programs are more likely to repurchase shares. We also show that firms are less likely to initiate a new buyback program during this period, perhaps due to the uncertainty of future tax or governmental policies. A graphical examination of the time series of buybacks shows that firms tend to increase the intensity of share repurchase activity just before a U.S. presidential election period. This finding is also consistent with managers using share repurchases to provide liquidity during uncertain times.

Finally, we test a “liquidity windows hypothesis” by examining whether managers alter repurchase activity during periods when institutional investors are selling more shares. We hypothesize and find that managers tend to strengthen repurchase activities when institutional selling is high. We interpret this finding as evidence that managers supply liquidity to markets by attenuating volatility pressures due to institutional selling.

Taken together, we provide substantial evidence that managers strategically use share repurchase programs to stabilize stock price and provide liquidity during periods of uncertainty. These activities mitigate share price declines and benefit the firm’s investors by reducing transaction costs and reducing downside liquidity risk. Thus, our study provides timely evidence that should be considered in the contemporaneous debate on stock

buyback activity. Based on our findings, any imposition of limits on stock buyback activity would reduce stock liquidity, elevate return volatility, and introduce risk that ultimately harms the company's investor base, which includes a substantial and growing portion of retail investors.

The rest of the paper is organized as follows: Section 2 discusses the economics of buybacks and the contemporaneous debate surrounding stock buybacks, and reviews the relevant literature. Section 3 describes the data and the metrics used in our analysis. Section 4 discusses our main results. Section 5 offers additional analyses. We conclude in Section 6.

2. Background Information

A. The Economics of Buybacks

Stock buybacks are corporate payout policy decisions designed to return excess cash to shareholders. A firm that follows an optimal investment policy will first allocate capital to new and existing investments that increase firm value. Once a company invests in all projects that have a positive net present value, it will consider whether it should return any surplus cash to shareholders since further investment would likely reduce firm value. In other words, value would be reduced if firms continued to invest by directing capital to projects that earn less than the opportunity cost of capital. Rather than make value-destroying investments, firms can return surplus cash to shareholders that can then use the returned capital to invest in other companies that need to raise additional cash for investment opportunities that are value increasing.[8] By allowing surplus cash to find a better use, economy-wide corporate investment is more efficiently allocated.

Share Repurchase Regulation

Prior to 1982, companies conducting open market share repurchases were subject to potential stock price manipulation penalties under Sections 9(a)(2) and 10(b) of the Securities Exchange Act of 1934 (Exchange Act). During this period, firms were effectively forced to rely on ordinary or special dividends to return surplus cash to shareholders. Since ordinary dividends are taxed as ordinary income, it results in the double taxation of corporate income since the distributed cash was generated by earnings that were already taxed at the corporate level.

Under Rule 10b-18, which the SEC adopted in 1982 and updated in 2003, firms can receive a safe harbor from liability for manipulation based solely on the timing or price of repurchases.[9] Importantly, managers can still violate the anti-fraud and anti-manipulation provisions of the Exchange Act if they, for example, engage in repurchases while in possession of material, nonpublic information that could impact the company's stock price. Thus, most share repurchases actively seek this safe harbor by following a standard process.[10]

Share Repurchase Mechanics

Before engaging in buybacks, the board of directors must explicitly authorize and approve a formal share repurchase program. The firm then publicly discloses the repurchase program prior to its

8. It is important to note that the buyback cash paid to shareholders does not necessarily exit capital markets or the economy. Investors that tender their shares during the share repurchase program can reinvest the cash received at other companies or spend it to consume goods and services. Thus, share repurchases can have a reallocation effect by allocating capital to a more efficient use.
9. See SEC, Purchases of Certain Equity Securities by the Issuer and Others, Final Rule, November 10, 2003, available at https://www.sec.gov/rules/final/33-8335.htm.
10. The SEC's Division of Trading and Markets provides a set of questions and answers to assist companies in meeting the voluntary safe harbor from liability for manipulation under Rule 10b-18. See SEC, "Division of Trading and Markets: Answers to frequently asked questions concerning Rule 10b-18 ('Safe Harbor' for Issuer Repurchases)," modified December 2, 2016, available at https://www.sec.gov/divisions/marketreg/r10b18faq0504.htm.

commencement. This disclosure informs market participants on the timing, size, objective, and method of repurchase. Although this disclosure is not a firm commitment to repurchase shares, the market response to repurchase announcements has historically been positive, indicating that investors approve of the board's decision and view the disclosure as a credible non-binding commitment (see, e.g., Ikenberry et al., 1995; Oded, 2005; Bargeron et al., 2011). Over the course of an active repurchase program, firms are required to periodically report the actual shares repurchased on SEC Forms 10-Q and 10-K (and 20-F for foreign private issuers).[11]

There are several methods for repurchasing shares. The most common approach is called an open market repurchase (OMR) program, where the firm buys back its shares over a period that can last several months or multiple years. Academic studies (e.g., Oded, 2005; Farre-Mensa et al., 2014) have shown that OMRs constitute as much as 90% of the dollar volume of all announced repurchases. An advantage of an OMR is that a firm can determine how many shares to repurchase as a function of changing market conditions (Stephens and Weisbach, 1998; Cook et al., 2004).

Companies also employ structural buyback programs with features designed to achieve specific objectives. One example is an accelerated share repurchase (ASR) program. A firm that employs an ASR retains an investment bank to collect a large position in the firm's common stock for which the firm pays a fixed as opposed to uncertain price to repurchase. In effect, an ASR functions much like a reverse equity issuance. In some cases, the cash used to execute an ASR comes from the issuance of new debt, which substantively increases the relative amount of debt in the firm's capital structure. ASR programs, however, are less flexible than OMR programs as managers have less flexibility to alter ASR terms once this type of repurchase program is announced (Bargeron et al., 2011). Other less frequently employed forms of repurchases include privately negotiated repurchases (Peyer and Vermaelen, 2005) and tender offers through a Dutch auction (Comment and Jarrell, 1991) or at a fixed price (Masulis, 1980).

Motivations for Repurchasing Stock

Firms engage in stock buybacks for a number of reasons. As noted above, share repurchases are a mechanism for distributing surplus cash, which is the amount of cash left over after funding new investment opportunities. By returning surplus cash to investors, managers can attenuate the temptation to invest in negative net present value projects (i.e., projects that earn less than the opportunity cost of capital) that sub-optimally grow the size of the firm's assets.

Prior to the SEC's safe harbor for share repurchases, there was considerable evidence that some managers would use surplus cash for projects or acquisitions that increased the size of assets under their control. These actions generated managerial prestige and boosted compensation, thereby destroying firm value (Jensen, 1986).

11. In contrast to quarterly reporting of buyback activity by the firm, its insiders—defined as top executives, directors, and 10% owners—must report buys and sales within two business days after the transaction under Section 16(a) of the Securities Exchange Act of 1934. See SEC, "Exchange Act Section 16 and related rules and forms," modified August 11, 2010, available at https://www.sec.gov/divisions/corpfin/guidance/sec16interp.htm.

Repurchasing shares and paying dividends limits the resources under management control, thereby requiring firms to engage with capital market participants to fund new investment. Such engagement can create value by adding another layer of monitoring on corporate investment decisions. There also is strong evidence that investors negatively view surplus cash left on the balance sheet rather than being returned via payouts. For example, Dittmar and Mahrt-Smith (2007) show that the market value of $1.00 on the balance sheet of a poorly governed firm is worth less than $1.00. Taken together, academic evidence shows that payout surplus cash via dividends and stock buybacks is a way to unlock value.

In comparison to dividends, share repurchases have a number of additional advantages. First, share repurchases can be a more *tax-efficient* method for returning surplus cash. Consider a dividend paid to all investors simultaneously. Tax laws typically treat the dividend as ordinary income and, thus, paying a dividend triggers potential tax obligations for all investors. In the case of a share repurchase, selling shareholders will be subject to capital gains taxes. If the capital gains tax rate is lower than the ordinary income tax rate, these investors will realize a higher after-tax rate of return on their investment. Moreover, only those investors that tender shares trigger tax obligations since shareholders that do not sell defer tax obligations to a future sale date. Yet, non-selling shareholders still benefit from any corresponding increase in the stock price. On net, share repurchases allow shareholders to determine when they are exposed to personal taxes rather than imposing taxes on retail investors.

A second advantage of share repurchases is the *flexibility* for managers to adjust to changes in market conditions under an OMR program. Dividends carry the implied promise that the company will continue to pay the same or an increasing dividend. Indeed, academic evidence shows that dividend initiations are typically met with an increase in the stock price, which is often attributed to signaling confidence that future profitability will remain strong enough to pay additional dividends. For example, Kale et al. (2012) study a sample of firms initiating their first dividend after an IPO and find a 1.7% positive abnormal price response. However, dividend cuts are typically met with a strongly negative market response. For instance, Henry et al. (2017) find an average −6% stock price decline around the announcement of dividend reduction for a sample of firms during 1997 to 2015.

Several studies find a positive market response to the announcement of share repurchases, which is frequently attributed to signaling undervalued stock prices and a reduction in agency costs by reducing surplus cash (e.g., Ikenberry et al., 1995; Oded, 2005; Bargeron et al., 2011). Bargeron et al. (2020) also show that the suspension of a previously announced open market repurchase program is met with a negative stock price response, but the magnitude of the response is smaller than the response associated with dividend cuts. For example, Bargeron et al. (2020) report a −1.35% abnormal return to disclosing repurchase suspensions over 1984 to 2010, which is substantially less negative than the −6% stock price decline to dividend cuts reported in Henry et al. (2017).

Consistent with repurchases being more flexible than dividends, Stephens and Weisbach (1998) find that "quarterly repurchases are positively related to both the expected and surprise components of the firm's quarterly cash flows, suggesting that managers adjust their stock repurchases for unexpected changes in the firm's cash position." They note that such adjustments would not be possible if managers had to pre-commit to specific amounts or timing in repurchases.

Firms also repurchase shares to adjust their capital structure. For firms that grant stock or issue options to employees, share repurchases help offset the dilutive impact of equity compensation. Similarly, a firm that issues stock to fund an acquisition might wish to repurchase those shares over time to achieve a target capital structure. Firms might also repurchase shares as part of a large change in their capital structure, such as the issuance of debt to repurchases shares, which is known as a leveraged buyback. When companies have slowing growth and unused debt capacity, a leveraged buyback allows firms to optimize their capital structure and avail themselves to valuable tax benefits of debt financing. Prior work (e.g., Lei and Zhang, 2016) shows that leveraged buybacks are met with both positive announcement and long-term stock returns, likely due to the dual governance effect of reducing surplus cash and additional monitoring by creditors. Thus, repurchases can be value-enhancing by reducing agency costs of equity.

B. Contemporaneous Debate on Buybacks

Opponents of Stock Buybacks

The popularity of share repurchase programs attracts its share of critics. Some claim that buybacks sacrifice long-term value creation that harms non-investor stakeholders. For example, Lazonick (2014) argues that share repurchases erode employee income gains, harm employment levels, limit corporate investment, and contribute to a wealth gap between investors and other Americans. Lazonick points to a statistic that, over 2003 to 2012, companies in the Standard and Poor's S&P500 index used 54% of earnings to buy back stock and 37% to pay dividends. Lazonick (2014) notes that these high payout rates leave only 9% to invest in the future growth of companies. Similar criticisms were lodged by Lazonick et al. (2020) and echoed by prominent investors such as BlackRock's Chairman and CEO Laurence Fink in a letter to S&P500 CEOs in 2014.[12]

In response to these concerns, U.S. Sens. Chuck Schumer and Bernie Sanders penned an opinion article for the *New York Times* in February 2019.[13] They cite the same 90% payout statistic as Lazonick (2014) and assert that managers overly focus on shareholder value rather than worker productivity or corporate resiliency. These senators argue that share repurchases are bad for U.S. workers and the long-term strength of the economy. Moreover, they claim that share repurchases constrain

12. In a letter to S&P500 CEOs, Fink states, "Too many companies have cut capital expenditures and even increased debt to boost dividends and share buybacks. We certainly believe that returning cash to shareholders should be part of a balanced capital strategy; however, when done for the wrong reasons and at the expense of capital investment, it can jeopardize a company's ability to generate sustainable long-term returns." See "Text of letter sent by Larry Fink, BlackRock's Chairman and CEO, encouraging a focus on long-term growth strategies," *Wall Street Journal*, March 21, 2014, available at https://online.wsj.com/public/resources/documents/blackrockletter.pdf.
13. See Schumer and Sanders, "Limit corporate stock buybacks," *New York Times*, February 3, 2019, available at https://www.nytimes.com/2019/02/03/opinion/chuck-schumer-bernie-sanders.html.

company investment in research and development (R&D) and reduce firms' ability to pay their workers higher wages. In the article, the senators threaten to introduce legislation that would limit share repurchase activity by modifying the corporate tax code. In July 2019, U.S. Sen. Sherrod Brown introduced legislation seeking to curb stock buybacks by repealing the safe harbor under Rule 10b-18 and creating a "worker dividend" equal to $1 for every $1 million invested in stock buybacks, dividend increases, and special dividends.[14] In September 2021, Sens. Brown and Ron Wyden unveiled a bill titled the Stock Buyback Accountability Act that proposes a 2% excise tax on the amount of stock buybacks.[15]

Criticisms of stock buyback activity also surfaced during the onset of the COVID-19 pandemic. For example, in March 2020, then presidential candidate Joe Biden called upon CEOs to commit to forgo stock repurchases for a full year under the pretext that CEOs should focus on their employees and their community.[16] Specific restrictions on stock buybacks and dividends were also included by Congress in the text of the economic stimulus and relief acts in 2020 and 2021 as well as recently proposed legislation focusing on infrastructure investment.[17]

Proponents of Stock Buybacks

Several academics have responded to criticisms of share repurchases by either highlighting logical flaws in the critiques of buybacks or noting overlooked aspects of corporate financial policies that call into question the premise that buybacks are the source of so many negative economic outcomes. We briefly summarize the rebuttal to the criticism of share repurchases below.

Fried and Wang (2018, 2019) argue that the "90% payout statistic" cited by Lazonick (2014) and U.S. Sens. Schumer and Sanders is misleading. They present empirical evidence that public companies recover about 80% of the cash distributed to shareholders by raising new equity. Thus, the net amounts of cash being returned to shareholders is less than half the amount claimed by buyback critics. Fried and Wang (2018, 2019) also argue that when critics cite the payout ratio—shareholder payouts as a percentage of net income—they fail to recognize that net income has already deducted R&D expenditures, which they estimate accounts for 25–30% of net income. They note that "net income at best is a measure of the amount available for capital expenditures (CAPEX) and additional R&D."

14. See Stock Buyback Reform and Worker Dividend Act of 2019, S.2391, 116th Cong. (2019), available at https://www.congress.gov/bill/.116th-congress/senate-bill/2391/text.
15. See "Brown, Wyden unveil major new legislation to tax stock buybacks," September 10, 2021, available at https://www.brown.senate.gov/newsroom/press/release/brown-wyden-tax-stock-buybacks. A copy of the bill is available at https://www.brown.senate.gov/imo/media/doc/stock_buy_back_accountability_act_bill_text.pdf.
16. See tweet by Joe Biden, "I am calling on every CEO in America to publicly commit now to not buying back their company's stock over the course of the next year. As workers face the physical and economic consequences of the coronavirus, our corporate leaders cannot cede responsibility for their employees. Every CEO in America should be focusing on workers, families, and communities—not executive compensation and share prices." March 20, 2020, available at https://twitter.com/JoeBiden/status/1240998489498288129.
17. The Coronavirus Aid, Relief, and Economic Security Act, which provided $2.2 trillion in economic stimulus, was signed into law on March 27, 2020. The legislation provides loans and loan guarantees to businesses with the restriction that, "[U]ntil the date 12 months after the date the loan or loan guarantee is no longer outstanding, the eligible business shall not pay dividends or make other capital distributions with respect to the common stock of the eligible business." See https://www.govinfo.gov/content/pkg/PLAW-116publ136/pdf/PLAW-116publ136.pdf. Similar restrictions were placed on contractors and air carriers in the $900 billion Consolidated Appropriations Act of 2021 (see https://www.govinfo.gov/content/pkg/BILLS-116hr133enr/pdf/BILLS-116hr133enr.pdf) and the $1.9 trillion American Rescue Plan of 2021 (see https://www.congress.gov/117/bills/hr1319/BILLS-117hr1319enr.pdf).

Fried and Wang (2018, 2019) highlight the flaw in viewing stock buybacks and investments as substitutes. Their evidence indicates that firms are able to make all of the investment in CAPEX and R&D that managers deem necessary and repurchase shares out of surplus cash from net income. Thus, buybacks do not shortchange investments in the company and its employees. Similarly, buybacks do not necessarily sacrifice investments in the community because investors in general tend to invest in local companies (see, e.g., Coval and Moskowitz, 1999). Therefore, it stands to reason that funds directed to stock buybacks are more likely to be reinvested locally.

Fried and Wang (2018, 2019) conclude that shareholder payouts are not wasted from an investment or innovation perspective. Moreover, buybacks and dividends do not constrain firms' ability to invest since shareholders supply investment capital by buying newly issued shares. They also argue that limiting repurchases for public companies would make it harder to return surplus capital to investors who can reinvest in young and growing private firms, which contribute substantially to employment growth. Moreover, they argue that buybacks do not meaningfully contribute to income inequality.

Asness at al. (2018) also push back on the notion that share repurchases are harmful. In their study, they characterize the political attacks on share repurchases as "buyback derangement syndrome." They first reject claims by critics that current levels of buyback activities are abnormally high. In their analysis, they demonstrate that, when properly measured, aggregate share repurchase activity is far below historically high levels. Moreover, when netting repurchases against debt issuance, they claim that share repurchases are essentially a "non-event" in terms of changes in capital structure. Asness et al. (2018) also argue that repurchases did not mechanically create earnings growth or stifle aggregate investment activity as critics often claim. They also contend that buybacks were not the primary cause of the stock market strength during the 2010s and that the "myths" of the buyback programs should be discarded.

Edmans (2017, 2020) systematically challenges critics' claims that companies are misappropriating corporate funds towards buybacks by reviewing several academic studies. He first points to empirical evidence showing that firms are not reducing investment at the expense of long-term value creation. In fact, he argues that this viewpoint "puts the cart before the horse" since firms first allocate money to investment based on investment opportunities that generate a return greater than the firms' cost of capital. Any remaining or "surplus" cash is then available to use for buybacks, which is supported by both empirical and survey evidence that repurchases are made out of residual cash flow after investment spending (Brav et al., 2005).

Edmans (2017, 2020) also points to studies showing that stock repurchases tend to occur when firms' growth opportunities are poor (Grullon and Michaely, 2002) or stock prices are low (Dittmar and Fields, 2015). He argues that buybacks do not necessarily weaken companies in the long term. For example, he points to studies showing that firms engaging in buybacks tend to outperform the market (Ikenberrry

et al., 1995). Edmans (2017, 2020) also confronts the premise behind the critique of buybacks that "more investment is better than less investment." He notes that a fundamental principle of finance is that value is created only if the returns from investment are higher than other projects that shareholders could invest in.

Edmans warns that restrictions on repurchases could harm the economy as it would incentivize companies to "empire build" by investing the capital to sub-optimally grow the size of the firm. Limiting or taxing buybacks would also damage the ability to efficiently reallocate money to young, smaller companies that fuel growth and employment (see, e.g., Fried and Wang, 2018). He also notes that repurchases increase the ownership percentages of insiders such as the CEO, which further aligns their stakes with shareholders.

Given that numerous academic studies refute the claims that buybacks are leading to short-termism that deprives public firms of investment capital and harms stakeholders, it is puzzling that the negative buyback rhetoric continues to persist as part of the political dialogue. In other words, how does one reconcile that some politicians continue to seek ways to limit buyback activity by pointing to claims of short-termism that are not backed up by the preponderance of scientific studies?

To shed light on this phenomenon, Roe and Shapira (2020) examine the power of narrative in corporate lawmaking. They note that "short-termism" is a powerful and persistent narrative of a seemingly dichotomous managerial choice of investing for the short versus long term, which is not true. This narrative argues that market forces encourage short-term actions such as buybacks that necessarily sacrifice long-term value creation and ultimately damage the economy. The narrative is powerful due to forces such as its connotation of good versus bad and psychological tendencies such as confirmation bias by those wishing to limit or tax corporate actions. Roe and Shapira (2020) warn that politicians can use the narrative of short-termism to push for limits on company actions that are not justified by the data, which will inevitably result in sub-optimal policymaking.

C. Buybacks, Liquidity, and Volatility

In this subsection, we review academic literature linking elements of buyback activity to stock liquidity or volatility.[18] Existing studies provide mixed evidence as to whether stock buybacks increase or decrease stock liquidity.

Theoretically, there are several reasons why share repurchase activity could impact liquidity. For example, one implication of the seminal theory on payout by Miller and Modigliani (1961) is that trading

18. Other prior work focuses on the liquidity of the company rather than the liquidity of its stock. For example, Stephens and Weisbach (1998) show that quarterly repurchase activity is positively related to the expected and surprise components of cash flows. This finding implies that managers adjust their repurchase activity when they experience unanticipated changes in their cash holdings (i.e., have fewer liquid assets to use for repurchases). Consistent with this notion, Bargeron et al. (2011) note that, in comparison to OMR buyback programs, ASR programs reduce the flexibility of managers to alter buybacks in response to unexpected shocks to cash flow. Moreover, they note that similar arguments apply to changes in stock price or liquidity after the buyback program is announced. The lack of flexibility is likely one reason that firms buy back greater amounts of stock through OMR rather than ASR programs. Manconi et al. (2019) examine buyback activity around the world and show that buybacks create long-term shareholder value, especially in countries with poor stock market liquidity. However, shareholder returns crucially depend on the liquidity of equity markets. They note that average stock liquidity is the only country-level characteristic that is robustly related to long-term abnormal stock returns, indicating that investors might underreact in the near-term to the positive information contained in buyback announcements.

frictions, such as liquidity costs, could impact firms' payout policy decisions. Similar to the role of underwriters in IPOs (see, e.g., Benveniste et al., 1996), share repurchase activity could contribute to price stabilization, thereby increasing liquidity and reducing volatility by allowing existing and large shareholders to sell at the current market price. However, Holden et al. (2014) note that repurchases could negatively impact liquidity by simply reducing the number of shares traded in the market.

Holden et al. (2014) note that repurchases could also influence liquidity indirectly if they alter the behavior of market-makers, who are key suppliers of market liquidity. This influence will depend on whether market-makers perceive repurchase activities as informed trading by corporate insiders. On the one hand, buybacks could reduce liquidity if market-makers demand compensation for transacting against informed insiders. In this case, market-makers could widen the spread to compensate for their opportunity cost of time and invested capital. On the other hand, share repurchases could induce competition amongst market-makers, who supply liquidity, thereby having a positive impact on liquidity.

Empirical evidence on the relation between buybacks and liquidity is mixed as existing studies document positive, negative, and negligible effects on liquidity. Cook et al. (2004) find a positive relation between buybacks and liquidity. They posit that firms can provide liquidity and lower their capital costs through OMR trades during periods of low trading volume or higher selling pressure. For example, they argue that firms can directly impact quoted bid-ask spreads by placing a limit order to buy shares if the price declines to a certain level. Cook et al. (2004) study buyback activity during 1993 and 1994 for a sample of 64 firms that respond to a questionnaire about buyback activities. Using intra-day trading data, they find that repurchases positively influence liquidity by narrowing bid-ask spreads and attenuating the price impact of order imbalances on days when repurchase trades are completed.

More recently, Hillert et al. (2016) also find a positive relation between share repurchases and liquidity using a sample of companies over 2004 to 2010. Using an instrumental variables approach, these authors report that stock buyback intensity reduces bid-ask spreads and other measures of stock illiquidity. Moreover, they find that firms use buybacks to provide price support via contrarian trading strategies, such as increasing buyback intensity when order imbalances and short selling interest is higher, both of which put downward pressure on stock prices. Thus, these studies provide initial evidence suggesting that firms repurchase stock to provide liquidity.

Other studies find a negative relation between buybacks and liquidity. For example, Barclay and Smith (1988) find that bid-ask spreads widened after stock repurchase announcements during 1983 to 1986. They argue that the widening of bid-ask spreads reflects actions by market-makers to increase compensation for transacting against informed company insiders. Consistent with these findings, Brockman and Chung (2001) also find that buyback activity significantly reduces stock liquidity. They study repurchases by companies listed on the Stock Exchange of Hong Kong, which uniquely requires listed firms to disclose all repurchases

by the start of the next business day. Brockman and Chung (2001) find that bid-ask spreads widen on days when share repurchases are executed versus non-repurchase days. They conclude that buyback activities impose a cost in the form of lower liquidity. Similar findings are reported by Ginglinger and Hamon (2007) for a sample of 352 firms listed in France.

Other studies find negligible evidence of share repurchase announcements influencing stock liquidity. For example, Singh et al. (1994) match a sample of 181 OMR announcements over 1984 to 1990 to a control sample of non-repurchasing firms with similar market capitalizations. They present regressions that fail to uncover differences in bid-ask spreads around the announcement date. Wiggins (1994) studies a sample of 195 repurchase announcements over 1988 to 1990 and finds a negligible decline rather than increase in spreads and no evidence of a shift in depths following the announcement of repurchases. Similarly, Miller and McConnell (1995) study 248 repurchase announcements over 1984 to 1988 and find no relation between repurchases and bid-ask spreads. Franz et al. (1995) study 157 buyback announcements over 1983 to 1987 and find a decline in bid-ask spreads after adjusting for dealers' order-processing and inventory-holding costs.

Taken together, existing research is mixed on whether one might expect a positive or negative relation between buyback activity and measures of stock liquidity. Many of the existing studies examine non-U.S.-listed firms or utilize small or older sample periods that predate changes in SEC rules, technology, and the rise of passive indexing and retail investors. Moreover, there is sparse literature on the influence between stock buybacks and volatility. Thus, we revisit the relation between buybacks, liquidity, and volatility for a large cross-section and time series of over 10,000 firms across 17 years. We also use a wide range of measures of liquidity and volatility that we define in the next section.

3. Sample and Research Design

A. Buybacks and Sample Selection

We construct our sample by first downloading all firms in the Center for Research in Security Prices (CRSP)/Compustat merged databases from Wharton Research Data Services over 2004 to 2020. We begin our sample in the first quarter of 2004 because this period coincides with the December 2003 effective data of SEC rules requiring companies to report quarterly share repurchase activity. Thus, Compustat's full coverage of the number of shares repurchased each quarter begins in 2004. After dropping firms with missing values for our measures of stock liquidity, the final sample includes 10,928 unique firms and 340,327 firm-quarters.

Buyback Activity

We construct two measures of buyback activity. First, we create an indicator variable, buyback active (*BB_ACTIVE*), that equals 1 if a firm repurchases any shares during a quarter, and otherwise 0. Thus, *BB_ACTIVE* is meant to proxy for the *extent* of buyback activity during the quarter. Second, we measure the *intensity* of buyback activity by dividing the number of shares repurchased during the quarter by the shares outstanding at the end of the prior quarter, which we label *BB_PCTOUT*. For firms with missing information on buyback activity, we assume they repurchased zero shares during the quarter. In regression estimates, we take the natural log of 1 plus the ratio of shares repurchased to shares outstanding, to normalize this measure.

Buyback Disclosure

We also capture buyback disclosure using data from the S&P Capital IQ–Key Developments (CIQ-KD) database. The CIQ-KD database contains summaries of events and news that could have a material impact on stock prices. We retain all news events related to share repurchases. We then classify news on buyback programs into three categories: announcements, updates, and expansions.

To identify announcements of new buyback programs, we retain all news events with event identification numbers 36 ("Buybacks"), 152 ("Potential Buybacks"), and 232 ("Buyback Transaction Announcements") in the CIQ-KD database. A random sample of these events shows that they tend to correspond to the announcement of a new buyback plan, firms seeking board or shareholder approval of a buyback plan, or board authorization of a new buyback plan. We create a variable, *BB_ANNOUNCE*, that equals 1 for firms with any of these three event types during a calendar-quarter, and otherwise 0.

To detect updates on quarterly share repurchases, we retain event identification number 231 ("Buyback Tranche Update") in the CIQ-KD database. This event reflects disclosures of buyback activity from a previously announced repurchase program. The event type almost always reports the quarter of reporting, the number of shares repurchased, and often the repurchase price or percentage of repurchase program

that is complete. We generate an indicator variable, *BB_UPDATE*, that equals 1 if a firm provides at least one disclosure of this event type during the quarter, and otherwise 0.

We also measure buyback expansions, which are event identification number 230 ("Buyback—Change in Plan Terms") in the CIQ-KD database. We analyze a random sample of these disclosures and find they mostly reflect an extension of time to repurchase shares under an existing program or an increase in the authorized number of shares they can repurchase. We generate the indicator variable, *BB_EXPAND*, that equals 1 if any of these event type disclosures are made during a quarter, and otherwise 0.[19]

B. Measures of Stock Liquidity

The academic literature designates a stock as having higher liquidity if market participants can quickly trade large quantities at a low cost with little price impact (Liu, 2006). Thus, stock liquidity is a function of trading quantity, speed, cost, and price impact. Given that stock liquidity is highly dimensional, prior researchers have employed a number of metrics to capture these properties.

Amihud Illiquidity

Amihud (2002) introduces a measure of stock illiquidity that is among the most widely used measures of trading cost-based liquidity in the academic literature (Le and Gregoriou, 2020). Amihud's (2020) illiquidity (*ILLIQ*) measure is a return-to-volume metric that captures the sensitivity of daily stock price movements per $1 of trading volume. Thus, it captures the price impact of stock trading. It is calculated in Equation (1) as follows:

$$ILLIQ_{it} = \frac{1}{D_{it}} \sum_{d=1}^{D_{it}} \frac{|R_{idt}|}{Dvol_{idt}}$$

where *ILLIQ* is the illiquidity ratio of stock *i* in period *t*, D_{it} is the number of trading days in the period *t* for stock *i*, $|R_{idt}|$ is the absolute value of the daily return for stock *i* on day *d* in the period *t*, and $Dvol_{idt}$ is dollar trading volume for stock *i* on day *d* in the period *t*. We average *ILLIQ* over calendar-quarters during our sample period. Higher values of *ILLIQ* indicate that the stock is less liquid because the return to trading volume is higher.

In comparison to other liquidity measures, *ILLIQ* has the advantages that it is both widely available for all stocks with basic trading data and captures the effects of trading volume on stock price movements. Thus, *ILLIQ* reflects transaction costs (Acharya and Pedersen, 2005). Some work criticizes *ILLIQ* by arguing that the volume effect on stock returns is caused by mispricing and not compensation for illiquidity (Lou and Shu, 2017). Others note that *ILLIQ* suffers from a size bias due to the positive correlation between trading volume and market capitalization (Cochrane, 2005). Thus, in the case of two stocks with identical returns, the one with a smaller market capitalization will mechanically have a higher value of *ILLIQ*. Amihud's *ILLIQ* also ignores time-series and cross-sectional variation in trading frequency.

19. The CIQ-KD database also contains event types 234 ("Buyback Transaction Closings") and 233 ("Buyback Transaction Cancellations"), which are present in 3.96% and 0.02% of sample quarters, respectively.

Bid-ask Spread

Another set of liquidity measures reflects the costs associated with executing a stock trade. One of the most popular and strongest transaction costs measures of liquidity utilizes the spread of the bid and ask price for stocks (Fong et al., 2017). Prior work notes that bid-ask spreads reflect three dimensions of trading costs: order processing costs, information asymmetry, and inventory costs (Demsetz, 1968; Stoll, 1978; Ho and Stoll, 1981).

We measure bid-ask spreads as the closing percentage quoted spread (*SPREAD*) introduced by Chung and Zhang (2014). It is estimated using daily closing bid and ask prices and is calculated in Equation (2) as follows:

$$SPREAD_{it} = \frac{1}{D_{it}} \sum_{d=1}^{D_{it}} \frac{Closing\ ask_{idt} - Closing\ bid_{idt}}{(Closing\ ask_{idt} - Closing\ bid_{idt})/2}$$

where $SPREAD_{it}$ is the closing percentage quoted spread of stock *i* in the period of time *t*, D_{it} is the number of trading days in time *t*, and $Closing\ ask_{idt}$ and $Closing\ bid_{idt}$ are the closing ask and bid prices of stock *i* on day *d*, respectively. Stocks with higher values of *SPREAD* are considered to be less liquid.

Dollar Trading Volume

Trading volume-based measures of liquidity utilize the number of stock transactions to identify whether the security is more or less liquid. We use two standard measures of trading volume: dollar trading volume and stock turnover. Trading volume-based measures are intuitively linked to bid-ask spreads since a stock transaction will execute only when the bid and ask price overlap. Thus, larger bid-ask spreads imply potentially lower trading volume. However, trading volume can also impact bid-ask spreads. Easley and O'Hara (1992) argue that greater trading volume leads to larger spreads due to the information component of the bid-ask spread.

Dollar trading volume (*DVOLUME*) is the value of traded shares between buyers and sellers. Prior work shows that trading volume is a significant determinant of the liquidity component of stock prices (O'Hara, 2003) and impacts the cost of holding stocks for broker-dealers (Stoll, 1978). It is calculated in Equation (3) as:

$$DVOLUME_{it} = \sum_{j=1}^{n} P_{ikt} \times Vol_{ikt}$$

where $DVOLUME_{it}$ is the dollar trading volume of stock *i* over the period of time *t*. It is computed as the sum of the dollar value of *n* transactions of stock *i* during period *t*. P_{ikt} and Vol_{ikt} are the price and quantity of stock *i* for transaction *k* at the time period *t*, respectively. Stocks with higher *DVOLUME* are considered to be more liquid. *DVOLUME* is widely used as a proxy for liquidity in the academic literature (e.g., Lee, 1993; Chordia et al., 2001).

Stock Turnover Ratio

Another trading volume-based measure of stock liquidity is the turnover ratio (*TURN*). This measure is calculated as the number of traded shares divided by the number of shares outstanding in Equation (4) as follows:

$$TURN_{it} = \frac{1}{D_{it}} \sum_{d=1}^{D_{it}} \frac{Vol_{idt}}{Shrout_{idt}}$$

where $TURN_{it}$ is the turnover ratio of stock *i* during the period of time *t*, D_{it} is the number of trading days, and Vol_{idt} and $Shrout_{idt}$ are the daily number of shares trading and shares outstanding of stock *i*, respectively. Prior work (e.g., Easley and O'Hara, 1992) shows that *TURN* reflects market information from trading and thus impacts stock liquidity. Moreover, since *TURN* accounts for the market capitalization of stocks, it is likely a superior trading volume-based measure of stock liquidity when compared to *DVOLUME*.

Zero Return Days

One drawback of liquidity measures such as *ILLIQ* is that they do not account for days without trading, which likely reflects important dimensions of illiquidity (Le and Gregoriou, 2020). Thus, we compute an additional measure of liquidity based on the number of trading days with zero returns. In Equation (5), we follow Lesmond et al. (1999) by computing the ratio of the number of days with zero return divided by the total number of observable trading days (*ZEROS*):

$$ZEROS_{it} = \frac{Zero\ daily\ returns_{it}}{D_{it}}$$

where $ZEROS_{it}$ is the ratio of the number of days with returns equal to zero for stock *i* during the period of time *t*, $Zero\ daily\ returns_{it}$ is the number of zero return days of stock *i* over time *t*, and D_{it} is the number of available trading days.

Stocks with higher values of *ZEROS* are considered less liquid. This measure is based intuitively on difficulties in trading highly illiquid stocks, higher transaction costs, and periods when investors with private information are less likely to trade (Lesmond et al., 1999; Lesmond, 2005). Prior work confirms that *ZEROS* is a strong proxy for stock liquidity (Goyenko et al., 2009).

C. Measures of Volatility

We compute three proxies of volatility, two of which are historical measures based on realized changes in stock prices using data from CRSP. Stock return volatility (*RETVOL*) is the standard deviation of daily stock returns over the calendar-quarter. We also compute abnormal stock returns by subtracting out the daily returns of the CRSP value-weighted index. We then estimate abnormal stock return volatility (*ARETVOL*) as the standard deviation of abnormal daily returns over the calendar-quarter. Higher values of *RETVOL* and *ARETVOL* indicate greater realized return volatility. We annualize both measures by *multiplying by √252.*

For our third measure, we ascertain implied volatility (*IVOL*) derived from the prices of stock options. These data are obtained from the OptionMetrics Standardized Options database. Following Goyal and Saretto (2009), we average the implied volatilities of the call and put contracts that are closest to at-the-money (ATM) and are one month to maturity (30 days). Higher values of *IVOL* indicate that, over the life of the option, the market expects larger changes in the underlying stock price.

Tests of stock return volatility focus on a subsample of 340,215 firm-quarters. A subsample of 194,222 firm-quarters has data on implied volatility during 2004 to 2020.

4. Main Results

A. Summary Statistics

In Table 1, we present summary statistics. Firms actively repurchase shares in 27.8% of firm-quarters during our sample period. The average firm repurchases 0.3% of shares outstanding each quarter. When conditioning on non-zero repurchase activity, sample firms repurchase an average of 1.1% of shares outstanding each quarter. We discuss time trends in buybacks in the next subsection.

	Mean	Median	Standard Deviation	Firm Quarters
Buyback Activity				
BB_PCTOUT	0.003	0.000	0.020	340,327
BB_PCTOUT (non-zero)	0.011	0.005	0.037	94,776
BB_PCTOUT (log-transformed)	0.003	0.000	0.013	340,327
BB_ACTIVE	0.278	0.000	0.448	340,327
Buyback Disclosure				
BB_ANNOUNCE	0.053	0.000	0.224	340,327
BB_UPDATE	0.267	0.000	0.442	340,327
BB_EXPAND	0.017	0.000	0.129	340,327
Stock Liquidity				
ILLIQ	0.191	0.001	0.955	340,327
SPREAD	0.009	0.002	0.018	340,327
DVOLUME ($ millions)	35.700	3.196	185.135	340,327
DVOLUME (log-transformed)	14.746	14.977	2.706	340,327
TURN	0.659	0.361	9.467	340,327
TURN (log-transformed)	–1.163	–1.019	1.192	340,327
ZERO	0.033	0.016	0.047	340,327
Volatility				
RETVOL	0.499	0.395	0.435	340,219
ARETVOL	0.467	0.362	0.430	340,219
IVOL	0.474	0.408	0.257	194,222
Firm Characteristics				
SIZE	6.637	6.630	2.223	340,327
LEVERAGE	0.227	0.170	0.227	340,327
MTB	1.597	1.082	1.761	340,327
ROA	–0.002	0.010	0.064	340,327
CASH	0.202	0.097	0.241	340,327
DIVIDENDS	0.003	0.000	0.006	340,327
R&D	0.013	0.000	0.031	340,327
FOROPS	0.370	0.000	0.483	340,327
ANALYSTS	4.640	2.000	6.200	340,327
RANALYSTS	0.002	–0.132	1.000	340,327

	Mean	Median	Standard Deviation	Firm Quarters
OPTIONS	0.011	0.001	0.028	340,327
S&P500	0.099	0.000	0.299	340,327
Uncertainty Measures				
HIEXPVOL	0.500	1.000	0.500	187,192
EPU	0.135	0.126	0.063	340,327

Table 1: Summary Statistics

In terms of disclosure, 5.3% of firm-quarters have a new buyback announcement, which includes either plans for the board to vote on a share repurchase program or announcing that the board has approved a new program. We find that 26.7% of firm-quarters include a buyback disclosure update on the number of shares repurchased and the average repurchase price. Approximately 1.7% of firm-quarters include a disclosure to expand the duration or size of the previously announced repurchase program.

Table 1 also provides sample statistics on our key measures of liquidity and volatility. Recall that each of these measures is estimated at the daily level and then averaged across the calendar-quarter. Sample firms have an average daily Amihud illiquidity value of 0.19 and average (median) bid-ask spread of 90 (20) basis points. The average firm has $35.7 million in daily trading volume and its stock turns over 0.66 times each day. The average sample firm has 3.3% of trading days each quarter with zero returns. The standard deviation of daily stock returns is just over 3%, which annualizes to just under 50%. Table 1 shows similar estimates of abnormal stock return volatility and implied volatility, as the average firm has an annualized average of 47% for both measures.

Across firm characteristics, the median firm has 17% debt, a return on assets close to 1%, and approximately 10% of assets in cash. These firms invest an average of 1.3% of assets in quarterly R&D, pay an average of 0.3% of assets in quarterly cash dividends, and have an average (median) market-to-book value of 1.6 (1.1). Approximately 37% of sample firms have foreign operations and the average (median) firm has 4.6 (2) analysts providing quarterly earnings forecasts. Approximately 10% of sample firms are included in the S&P500 index.

B. Time Trends in Buybacks

Full Sample Repurchase Activity

Figure 1 shows the time-series trend for both measures of buyback activity over the full sample period. In this figure, quarterly buyback intensity (*BB_PCTOUT*) is depicted using bars that correspond to the left y-axis. The percentage of firms actively repurchasing shares (*BB_ACTIVE*) is depicted as a line graph whose scale is provided on the right y-axis.

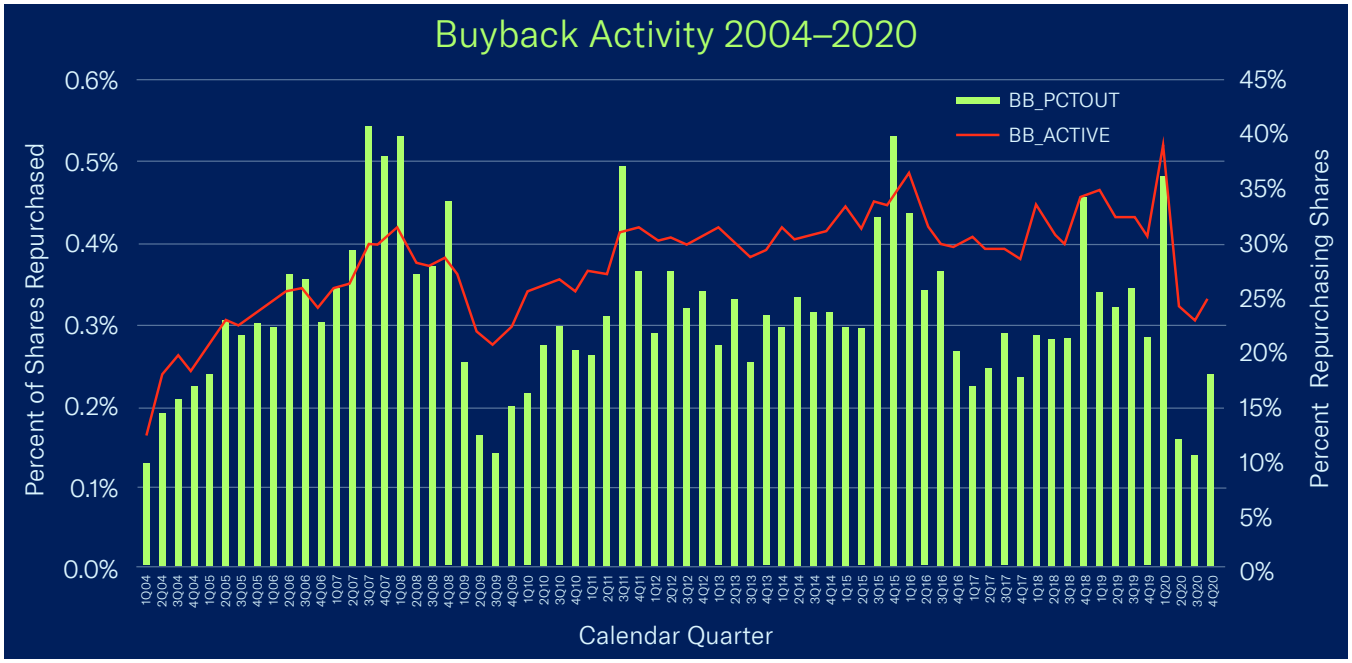

Figure 1: Buybacks over time

The plots show that both measures of buyback activity increase from 2004 to 2007. Buybacks decline during the financial crisis of 2008 and bottom out in 3Q09 before increasing again. These patterns likely correspond to periods when firms have surplus cash that can be returned to investors.

Buyback intensity spikes during 1Q08, 3Q11, 4Q15, 4Q18, and 1Q20, which tend to align with the approximate start of presidential election years. These patterns motivate us to conduct additional analyses of presidential elections in Subsection 5.2.

The presence of buyback activity increases over 1Q04 to a peak of 32% in 1Q08, before falling to 21% in 3Q09. Buyback activity increases again and peaks at 36% in 1Q16, then oscillates before it reaches a high of 39% in 1Q20.

Buyback activity fell precipitously in 2Q20 to 23%, which is a decline of over 40% from the prior quarter, likely due to the onset of the COVID-19 pandemic.

Repurchase Activity by S&P500 Index Membership

Prior academic literature shows that buyback activity varies based on factors such as firm size and profitability (e.g., Bhattacharya and Jacobsen, 2016). Thus, in Figures 2 and 3, we further analyze time-series variation in buyback activity by partitioning our sample based on whether the firm is a member of the S&P500 index. S&P determines the constituents of the S&P500 index, which includes large capitalization stocks.[20]

20. A discussion of the index methodology is provided by S&P in "S&P U.S. indices methodology," June 2021, available at https://www.spglobal.com/spdji/en/documents/methodologies/methodology-sp-us-indices.pdf.

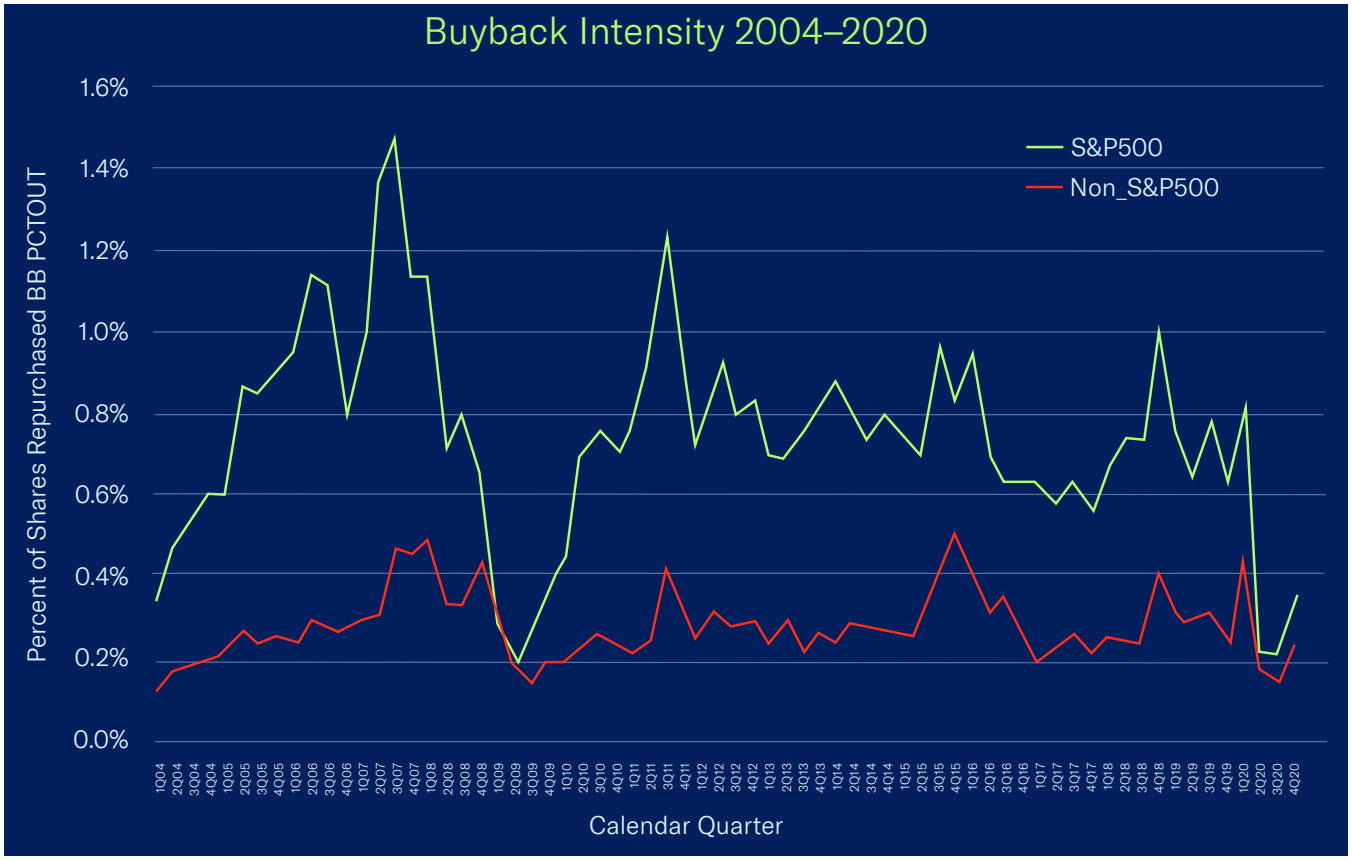

Figure 2: Share buyback intensity for S&P500 and non-S&P500 firms

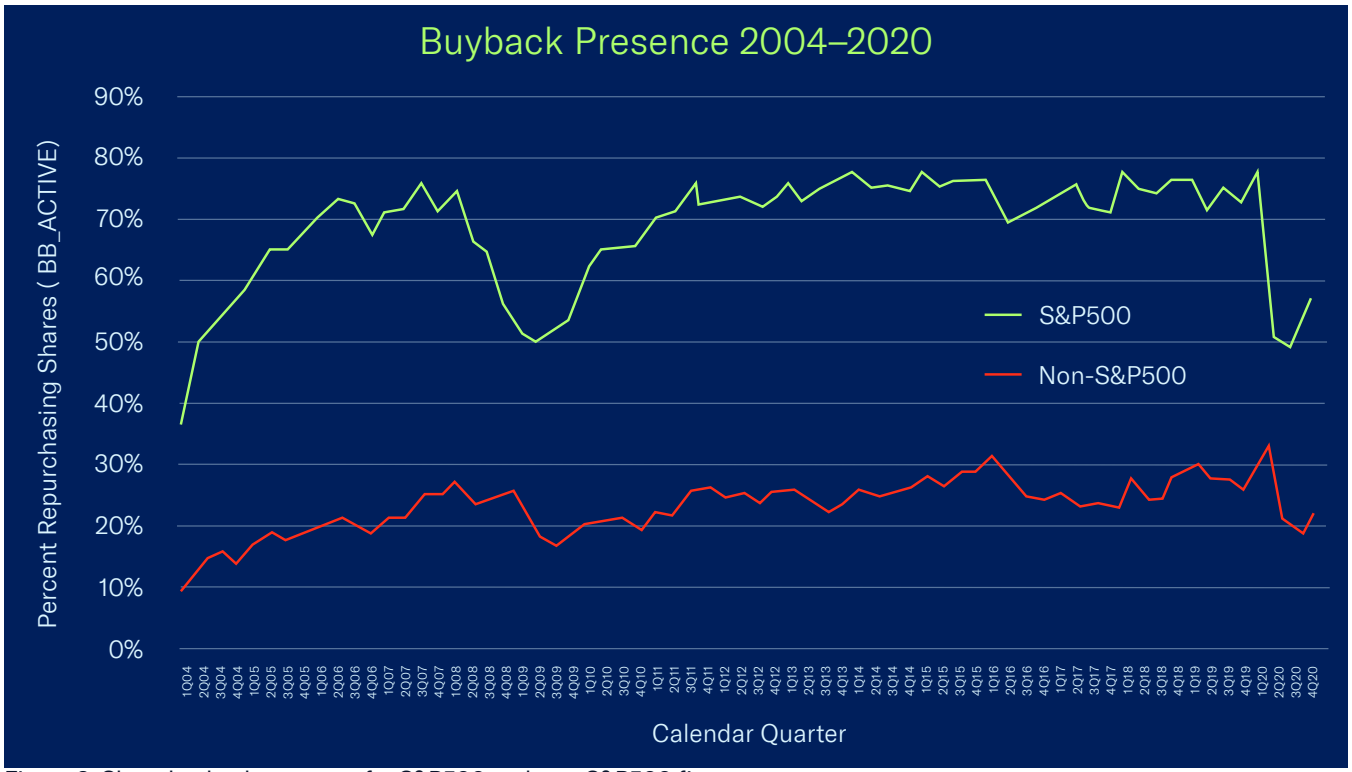

Figure 3: Share buyback presence for S&P500 and non-S&P500 firms

Figure 2 shows that variation in buyback intensity (*BB_PCTOUT*) over time is substantially higher for firms that are members of the S&P500. For example, increases in buyback activity during 2004 to 2007 and 2009 to 2011 are more pronounced for S&P500 members. Similarly, the proportional decline in buyback activity during 2008 to 2009 and in early 2020 are stronger for S&P500 index members.

Figure 3 shows similar trends for the percentage of firms actively repurchasing shares (*BB_ACTIVE*). For the full sample, the average percentage of repurchasing shares is 69% for S&P500 members and 23% for non-S&P500 members. These differences likely reflect substantial differences in variation in surplus cash, as larger and profitable firms, such as members of the S&P500, tend to generate greater amounts of free cash flow. This graph reinforces the notion that younger, smaller firms need cash for investment and R&D and have less surplus cash for buyback investment than older, larger firms that tend to compose the S&P500.

Payouts Over Time

Firms can pay out surplus cash via dividends or stock buybacks. Prior literature points to the flexibility of share repurchases as one of their desirable traits versus dividends (e.g., Brav et al., 2005). In Figure 4, we plot time-series variation in buybacks and dividends as a percentage of net income. Figure 4 shows that stock repurchase exhibits substantially more variation than dividends, especially during periods when profitability are higher (e.g., 2007) or lower (e.g., 2009).

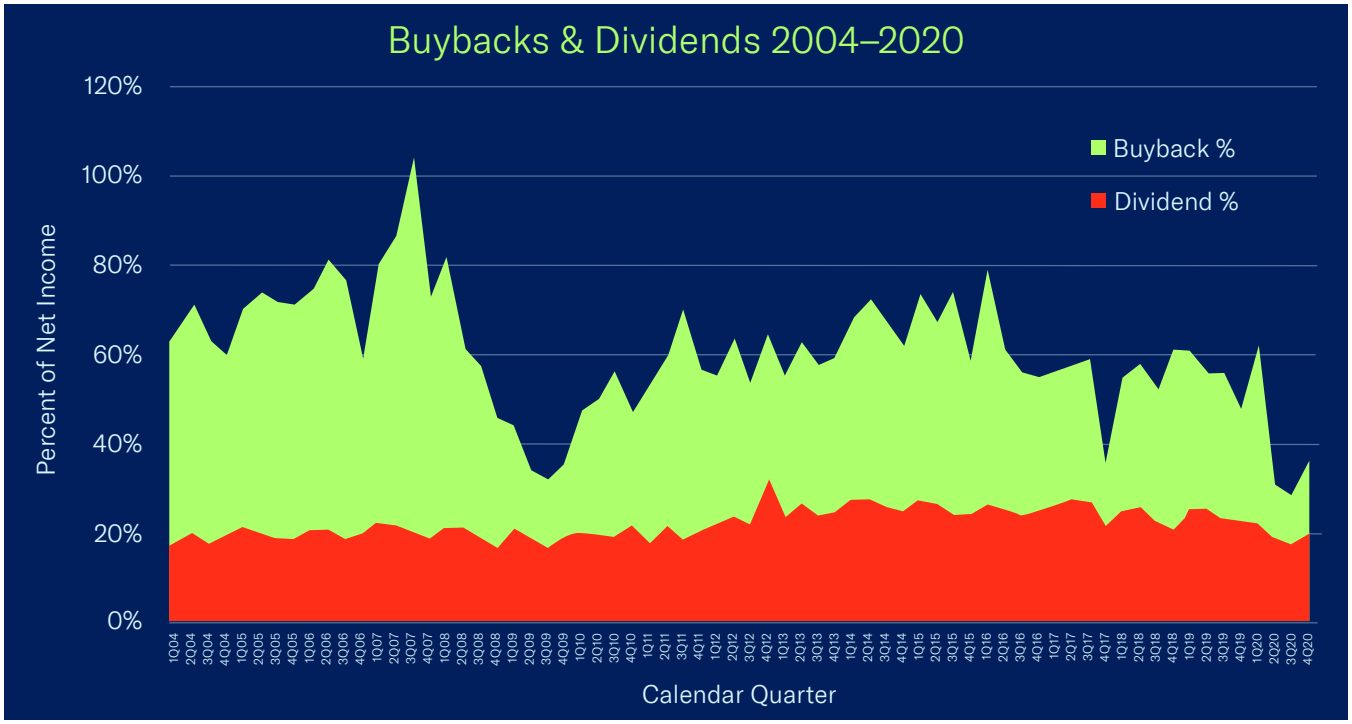

Figure 4: Payouts over time

C. Correlation of Buybacks with Stock Liquidity and Volatility

We present a pairwise correlation matrix of our buyback, liquidity, and volatility measures in Table 2. Columns (1) and (2) provide initial evidence that buyback activity is correlated with lower levels of stock illiquidity and volatility. For example, the presence of buyback activity in a calendar-quarter is correlated with 15.4% lower bid-ask spreads, on average, and a 17% reduction in stock return volatility in Column (2), both of which are statistically different from zero at the 5% level or better. Moreover, Column (3) shows that the measures of liquidity and volatility are highly, but not perfectly, correlated with each other. Thus, each of these measures likely reflects unique dimensions of liquidity and volatility.

	BB_ PCTOUT	*BB_ ACTIVE*	*ILLIQ*	*SPREAD*	*DVOLUME*	*TURN*	*ZERO*	*RETVOL*	*ARETVOL*	*IVOL*
BB_ PCTOUT	1.0000									
BB_ ACTIVE	0.2502*	1.0000								
ILLIQ	–0.0172*	–0.0706*	1.0000							
SPREAD	–0.0360*	–0.1541*	0.6890*	1.0000						
DVOLUME	0.0770*	0.3016*	–0.3876*	-0.6155*	1.0000					
TURN	0.0448*	0.0839*	–0.3320*	-0.4554*	0.6867*	1.0000				
ZERO	–0.0363*	–0.1614*	0.2668*	0.4056*	–0.5408*	–0.3930*	1.0000			
RETVOL	–0.0354*	–0.1660*	0.2303*	0.4257*	–0.2224*	0.1500*	0.0987*	1.0000		
ARETVOL	–0.0400*	–0.1868*	0.2562*	0.4663*	–0.2765*	0.1072*	0.1480*	0.9891*	1.0000	
IVOL	–0.0624*	–0.2577*	0.0509*	0.4900*	–0.4382*	0.2240*	0.2244*	0.7447*	0.7431*	1.0000

Table 2: Correlation Matrix

D. Buybacks and Liquidity

In this subsection, we formally test the relation between buyback activity and stock liquidity by estimating the following equation using ordinary least squares (OLS) regressions in Equation (6):

$$Liquidity_{it} = \alpha + \beta_1 Buyback_{it} + X_{it} + Industry\ FE + Time\ FE + \epsilon_{it}$$

where each of the liquidity *measures* (*ILLIQ, SPREAD, DVOLUME, TURN, ZERO)* of stock *i* during the calendar-quarter *t* are tested separately as the dependent variables. The variable of interest, $Buyback_{it}$, is estimated separately using *BB_PCTOUT* and *BB_ACTIVE*, which allows us to estimate the intensive and extensive margins of stock repurchases on liquidity. We include calendar-quarter fixed effects, which adjust for time trends in liquidity and volatility, and industry fixed effects using two-digit Standard Industrial Classification

(SIC) codes to control for time-invariant industry-level factors.[21] For each regression, we estimate *t*-statistics based on robust standard errors double clustered at the firm and calendar-quarter level.

Based on extant academic research (e.g., Bhattacharya and Jacobsen, 2016), we include a vector of firm controls (X_{it}) that adjust our regression estimates for a wide range of firm characteristics. The Appendix defines these variables, which include standard controls such as firm size (*SIZE*), debt financing (*LEVERAGE*), market-to-book (*MTB*), return on assets (*ROA*), cash holdings (*CASH*), dividend payouts (*DIVIDENDS*), and investments in research and development (*R&D*) based on quarterly data from Compustat. All quarterly control variables are measured in the fiscal period that ends during the same calendar-quarter as the dependent measures of liquidity. However, the relation between buybacks and liquidity is similar if we lag these variables by one fiscal period.

Using annual Compustat data, we generate a foreign operations indicator variable (*FOROPS*) that equals 1 if the firm has a non-missing, non-zero value for pre-tax income from foreign operations in the fiscal year. We also control for analyst coverage (*ANALYSTS*) by counting the number of analysts providing quarterly earnings per share estimates using data from I/B/E/S. For our regressions, we orthogonalize analysts following with respect to firm size since large firms tend to attract more analysts. Thus, the variable residual analyst following (*RANALYSTS*) gauges the portion of analyst coverage not explained by firm size. We control for stock options by taking the natural log of 1 plus the ratio of stock options granted to common shares outstanding in the prior fiscal year (*OPTIONS*). Finally, we use a Python script to obtain information on membership in the Standard & Poor's 500 index (*S&P500*) from the CRSP database.

We report estimates of Equation (6) in Table 3. Panel A uses buyback intensity (*BB_PCTOUT*) as the variable of interest. Across all five measures of liquidity, the coefficient on *BB_PCTOUT* is statistically different from zero at the 1% level and indicates that greater buyback intensity is correlated with better stock liquidity. For example, in tests of *SPREAD* in Column (2), the coefficient on *BB_PCTOUT* is −0.023 with a *t*-statistic of −4.77 (*p*-value<0.001), which indicates that, all else equal, firms buying back a greater portion of their outstanding shares within a calendar-quarter tend to have significantly lower average bid-ask spreads.

21. The relation between buybacks and liquidity are similar if we replace industry fixed effects with firm fixed effects. We utilize industry fixed effects to avoid a reduction in sample size due to singleton observations.

	ILLIQ	*SPREAD*	*DVOLUME*	*TURN*	*ZERO*
Panel A: Intensity of buybacks					
BB_PCTOUT	–0.754***	–0.023***	5.959***	3.185***	–0.035***
	(–3.95)	(–4.77)	(8.99)	(7.44)	(–4.18)
SIZE	–0.160***	–0.005***	1.082***	0.246***	–0.011***
	(–11.60)	(–15.55)	(70.37)	(18.55)	(–26.19)
LEVERAGE	0.176***	0.005***	–0.651***	0.138***	0.014***
	(5.92)	(7.42)	(–11.31)	(3.46)	(10.69)
MTB	–0.050***	–0.001***	0.396***	0.065***	–0.005***
	(–7.98)	(–10.65)	(35.70)	(7.75)	(–20.45)
ROA	–0.319**	–0.025***	0.799***	–1.075***	–0.043***
	(–2.57)	(–8.95)	(2.74)	(–4.26)	(–5.59)
CASH	–0.253***	–0.006***	0.843***	0.709***	–0.005***
	(–6.77)	(–8.12)	(15.01)	(16.19)	(–3.43)
DIVIDENDS	–3.808***	–0.086***	3.198	–13.969***	–0.251***
	(–5.66)	(–6.27)	(1.61)	(–9.57)	(–7.65)
R&D	–1.588***	–0.035***	1.809***	0.297	–0.022*
	(–6.04)	(–7.66)	(4.28)	(0.85)	(–1.99)
FOROPS	–0.031***	–0.001***	0.190***	0.006	–0.003***
	(–2.75)	(–5.17)	(7.32)	(0.30)	(–5.59)
ANALYSTS	–0.001	–0.001***	0.431***	0.161***	–0.003***
	(–0.16)	(–6.79)	(27.77)	(16.44)	(–11.83)
OPTIONS	–0.629***	–0.016***	1.601***	1.458***	–0.035***
	(–3.43)	(–3.42)	(3.20)	(3.33)	(–3.88)
S&P500	0.338***	0.009***	0.141***	–0.330***	0.017***
	(11.73)	(15.31)	(3.30)	(–9.79)	(14.55)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,323	340,323	340,323	340,323	340,323
Adjusted R^2	0.120	0.320	0.792	0.292	0.277

	ILLIQ	*SPREAD*	*DVOLUME*	*TURN*	*ZERO*
Panel B: Extent of buybacks					
BB_ACTIVE	–0.047***	–0.002***	0.242***	0.009	–0.003***
	(–5.35)	(–9.02)	(13.88)	(0.68)	(–7.59)
SIZE	–0.158***	–0.005***	1.076***	0.247***	–0.011***
	(–11.54)	(–15.47)	(70.06)	(18.51)	(–25.92)
LEVERAGE	0.173***	0.005***	–0.635***	0.139***	0.014***
	(5.84)	(7.33)	(–11.01)	(3.47)	(10.56)
MTB	–0.050***	–0.001***	0.395***	0.064***	–0.005***
	(–7.97)	(–10.64)	(35.74)	(7.67)	(–20.50)
ROA	–0.303**	–0.024***	0.734**	–1.050***	–0.042***
	(–2.43)	(–8.75)	(2.51)	(–4.15)	(–5.43)
CASH	–0.258***	–0.006***	0.870***	0.712***	–0.005***
	(–6.89)	(–8.33)	(15.45)	(16.12)	(–3.62)
DIVIDENDS	–3.660***	–0.081***	2.422	–14.028***	–0.243***
	(–5.43)	(–5.91)	(1.22)	(–9.61)	(–7.40)
R&D	–1.586***	–0.035***	1.806***	0.302	–0.022*
	(–6.04)	(–7.67)	(4.28)	(0.86)	(–1.98)
FOROPS	–0.029**	–0.001***	0.179***	0.008	–0.003***
	(–2.54)	(–4.84)	(6.96)	(0.37)	(–5.33)
ANALYSTS	0.001	–0.001***	0.422***	0.163***	–0.003***
	(0.33)	(–6.19)	(27.49)	(16.59)	(–11.42)
OPTIONS	–0.636***	–0.016***	1.643***	1.463***	–0.035***
	(–3.46)	(–3.45)	(3.24)	(3.33)	(–3.90)
S&P500	0.347***	0.010***	0.100**	–0.323***	0.017***
	(11.91)	(15.63)	(2.36)	(–9.68)	(15.10)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,323	340,323	340,323	340,323	340,323
Adjusted R^2	0.121	0.321	0.792	0.291	0.278

Table 3: Buybacks and Liquidity

In Panel B, we report regression results where the buyback indicator (*BB_ACTIVE*) is the variable of interest. Across all measures of liquidity except turnover, the presence of buyback activity is statistically related to liquidity improvements in the stock at the 1% level. Moreover, the magnitude of improvements in liquidity is economically meaningful. For example, in tests of *SPREAD* in Column (2), the coefficient on *BB_ACTIVE* is −0.00155 (which is rounded to −0.002 in the table). This 15.5-basis-point reduction is a 17.9% relative decline in bid-ask spreads from the sample mean (0.00867) for firms that are actively repurchasing shares.

Key Takeaway 1: Companies that repurchase shares provide liquidity to the stock market. Greater investment in stock buybacks equates to larger improvements in liquidity. In turn, this liquidity reduces transaction costs for all investors and helps facilitate orderly markets.

E. Buybacks and Volatility

We next test the formal relation between buyback activity and return volatility by estimating Equation (7) using OLS:

$$Volatility_{it} = \alpha + \beta_1 Buyback_{it} + X_{it} + Industry\ FE + Time\ FE + \epsilon_{it}$$

where each of the liquidity *measures* (*RETVOL, ARETVOL, IVOL)* of stock *i* during the calendar-quarter *t* are tested separately as the dependent variables. The variables of interest, fixed effects, standard error clustering, and control variables are all identical to tests of liquidity in Equation (6). The results are reported in Table 4.

	RETVOL	*ARETVOL*	*IVOL*	*RETVOL*	*ARETVOL*	*IVOL*
BB_PCTOUT	−0.632***	−0.626***	−0.658***			
	(−4.89)	(−5.01)	(−6.68)			
BB_ACTIVE				−0.050***	−0.053***	−0.037***
				(−14.21)	(−17.19)	(−14.76)
SIZE	−0.058***	−0.069***	−0.059***	−0.057***	−0.067***	−0.059***
	(−29.87)	(−27.50)	(−32.48)	(−29.55)	(−27.26)	(−32.08)
LEVERAGE	0.206***	0.211***	0.136***	0.203***	0.208***	0.133***
	(11.49)	(11.53)	(13.23)	(11.39)	(11.43)	(12.90)
MTB	−0.008***	−0.011***	−0.017***	−0.008***	−0.011***	−0.017***
	(−4.38)	(−5.33)	(−11.48)	(−4.34)	(−5.30)	(−11.44)
ROA	−1.347***	−1.329***	−1.126***	−1.328***	−1.308***	−1.105***
	(−20.37)	(−21.17)	(−23.04)	(−20.29)	(−21.05)	(−22.57)
CASH	0.036**	0.034**	0.131***	0.030**	0.028**	0.124***
	(2.43)	(2.45)	(12.41)	(2.08)	(2.06)	(11.98)
DIVIDENDS	−5.833***	−5.678***	−4.858***	−5.679***	−5.514***	−4.737***
	(−17.88)	(−17.95)	(−17.41)	(−17.56)	(−17.60)	(−17.00)

	RETVOL	*ARETVOL*	*IVOL*	*RETVOL*	*ARETVOL*	*IVOL*
R&D	−0.754***	−0.789***	0.054	−0.753***	−0.787***	0.050
	(−5.92)	(−6.22)	(0.59)	(−5.93)	(−6.23)	(0.55)
FOROPS	−0.021***	−0.027***	−0.025***	−0.018***	−0.024***	−0.023***
	(−5.89)	(−7.39)	(−7.71)	(−5.18)	(−6.68)	(−7.20)
ANALYSTS	−0.009***	−0.011***	−0.015***	−0.007***	−0.009***	−0.014***
	(−5.15)	(−6.72)	(−10.86)	(−3.97)	(−5.44)	(−10.04)
OPTIONS	0.122***	0.106**	0.332**	0.114**	0.097**	0.324**
	(2.70)	(2.49)	(2.29)	(2.57)	(2.33)	(2.29)
S&P500	0.045***	0.059***	0.023***	0.055***	0.070***	0.030***
	(7.92)	(10.01)	(5.65)	(9.38)	(11.57)	(7.57)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,215	340,215	194,222	340,215	340,215	194,222
Adjusted R^2	0.332	0.322	0.605	0.334	0.324	0.608

Table 4: Buybacks and Volatility

Columns (1) to (3) use buyback intensity (*BB_PCTOUT*) as the variable of interest and (4) to (6) use buyback presence (*BB_ACTIVITY*). Across all six regression estimates, we find strong evidence that stock buybacks are statistically related to lower volatility at the 1% level. For example, the coefficient in Column (4) indicates that firms actively repurchasing their shares have a 5.0 percentage point reduction in return volatility (*RETVOL*) during the quarter, which is significant at the 1% level. When compared to the average quarterly volatility of 0.499, this indicates that the presence of buyback activity is associated with 10% lower stock return variation during the quarter. The results are similar if we use abnormal stock return volatility (*ARETVOL*) that adjusts for total stock market variation or use forward-looking estimates of implied volatility (*IVOL*) for the subsample that has traded stock options.

Key Takeaway 2: Stock buybacks are associated with significant reductions in both realized and anticipated stock return volatility. Thus, bans or limitations on buyback activity would likely result in higher stock market volatility.

F. Buybacks and Investor Savings

Firms that repurchase shares provide liquidity support to investors that want to sell positions. Liquidity support has three separate components: (1) the reduction in actual transaction costs (narrowing the bid-ask spread), (2) the reduction of price impact costs stemming from lower volatility, and (3) the implicit level of price support that a firm provides when it actively attempts to maintain prices at their fundamental values. We provide estimates of the cost savings related to lower transaction and price impact costs. The third benefit is unobservable and does not lend itself to estimation.

Transaction Costs

We first consider how improvements in bid-ask spreads benefit all investors by reducing transaction costs. Recall from Table 2 that in tests of *SPREAD*, the coefficient on *BB_ACTIVE* was −0.00155. This result indicates that firms actively repurchasing shares have a 15.5-basis-point reduction in transaction costs.[22] To quantify the total bid-ask spread savings (*SPREAD SAVINGS*) for investors in our sample, we specify Equation (8) as follows:

$$SPREAD\ SAVINGS_{i,t} = -0.0155 \times SPREAD_{i,t} \times DVOLUME_{i,t} \times BB\_ACTIVE_{i,t}$$

where *SPREAD* is the average closing bid-ask spread for stock *i* in period *t*, which we define in Subsection 3.2.2.; *DVOLUME* is the sum of dollar trading volume of stock *i* over the period of time *t*, which we define in Subsection 3.2.3.; and *BB_ACTIVE* equals 1 for firms repurchasing shares during the quarter. Thus, *SPREAD SAVINGS* represent the transaction cost savings for each stock and quarter in our sample. We scale this value by the number of trading days to calculate the daily average savings in bid-ask spreads and present the results in Panel A of Table 5.

	Full Sample	Buyback Percent Quintiles				
		Q1	Q2	Q3	Q4	Q5
Panel A. Transaction Costs						
Spread Savings						
Average per day ($)	53.7	65.2	40.7	50.5	55.8	56.4
Average per quarter ($)	3,381	4,110	2,554	3,181	3,513	3,548
Total per year ($ millions)	18.8	4.6	2.8	3.5	3.9	4.0
Total all years ($ millions)	320.4	77.9	48.4	60.3	66.6	67.3
Panel A. Transaction Costs						
Price Impact Savings (PIS)						
Average per day ($)	13.09	1.70	7.04	13.16	17.64	25.94
Average per quarter ($)	3,554	3	118	1,458	4,760	11,431
Total per year ($ millions)	1,245	0.2	8.3	102.2	333.5	800.8
Total all years ($ millions)	21,164	3	141	1,737	5,670	13,614

Table 5: Buybacks and Investor Savings

22. One basis point is equivalent to 0.01% or 1/100th of a percent.

The average buyback firm generates $53.7 in savings in bid-ask spreads per trading day. Summing this value for each sample firm across the calendar-quarter shows that the average buyback firm saves investors $3,381 in spreads per quarter. Using the percentage of shares repurchased (*BB_PCTOUT*) each quarter, we sort repurchasing firms into quintiles. We then report the estimates of spread savings for each quintile, which range from $2,554 per quarter for those in the second quintile to $3,548 per quarter for those in the highest quintile. Interestingly, the average firm in the lowest quintile of buyback intensity (Q1) has the largest amount of spread savings at $4,110 per quarter. Across all firms in our sample, spread savings total to $18.8 million per year or $320.4 million for the full sample period.[23]

Price Impact

We next estimate the buyback savings to investors stemming from reductions in the price impact aspect of liquidity. Since price impact typically increases with volatility, firms that provide liquidity during periods when there is net selling pressure will reduce the corresponding price impact associated with investor demand for liquidity.[24] We estimate the price impact savings from buyback-induced reductions in volatility using the so-called "square-root" model (Gomes and Waelbroeck, 2015). According to this model, price impact (*PI*) is a function of the square root of the relative trade size and daily price volatility, which we define in Equation (9) as:

$$PI_{i,t} = 2.8\sigma_{i,t}\sqrt{Q_{i,t} / V_{i,t}}$$

where is the daily stock return volatility for firm *i* on day *t*, is the number of shares of firm *i* repurchased on day *t*, and is average daily trading volume for firm *i* on day *t*. The estimate of the 2.8 scale factor is obtained from Gomes and Waelbroeck (2015).

We then estimate the price impact savings (*PIS*) in Equation (10) as:

$$PIS_{i,t} = 2.8\,\frac{0.05}{\sqrt{252}}\,\sqrt{Q_{i,t} / V_{i,t}} \times BB\_ACTIVE_{i,t}$$

where 0.05 is the coefficient on *BB_ACTIVE* from Table 4, which is the reduction in annualized volatility for firms that repurchase shares in a specific quarter *q*. For estimation purposes, we convert the quarterly number of shares repurchased to a daily estimate by assuming that shares are purchased ratably over the quarter—that is, . is estimated as a rolling average of daily trading volume in stock *i* over the 60 trading days prior to day *t*. equals 1 for firms that are actively repurchasing shares during the quarter, and otherwise 0.

23. An alternative approach to estimating transaction cost savings is to estimate bid-ask spread savings *based on the average daily dollar volume in our sample, which is $74.1 million for firms that are actively repurchasing shares. Multiplying the average daily dollar volume times the savings in bid-ask spread of 15.5 basis points indicates that investors save $74.1 million × 0.00155 = $114,855 per trading day, which multiplied by 62.91 trading days per quarter equates to $7.23 million per quarter on average. Our sample period includes 68 calendar-quarters, indicating the savings in bid-ask spreads totals $491.4 million over 2004 to 2020.*
24. Although a reduction in volatility seems intuitively beneficial, a brief discussion is warranted. In finance, the classical view is that risk—such as volatility—and expected return are positively related as risk-averse investors demand compensation for bearing more risk. For example, the Capital Asset Pricing Model posits that the expected returns of a well-diversified investor's portfolio are positively related to the portfolio's exposure to the risk of the overall market. Thus, one might erroneously conclude that if buybacks reduce volatility, it follows that investors will experience lower returns. This type of logic is flawed because buybacks are designed to reduce temporary volatility spikes associated with price pressure and would not be expected to affect systemic risk.

Next, in Equation (11), we estimate the dollar value of the price impact on day *t* for firm *i* as:

$$DPIS_{i,t} = PIS_{i,t} Q_{i,t} \hat{P}_{i,t}$$

where is the average of the closing prices on days and for firm *i*. The results of Equations (10) and (11) are presented in Panel B of Table 5.

The mean price impact savings per trade is 13.09 basis points. Across the quintiles of percentage of shares repurchased, estimates of price impact range from 1.70 to 25.94 basis points for firms in the lowest and highest quintiles of share repurchase intensity. As one would expect, the price impact benefits associated with the provision of liquidity via buybacks are the highest for firms that are the most active.

The mean dollar price impact savings per trade is $3,554. Estimates of the price impact savings range from $3 to $11,431 for firms in the lowest and highest repurchase intensity quintiles. The aggregate cost savings per year over the full sample is $1,245 million, which totals to $21,165 million of liquidity-induced losses that investors were able to avoid for the full sample period. We note that the estimated price impact savings in this table are losses that investors are able to avoid when companies provide liquidity via repurchases. These savings are not related to losses attributable to changes in the underlying intrinsic value of the firm's stock.

In Figure 5, we graph the aggregate investor benefits from spread savings and price impact across each year in our sample period. As the figure shows, the majority of buyback-induced liquidity savings stem from reductions in price impact. The peak savings in bid-ask spreads occur in 2008 at $55 million, while the peak price impact occurs in 2018 at just over $2 billion.

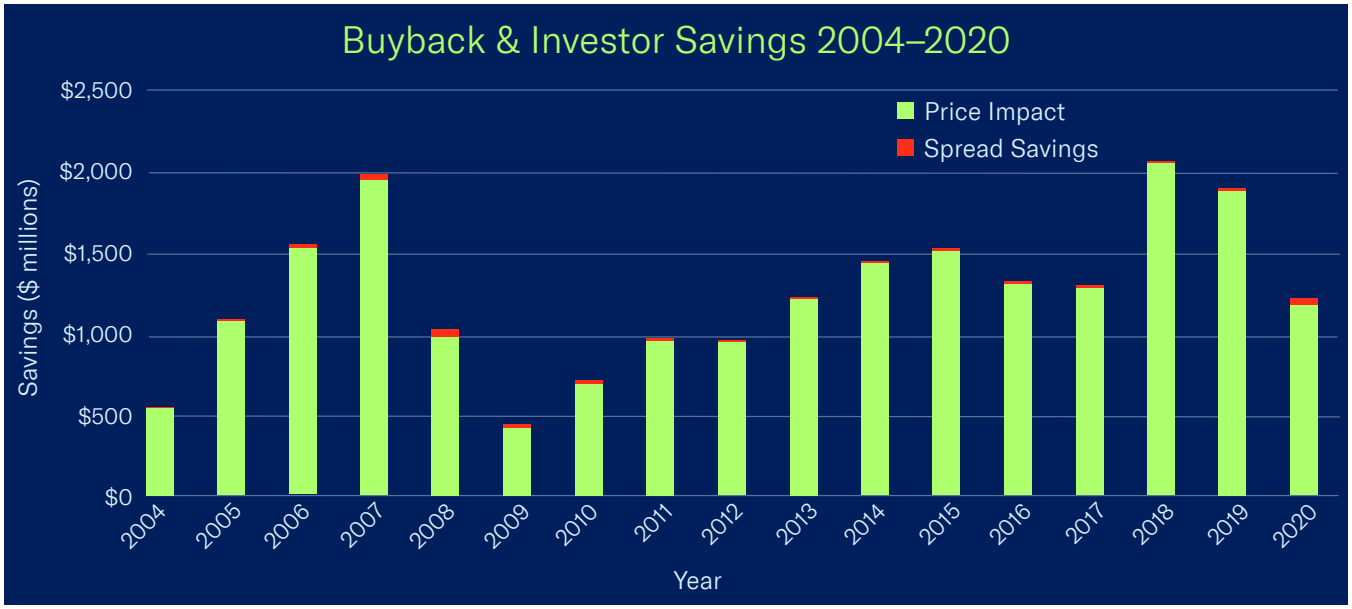

Figure 5: Investor benefits of buybacks

Retail Investors

We next consider how the price impact and transaction cost benefits of share repurchases benefit retail investors. To quantify the benefit for retail investors, we first consider their fraction of market participation. Estimates of retail investor participation range from 10% to 14% of U.S. equity trades before commission-free trading was introduced in 2013, and now represent as much as 23% in 2021.[25]

Table 5 shows that, during our sample period, buybacks generated $320 million in spread savings and $21,164 million in price impact savings for investors. Given that retail investors represent from 10% to 20% of order flow, we estimate that the liquidity provision of buybacks saved retail investors $2.1 to $4.3 billion during our full sample period. These values equate to retail investor savings of $126 to $253 million per year due to buyback activity.

Key Takeaway 3: Stock buybacks generate economically large benefits for retail investors. Since the SEC revised buyback activity disclosures in 2004, we estimate that buybacks have saved retail investors $2.1 to $4.2 billion in transaction and price impact costs.

25. See Katie Martin and Robin Wigglesworth, "Rise of the retail army: the amateur traders transforming markets," *Financial Times*, March 8, 2021, available at https://www.ft.com/content/7a91e3ea-b9ec-4611-9a03-a8dd3b8bddb5; Bloomberg Intelligence, "Stock-market gamification unlikely to end soon or draw new rules," *Bloomberg*, February 19, 2021, available at https://www.bloomberg.com/professional/blog/stock-market-gamification-unlikely-to-end-soon-or-draw-new-rules/; and Bill Hortz and David Aferiat, "Survey on the 2021 State of the Independent Retail Investor," *Nasdaq*, May 25, 2021, available at https://www.nasdaq.com/articles/survey-on-the-2021-state-of-the-independent-retail-investor-2021-05-25.

5. Additional Tests

A. Buybacks and Future Uncertainty

The evidence so far indicates that stock repurchase activity is correlated with reductions in stock illiquidity and volatility. In this subsection, we ask whether market-based measures of future volatility and uncertainty influence the properties of stock buybacks. For these tests, we compute expected volatility (*EXPVOL*) as the ratio of the implied volatility on the 30-day ATM stock options divided by the ***adjusted*** implied volatility on the 91-day ATM stock options on the first day of each calendar-quarter. For this measure, we adjust the implied volatility of the 91-day options to remove the implied volatility component of the 30-day options. We then partition the sample with data in OptionMetrics and create a variable, *HIEXPVOL*, that equals 1 if the firm's expected volatility is above the sample median value for each calendar-quarter; and else 0. We then estimate Equation (12) as follows:

$$Buyback_{it} = \alpha + \beta_1 HIEXPVOL_{it} + X_{it} + Industry\ FE + Time\ FE + \epsilon_{it}$$

where each of the buyback measures (*BB_PCTOUT, BB_ACTIVE, BB_ANNOUNCE, BB_UPDATE, and BB_EXPAND)* of stock *i* during the calendar-quarter *t* are tested separately as the dependent variables. All control variables, fixed effects, and standard error clustering are identical to Equations (6) and (7). Since these regressions include high dimensional fixed effects, we follow the advice of Greene (2004) in using a linear probability model via OLS rather than a *maximum likelihood estimator* to test the dependent indicator variables *BB_ACTIVE, BB_ANNOUNCE, BB_UPDATE, and BB_EXPAND.* If managers strategically use stock repurchases to calm markets during periods of high expected volatility, we anticipate that firms with higher *expected volatility* will be more proactive in repurchasing shares during the quarter in order to attenuate the market's expectation of volatility. Thus, we expect a positive coefficient on β_1.

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
HIEXPVOL	0.002***	0.119***	0.017***	0.121***	0.012***
	(11.18)	(17.47)	(8.55)	(11.73)	(9.28)
SIZE	−0.000	0.006**	0.012***	0.005	−0.000
	(−1.39)	(2.02)	(8.60)	(1.54)	(−0.09)
LEVERAGE	0.001**	−0.046**	−0.035***	−0.098***	−0.008**
	(2.13)	(−2.50)	(−6.12)	(−4.59)	(−2.46)
MTB	−0.000***	−0.007***	−0.001	−0.014***	0.000
	(−8.89)	(−2.98)	(−1.63)	(−5.94)	(0.39)
ROA	0.019***	0.869***	0.256***	1.007***	0.147***
	(12.29)	(12.22)	(10.47)	(12.19)	(6.81)

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
CASH	0.002*	−0.124***	0.022***	−0.106***	0.005
	(1.77)	(−5.88)	(3.61)	(−3.87)	(1.23)
DIVIDENDS	−0.048***	1.281*	−0.212	2.968***	−0.060
	(−4.16)	(1.89)	(−1.09)	(4.30)	(−0.46)
R&D	0.008	−0.029	0.135***	−0.076	0.079*
	(1.62)	(−0.17)	(2.67)	(−0.41)	(1.90)
FOROPS	0.001***	0.064***	−0.001	0.062***	0.002
	(3.99)	(6.83)	(−0.44)	(5.79)	(1.27)
ANALYSTS	0.000***	0.041***	−0.000	0.025***	0.002***
	(7.22)	(10.59)	(−0.28)	(6.58)	(2.93)
OPTIONS	0.001	−0.202**	0.015	−0.347**	−0.008
	(0.54)	(−2.07)	(0.66)	(−2.45)	(−0.59)
S&P500	0.003***	0.237***	0.002	0.135***	0.008***
	(9.30)	(16.85)	(0.35)	(8.09)	(3.26)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	186,863	186,863	186,863	186,863	186,863
Adjusted R^2	0.049	0.195	0.024	0.286	0.016

Table 6: Future Uncertainty and Buybacks

The results are reported in Table 6. Columns (1) and (2) indicate that firms with higher expected volatility on the first day of the quarter—where *HIEXPVOL* equals 1—tend to be more active and intensive with their buyback activity during the quarter. For example, the positive coefficient on *HIEXPVOL* in Column (2) is significant at the 1% level and indicates that firms with above-median values of expected volatility are 11.9% more likely to actively repurchase shares.

Column (3) shows that firms with higher expected volatility are also more likely to authorize a new buyback (*BB_ANNOUNCE*). The coefficient of 0.017 on *HIEXPVOL* is 32% of the sample mean of buyback announcements (0.053) and is significantly different from zero at the 1% level (*p-value*<0.001). The results in Columns (4) and (5) indicate that firms with high expected volatility also provide substantially more buyback updates and are more likely to expand the duration or magnitude of the repurchase program.

Overall, the regression estimates in Table 4 imply that managers can potentially influence volatility through their buyback activity. Table 6 extends this result and shows that managers utilize forward-looking estimates of volatility to inform their buyback decisions. The latter result is important as it helps attenuate potential concerns of coefficient bias due to endogeneity via reverse causality. In other words, one might

be concerned that the negative relation between buybacks and volatility shown in Table 4 could be interpreted as either (1) that buybacks reduce volatility or (2) that managers conduct more buybacks when volatility is lower. However, the results in Table 6 show that buyback activity is stronger when forward-looking volatility is higher and not lower as would be the case with reverse causality under interpretation (2). Thus, the evidence indicates that managers use buybacks to reduce volatility.

Key Takeaway 4: Managers attenuate volatility through their buyback activities and utilize market-based estimates of future volatility to inform their buyback decisions. When future volatility is expected to be higher, managers increase their buyback intensity.

B. Buybacks and Policy Uncertainty

To shed more light on the direction of causality between uncertainty and buyback activity, we conduct an additional analysis using exogenous variation in political uncertainty. Prior work links political uncertainty to plausibly exogenous deteriorations in overall market quality and liquidity (Pasquariello and Zafeiridou, 2014; Boone et al., 2021). For these tests, we use the economic policy uncertainty (*EPU*) index developed by Baker et al. (2016), which we obtain from the website policyuncertainty.com. For our analyses, we download the normalized monthly *EPU* index based on the relative volume of news articles discussing terms that reflect policy-related economic uncertainty. We then average these values at the calendar-quarter level and estimate regressions of buyback activity and disclosure as dependent variables.[26]

In particular, we estimate Equation (13) using OLS regressions:

$$Buyback_{it} = \alpha + \beta_1 EPU_t + X_{it} + Firm\ FE + \epsilon_{it}$$

where each of the buyback measures (*BB_PCTOUT, BB_ACTIVE, BB_ANNOUNCE, BB_UPDATE, and BB_EXPAND)* of stock *i* during the calendar-quarter *t* are tested separately as the dependent variables. All control variables are identical to Equations (6) and (7). However, since the variable of interest, EPU, is identical across all firms in a calendar-quarter, we do not include calendar-quarter fixed effects as these would absorb all variation in the EPU index. We also use firm fixed effects (which absorbs industry fixed effects) but the results are similar with either choice. We cluster standard errors at the firm level.

26. To confirm that economic policy uncertainty induces market volatility, we examine the correlation between the EPU index and the CBOE Volatility Index (VIX). We find a 49% correlation between quarterly variation in the EPU index and VIX during 2004 to 2020, which is statistically different from zero at the 1% level.

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
EPU	−0.000	0.114***	−0.073***	1.136***	0.007
	(−0.34)	(5.72)	(−9.95)	(48.38)	(1.63)
SIZE	0.000**	0.059***	0.009***	0.119***	0.006***
	(2.24)	(17.95)	(9.46)	(27.68)	(10.43)
LEVERAGE	−0.001**	−0.062***	−0.046***	−0.041***	−0.011***
	(−2.01)	(−5.35)	(−12.26)	(−2.67)	(−4.23)
MTB	−0.000***	−0.004***	−0.002***	0.002*	0.000
	(−7.04)	(−3.15)	(−5.47)	(1.71)	(0.32)
ROA	0.004**	0.087***	0.091***	−0.276***	0.026***
	(2.30)	(3.19)	(8.89)	(−8.58)	(3.96)
CASH	−0.000	−0.001	0.012***	0.036**	0.005**
	(−0.18)	(−0.06)	(2.97)	(2.23)	(2.01)
DIVIDENDS	0.020***	2.827***	0.489***	6.417***	0.252***
	(2.65)	(9.14)	(3.07)	(15.29)	(2.83)
R&D	0.005*	0.381***	0.071***	0.513***	0.069***
	(1.89)	(6.18)	(3.45)	(6.91)	(4.86)
FOROPS	0.000	0.046***	−0.001	0.103***	0.003*
	(1.23)	(5.85)	(−0.22)	(10.07)	(1.79)
ANALYSTS	0.001***	0.041***	0.008***	0.074***	0.003***
	(6.71)	(10.87)	(5.54)	(15.78)	(3.20)
OPTIONS	0.000	−0.093***	0.012	−0.348***	−0.029***
	(0.32)	(−2.61)	(1.03)	(−3.52)	(−2.84)
S&P500	0.001***	0.075***	0.006	0.070***	0.009***
	(3.20)	(4.86)	(1.11)	(3.54)	(2.96)
Firm FE	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	No	No	No
Firm Quarters	340,043	340,043	340,043	340,043	340,043
Adjusted R^2	0.097	0.439	0.058	0.467	0.067

Table 7: Political Uncertainty and Buybacks

The regression estimates of Equation (13) are presented in Table 7. In Column (1), the coefficient on *EPU* is not statistically different from zero, indicating that policy uncertainty does not influence the intensity of buyback activity per se. However, Column (2) shows that firms are more likely to repurchase shares during periods when the *EPU* index is higher. Interestingly, the results in Column (3) show that firms are less likely to announce a new buyback program during periods when the *EPU* index

is higher. However, firms are substantially more likely to provide updates on buyback activity during periods of high policy uncertainty (Column 4). Thus, economic policy uncertainty seems to mostly influence *existing* buyback programs by inducing more firms to repurchase shares and provide updates on their repurchase activity during periods of exogenous spikes in uncertainty.

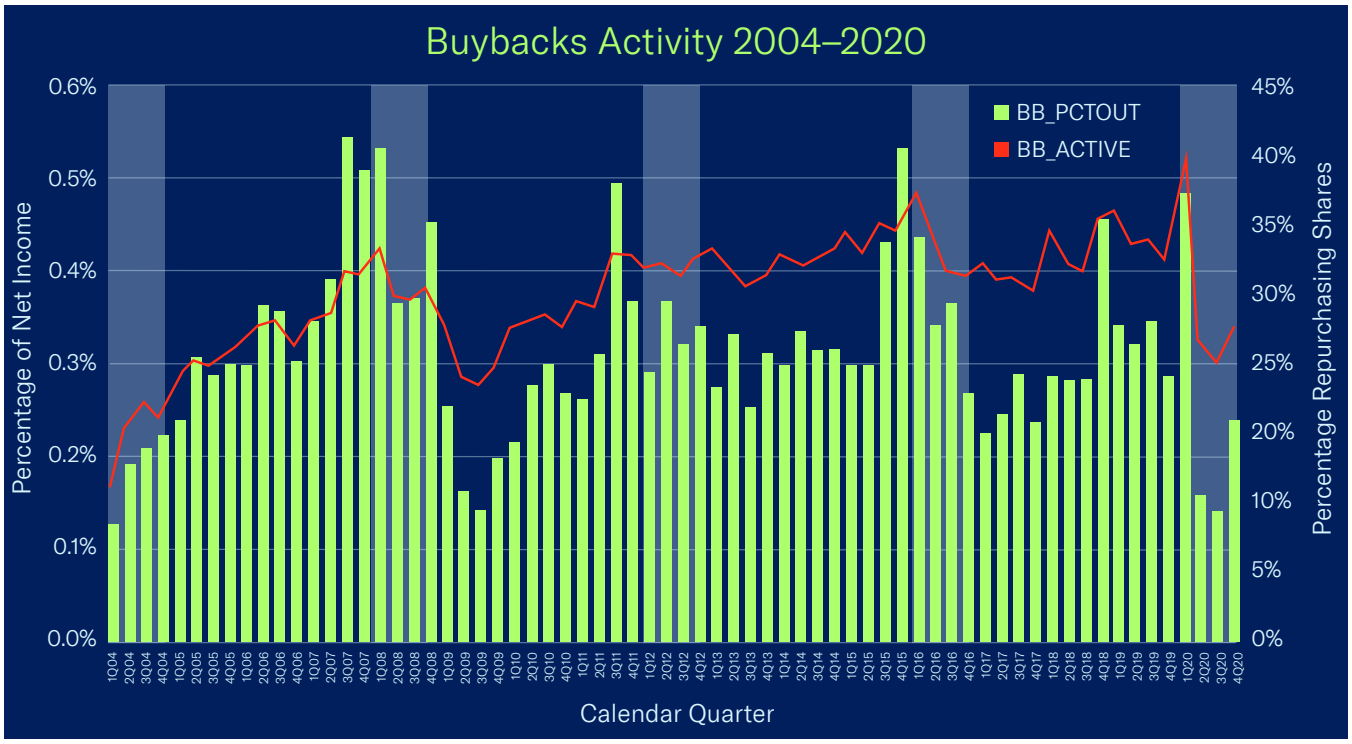

Figure 6: Buybacks and U.S. presidential elections

As an additional measure of how political uncertainty can influence repurchase activity, we again graph buybacks over time in Figure 6. This graph is similar to Figure 1 except we add gray shaded areas that depict U.S. presidential election periods, which we define as starting with the first primary election—the Iowa caucus—in January or February (Q1) and ending with the election in November (Q4).[27] Figure 6 shows that the intensity and presence of buyback activity tend to spike in the one or two quarters just before the presidential election period and persist into the first quarter of the election year, but often return swiftly to the prior level as the election period enters Q2. We observe a similar pattern in 4Q19 except buyback intensity dropped even further in 2Q20, likely due to the COVID-19 pandemic and its impact on business uncertainty and excess cash availability. Thus, this graph provides further evidence that uncertainty and volatility likely factor into firms' buyback decisions.

Key Takeaway 5: Economic policy uncertainty increases stock return volatility and reduces stock liquidity. Managers respond to transient variation in economic policy uncertainty by strengthening their buyback activities. When economic policy uncertainty can be anticipated, such as

27. The Iowa caucus dates during our sample period are January 19, 2004; January 3, 2008; January 3, 2012; February 1, 2016; and February 3, 2020. The U.S. presidential election dates are November 2, 2004; November 4, 2008; November 6, 2012; November 8, 2016; and November 3, 2020.

with presidential elections, managers proactively increase their buyback activities and, in the aggregate, likely have a calming effect on stock markets.

C. Buybacks and Institutional Trading

In this subsection, we examine the relationship between institutional trading and buyback activity. We hypothesize that managers will use buyback activity to provide price support and liquidity to their stock when institutional selling pressure is high, which we refer to as the "liquidity windows hypothesis."

Using data from the Thomson Reuters 13-F database, we measure three properties of institutional ownership. First, we measure the quarterly level of shares owned by institutions with more than $100 million in assets under management. We divide total institutional ownership by shares outstanding and label this variable *IOPCT_OWN*.

We also generate two measures of quarterly flows at the firm level using 13-F data. For each firm, we separately sum institutional buys and sells of stock based on the quarter-over-quarter net change in stock ownership. If an institution reduces its quarterly position, we consider it a "sell." We then calculate the percentage of institutional shares sold divided by total institutional ownership (*IOPCT_SELL*). Similarly, if an institution increases its quarterly position in a stock, we consider it a "buy." The ratio of shares bought during the quarter divided by total institutional ownership is labeled *IOPCT_BUY*. We then estimate buyback activity in Equation (14) using OLS regressions:

$$Buyback_{it} = \alpha + \beta_1 IOPCT\_SELL_{it} + \beta_2 IOPCT\_BUY_{it} + \beta_3 IOPCT\_OWN_{it} + X_{it} + Industry\ FE + Time\ FE + \epsilon_{it}$$

where each of the buyback measures (*BB_PCTOUT, BB_ACTIVE, BB_ANNOUNCE, BB_UPDATE, and BB_EXPAND)* of stock *i* during the calendar-quarter *t* are tested separately as the dependent variables. All control variables, fixed effects, and standard error clustering are identical to Equations (6) and (7). If firms strengthen the presence or intensity of buyback activity to provide liquidity when institutions are more likely to be selling rather than buying shares, then we expect a positive coefficient on β_1 that is larger (i.e., more positive) than the coefficient on β_2. The results are presented in Table 8.

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
IOPCT_SELL	0.067***	3.010***	0.706*	3.701***	0.358
	(3.93)	(5.60)	(1.99)	(9.43)	(1.29)
IOPCT_BUY	0.011	0.761*	−0.103	1.643***	0.018
	(0.66)	(1.67)	(−0.69)	(2.92)	(0.12)
IOPCT_OWN	0.002***	0.164***	−0.005	0.124***	0.009***
	(10.96)	(15.19)	(−1.28)	(7.20)	(5.74)
SIZE	0.000***	0.019***	0.012***	0.016***	0.001***
	(2.74)	(9.71)	(12.13)	(7.11)	(3.40)

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
LEVERAGE	0.000	−0.060***	−0.034***	−0.095***	−0.009***
	(0.43)	(−4.63)	(−9.47)	(−6.17)	(−4.51)
MTB	−0.000***	−0.001	−0.000	−0.004**	0.001
	(−5.18)	(−0.41)	(−0.36)	(−2.20)	(1.55)
ROA	0.008***	0.389***	0.129***	0.476***	0.066***
	(6.89)	(9.80)	(10.51)	(9.27)	(7.05)
CASH	0.001	−0.094***	0.005	−0.097***	0.000
	(1.54)	(−7.39)	(1.46)	(−5.97)	(0.05)
DIVIDENDS	−0.005	3.361***	0.136	5.062***	0.126
	(−0.58)	(6.79)	(0.96)	(8.67)	(1.50)
R&D	0.001	−0.020	0.048*	−0.136	0.025
	(0.22)	(−0.23)	(1.89)	(−1.40)	(1.40)
FOROPS	0.000***	0.049***	0.001	0.051***	0.002*
	(4.57)	(7.32)	(0.80)	(6.35)	(1.71)
ANALYSTS	0.000***	0.029***	0.002**	0.017***	0.002***
	(4.44)	(7.82)	(2.08)	(4.63)	(2.93)
OPTIONS	0.001	−0.176***	0.027*	−0.246***	−0.012*
	(0.66)	(−3.74)	(1.76)	(−3.80)	(−1.71)
S&P500	0.003***	0.261***	0.007	0.147***	0.011***
	(11.17)	(19.46)	(1.61)	(8.79)	(4.59)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,043	340,043	340,043	340,043	340,043
Adjusted R^2	0.036	0.200	0.024	0.273	0.014

Table 8: Institutional Trading and Buybacks

Column (1) shows that the intensity of buybacks (*BB_PCTOUT*) is stronger when institutions are selling rather than buying shares. Whereas the coefficient on *IOPCT_SELL* is positive (0.067) and statistically significant at the 1% level (*p*-value<0.001), the coefficient on *IOPCT_BUY* is not statistically different from zero (*p*-value=0.511). The results are similar in Column (2), where the dependent variable is the presence of buyback activity (*BB_ACTIVE*). The coefficient on *IOPCT_SELL* (3.010) is statistically different from zero at the 1% level (*p*-value<0.001). The coefficient on *IOPCT_BUY* is smaller (0.761) and is only marginally different from the 10% level (*p*-value=0.100). An *F*-test reveals that the coefficient on *IOPCT_SELL* is statistically larger than the coefficient on *IOPCT_BUY* in Columns (1) and (2).[28]

28. F-tests show that the coefficient on IOPCT_SELL is statistically larger than the coefficient on IOPCT_BUY in Column (1): F-statistic=5.01, p-value=0.029; Column (2): F-statistic=9.15, p-value=0.004; Column (3): F-statistic=4.50, p-value=0.038; and Column (4): F-statistic=10.91, p-value=0.002. The coefficients are not statistically different in Column (5): F-statistic=1.03; p-value=0.313.

Column (3) shows that institutional selling is marginally and positively related to announcements of a buyback plan (*BB_ANNOUNCE*). We find no similar relation with institutional buying. In Column (4), both institutional buying and selling are related to providing buyback updates. However, the coefficient on *IOPCT_SELL* is numerically (3.701 versus 1.643) and statistically (*p*-value=0.002) larger than the coefficient on *IOPCT_BUY*, which we interpret as evidence that managers provide more buyback updates when selling pressure is higher. Neither institutional buying nor selling are related to expansion of buyback programs in Column (5).

Key Takeaway 6: Managers increase stock buyback activity when institutional investors tend to be selling shares, which indicates that buybacks help stabilize markets.

6. Conclusion

We study the liquidity and volatility implications of corporate share buyback programs. Using a broad sample of over 10,000 firms across 17 years, we find strong evidence that firms strategically employ share repurchases to provide an important liquidity role similar to market-makers and a market stabilization role similar to investment bankers. We find strong evidence that share repurchases are associated with overall improvements in stock liquidity and attenuations in stock return volatility. We demonstrate how market improvements from buyback activities specifically benefit retail investors, which we estimate saved retail investors $2.1 to $4.2 billion in transaction and price impact costs during our sample period.

We also find that firms tend to strengthen buyback presence and intensity when institutional investor selling pressure is higher, which is the period when stock liquidity and volatility likely come under pressure. Firms also strengthen buyback activities when the market anticipates higher near-term stock-specific volatility and during spikes in overall economic policy uncertainty.

Taken together, our analyses demonstrate the beneficial impact of share repurchases on stock liquidity and volatility. These relations have important policy implications for contemporaneous discussions on buyback activity. Vocal opponents of stock buybacks have either introduced or threatened to introduce legislation to limit buyback activity. These legislative threats tend to demonize open market repurchase programs, which provide additional flexibility to managers wishing to return surplus capital to investors. Based on our findings, imposing limitations on stock buybacks will limit firms' ability to calm markets, supply liquidity, and reduce volatility during the most crucial periods of uncertainty. Such limitations would ultimately harm retail investors, who now account for approximately 20% of the average daily traded volume of equities in the U.S.

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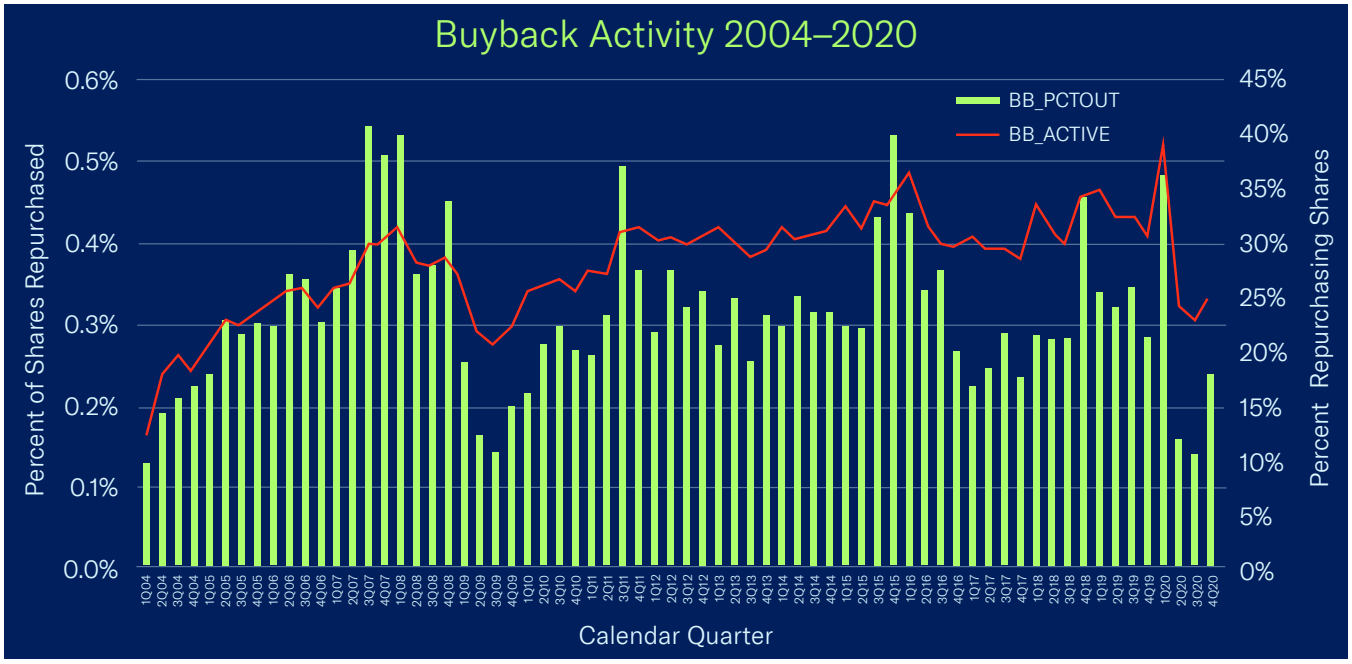
8. Appendix: Variable Definitions

Variable	Definition
Buyback Activity	
BB_PCTOUT	Number of shares repurchased during the quarter by the shares outstanding at the end of the prior quarter.
BB_ACTIVE	Equals 1 if a firm repurchases any shares during a quarter, and otherwise 0.
Buyback Disclosure	
BB_ANNOUNCE	Equals 1 if a firm reports event types 36, 152, or 232 in the CIQ-KD database, which correspond to the announcement of a new buyback program.
BB_UPDATE	Equals 1 if a firm reports event type 231 in the CIQ-KD database, which corresponds to buyback tranche updates of quarterly buyback amounts.
BB_EXPAND	Equals 1 if a firm reports event type 230 in the CIQ-KD database, which corresponds to expanded duration or size of existing buyback programs.
Liquidity	
ILLIQ	Absolute stock return divided by dollar trading volume.
SPREAD	Closing percentage quoted bid-ask spread is the closing ask less the closing bid divided by the midpoint of the closing ask and bid.
DVOLUME	Dollar volume is log transformed value of the stock price times the shares traded.
TURN	Stock turnover is the natural log of shares traded divided by shares outstanding.
ZERO	Percentage of trading days with zero stock returns.
Volatility	
RETVOL	Annualized standard deviation of daily stock returns over the quarter.
ARETVOL	Annualized standard deviation of daily abnormal stock returns over the quarter, where abnormal returns adjust for the returns of the CRSP value-weighted index.
IVOL	Average of the implied volatilities of the call and put contracts, which are closest to ATM and are one month to maturity (30 days).
Controls	
SIZE	Natural log of total assets.
LEVERAGE	Sum of long-term debt and long-term debt in current liabilities divided by total assets.
MTB	Market value of debt and equity divided by total assets.
ROA	Earnings before interest and taxes divided by total assets.
CASH	Cash and cash equivalents divided by total assets.
DIVIDENDS	Common dividends divided by earnings before interest, tax, depreciation, and amortization.
R&D	Research and development expense divided by total assets. Missing values are set to 0.
FOROPS	Foreign operations indicator equals 1 if the firm has a non-missing, non-zero value for pre-tax income from foreign operations during the fiscal year, and otherwise 0.
ANALYSTS	Number of analysts providing quarterly earnings per share estimates from the I/B/E/S adjusted summary file. We set missing values to zero.

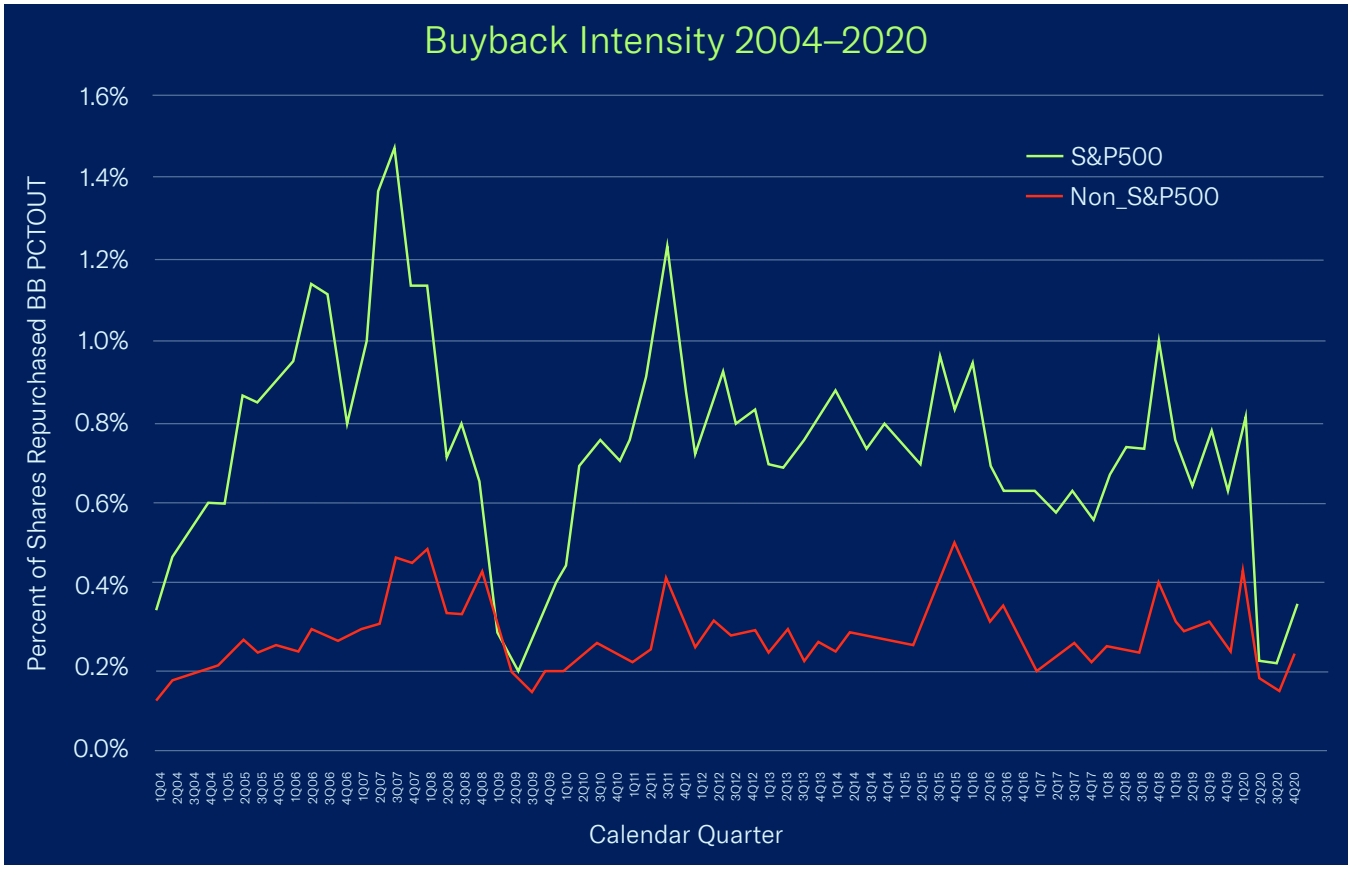
Variable	Definition
RANALYSTS	Residual number of analysts, which is analyst following (ANALYSTS) orthogonalized with respect to firm size (SIZE).
OPTIONS	Natural log of 1 plus the number of options granted divided by shares outstanding in the prior fiscal year.
S&P500	Equals 1 if the company is a member of the S&P500 index, and otherwise 0.
Other Measures	
HIEXPVOL	High expected volatility equals 1 if the firm has an above-median quarterly value of expected volatility, which we define as the ratio of the implied volatility on the 30-day ATM call and put stock option divided by the implied volatility on the 91-day ATM call and put stock options on the first day of each calendar-quarter, and otherwise 0.
EPU	Normalized index value of the volume of news articles discussing economic policy uncertainty from Baker et al. (2016).
IOPCT_SELL	Percentage of institutional shares sold divided by institutional ownership; 0 if missing.
IOPCT_BUY	Percentage of institutional shares bought divided by institutional ownership; 0 if missing.
IOPCT_OWN	Percentage of institutional shares owned divided by total shares outstanding; 0 if missing.

Figure 1. Buybacks Over Time



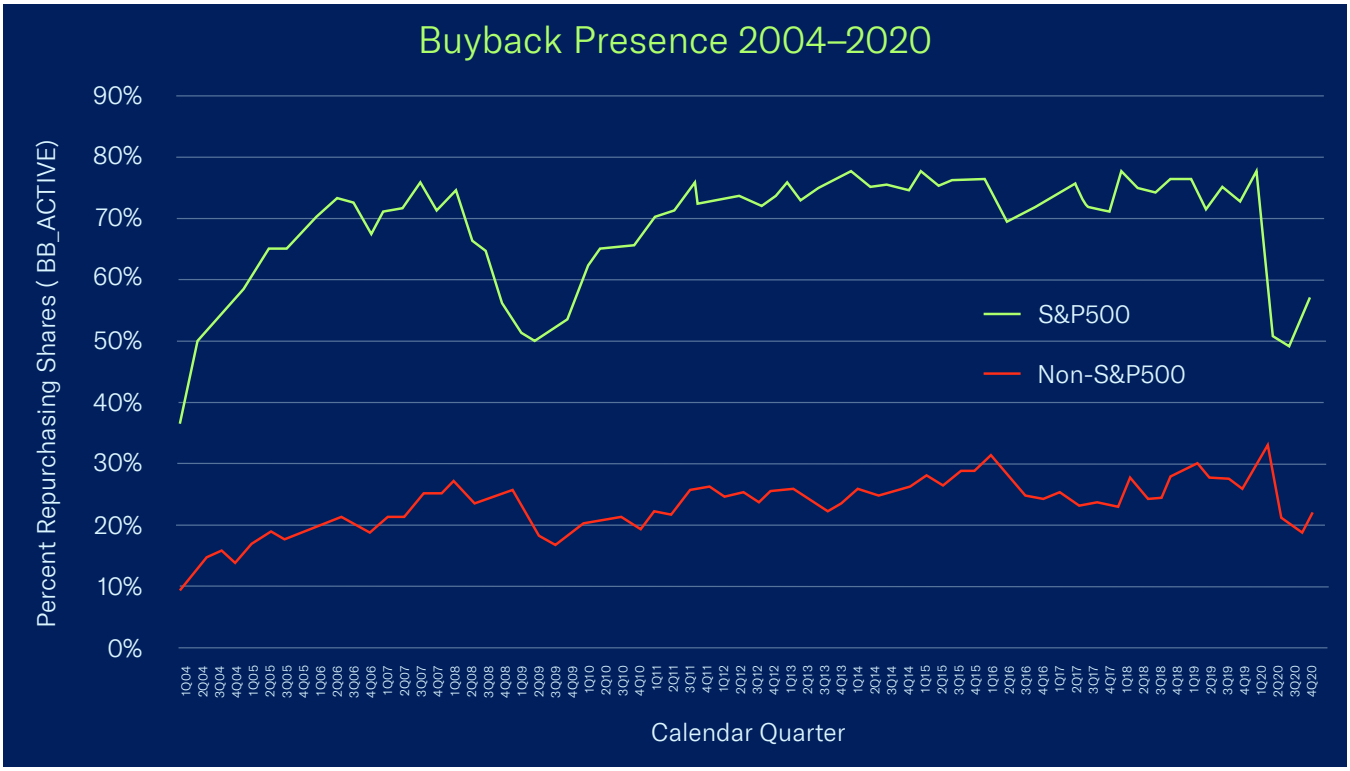
This figure plots time-series variation in buyback activity over calendar-quarters 1Q-04 to 4Q-20. The percentage of shares repurchased (*BB_PCTOUT*) is presented as black bars that correspond to values on the left y-axis. The percentage of firms repurchasing stock (*BB_ACTIVE*) is plotted as a gray dashed line with its scale on the right y-axis.

Figure 2. Share Buyback Intensity for S&P500 and Non-S&P500 Firms



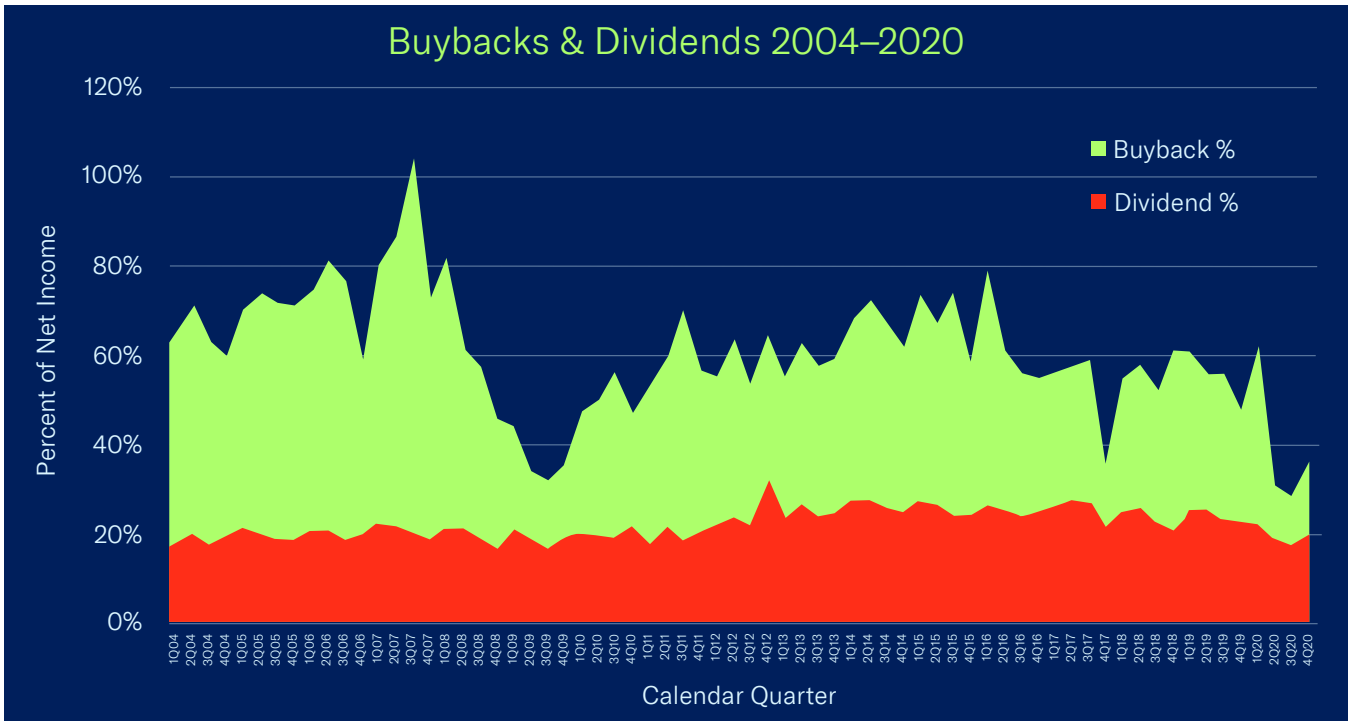
This figure plots time-series variation in buyback intensity based on S&P500 index membership. For each sample quarter, we separately calculate the average percentage of shares repurchased (*BB_PCTOUT*) for sample firms that are members of the S&P500 and those that are not. *BB_PCTOUT* is depicted by the black solid line for S&P500 constituents, and by the gray dashed line for non-S&P500 sample firms.

Figure 3. Share Buyback Presence for S&P500 and Non-S&P500 Firms



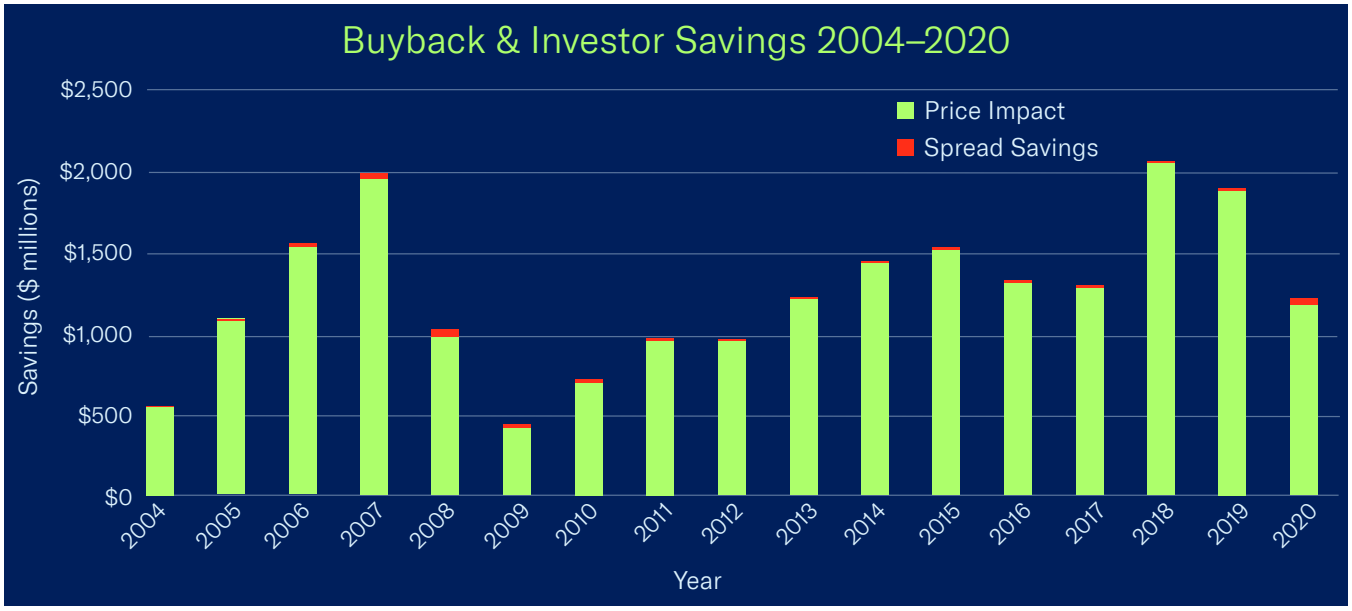
This figure plots time-series variation in buyback activity based on S&P500 index membership. For each sample quarter, we separately calculate the average percentage of firms repurchasing shares (*BB_ACTIVE*) for sample firms that are members of the S&P500 and those that are not. *BB_ACTIVE* is depicted by the black solid line for S&P500 constituents, and by the gray dashed line for non-S&P500 sample firms.

Figure 4. Payouts Over Time



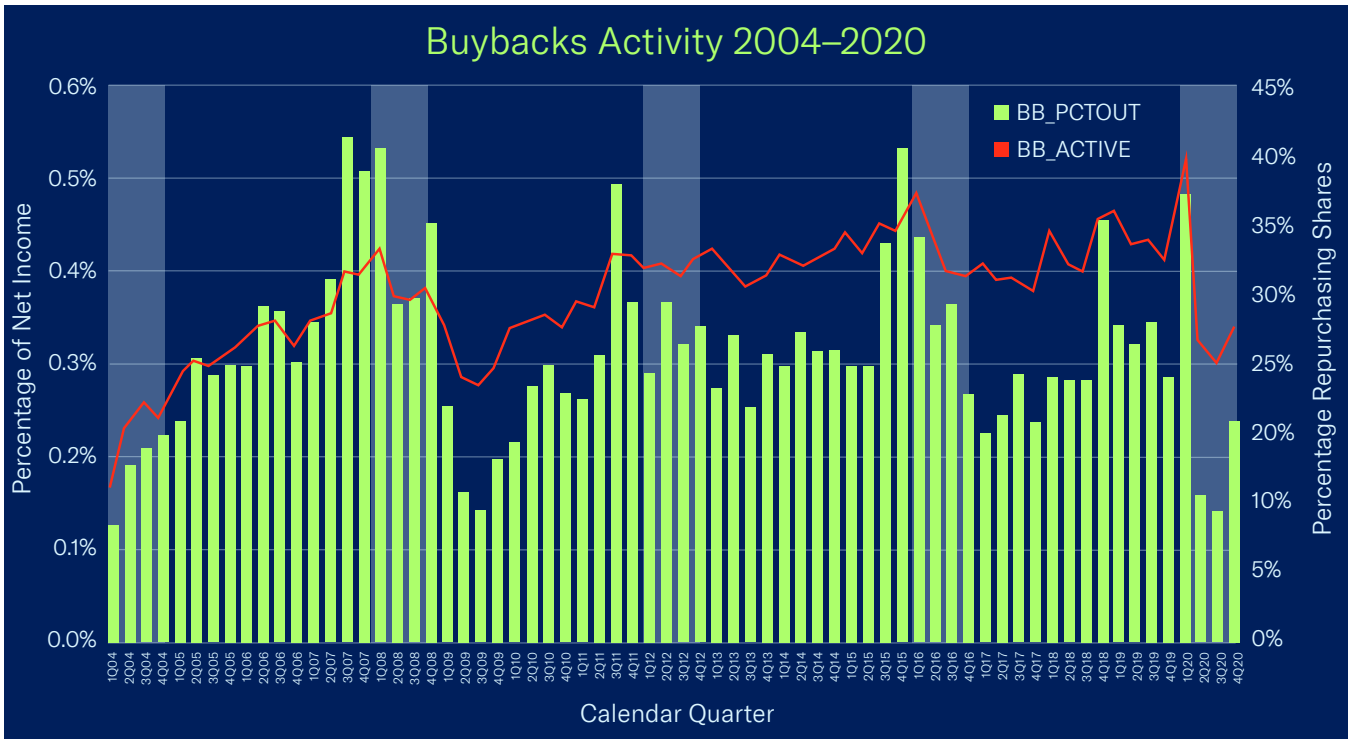
This figure plots time-series variation in payout statistics. For each sample quarter, we separately calculate dividends and buybacks as a percentage of net income. Dividend % is depicted by the area shaded in gray. Buyback % is represented by the area shaded in black.

Figure 5. Investor Benefits of Buybacks



This graph depicts the investor savings from buyback activity over 2004 to 2020. The graphs depict annual savings in terms of transaction costs via bid-ask spreads (*SPREAD SAVINGS*) charted in black bars and price impact savings (*PIS*) charted in gray bars.

Figure 6. Buybacks and U.S. Presidential Elections



This figure plots time-series variation in buyback activity over calendar-quarters 1Q-04 to 4Q-20. The percentage of shares repurchased (*BB_PCTOUT*) is presented as black bars that correspond to values on the left y-axis. The percentage of firms repurchasing stock (*BB_ACTIVE*) is plotted as a gray dashed line with its scale on the right y-axis. The gray shaded areas depict the U.S. presential election period, which begins with the first primary election in Q1 and ends with the election in Q4 during election years.

Table 1. Summary Statistics

	Mean	Median	Standard Deviation	Firm Quarters
Buyback Activity				
BB_PCTOUT	0.003	0.000	0.020	340,327
BB_PCTOUT (non-zero)	0.011	0.005	0.037	94,776
BB_PCTOUT (log-transformed)	0.003	0.000	0.013	340,327
BB_ACTIVE	0.278	0.000	0.448	340,327
Buyback Disclosure				
BB_ANNOUNCE	0.053	0.000	0.224	340,327
BB_UPDATE	0.267	0.000	0.442	340,327
BB_EXPAND	0.017	0.000	0.129	340,327
Stock Liquidity				
ILLIQ	0.191	0.001	0.955	340,327
SPREAD	0.009	0.002	0.018	340,327
DVOLUME ($ millions)	35.700	3.196	185.135	340,327
DVOLUME (log-transformed)	14.746	14.977	2.706	340,327
TURN	0.659	0.361	9.467	340,327
TURN (log-transformed)	–1.163	–1.019	1.192	340,327
ZERO	0.033	0.016	0.047	340,327
Volatility				
RETVOL	0.499	0.395	0.435	340,219
ARETVOL	0.467	0.362	0.430	340,219
IVOL	0.474	0.408	0.257	194,222
Firm Characteristics				
SIZE	6.637	6.630	2.223	340,327
LEVERAGE	0.227	0.170	0.227	340,327
MTB	1.597	1.082	1.761	340,327
ROA	–0.002	0.010	0.064	340,327
CASH	0.202	0.097	0.241	340,327
DIVIDENDS	0.003	0.000	0.006	340,327
R&D	0.013	0.000	0.031	340,327
FOROPS	0.370	0.000	0.483	340,327
ANALYSTS	4.640	2.000	6.200	340,327
RANALYSTS	0.002	–0.132	1.000	340,327
OPTIONS	0.011	0.001	0.028	340,327
S&P500	0.099	0.000	0.299	340,327
Uncertainty Measures				
HIEXPVOL	0.500	1.000	0.500	187,192
EPU	0.135	0.126	0.063	340,327

This table presents the mean, median, standard deviation, and sample observations of key variables. We define variables in the Appendix.

Table 2. Correlation Matrix

	BB_ PCTOUT	BB_ ACTIVE	ILLIQ	SPREAD	DVOLUME	TURN	ZERO	RETVOL	ARETVOL	IVOL
BB_ PCTOUT	1.0000									
BB_ ACTIVE	0.2502*	1.0000								
ILLIQ	–0.0172*	–0.0706*	1.0000							
SPREAD	–0.0360*	–0.1541*	0.6890*	1.0000						
DVOLUME	0.0770*	0.3016*	–0.3876*	-0.6155*	1.0000					
TURN	0.0448*	0.0839*	–0.3320*	-0.4554*	0.6867*	1.0000				
ZERO	–0.0363*	–0.1614*	0.2668*	0.4056*	–0.5408*	–0.3930*	1.0000			
RETVOL	–0.0354*	–0.1660*	0.2303*	0.4257*	–0.2224*	0.1500*	0.0987*	1.0000		
ARETVOL	–0.0400*	–0.1868*	0.2562*	0.4663*	–0.2765*	0.1072*	0.1480*	0.9891*	1.0000	
IVOL	–0.0624*	–0.2577*	0.0509*	0.4900*	–0.4382*	0.2240*	0.2244*	0.7447*	0.7431*	1.0000

This table presents a pairwise correlation matrix at the calendar-quarter level. The asterisk * denotes correlations are statistically different from zero at the 5% level or better. We define variables in the Appendix.

Table 3. Buybacks and Liquidity

	ILLIQ	*SPREAD*	*DVOLUME*	*TURN*	*ZERO*
Panel A: Intensity of buybacks					
BB_PCTOUT	–0.754***	–0.023***	5.959***	3.185***	–0.035***
	(–3.95)	(–4.77)	(8.99)	(7.44)	(–4.18)
SIZE	–0.160***	–0.005***	1.082***	0.246***	–0.011***
	(–11.60)	(–15.55)	(70.37)	(18.55)	(–26.19)
LEVERAGE	0.176***	0.005***	–0.651***	0.138***	0.014***
	(5.92)	(7.42)	(–11.31)	(3.46)	(10.69)
MTB	–0.050***	–0.001***	0.396***	0.065***	–0.005***
	(–7.98)	(–10.65)	(35.70)	(7.75)	(–20.45)
ROA	–0.319**	–0.025***	0.799***	–1.075***	–0.043***
	(–2.57)	(–8.95)	(2.74)	(–4.26)	(–5.59)
CASH	–0.253***	–0.006***	0.843***	0.709***	–0.005***
	(–6.77)	(–8.12)	(15.01)	(16.19)	(–3.43)
DIVIDENDS	–3.808***	–0.086***	3.198	–13.969***	–0.251***
	(–5.66)	(–6.27)	(1.61)	(–9.57)	(–7.65)
R&D	–1.588***	–0.035***	1.809***	0.297	–0.022*
	(–6.04)	(–7.66)	(4.28)	(0.85)	(–1.99)
FOROPS	–0.031***	–0.001***	0.190***	0.006	–0.003***
	(–2.75)	(–5.17)	(7.32)	(0.30)	(–5.59)
ANALYSTS	–0.001	–0.001***	0.431***	0.161***	–0.003***
	(–0.16)	(–6.79)	(27.77)	(16.44)	(–11.83)
OPTIONS	–0.629***	–0.016***	1.601***	1.458***	–0.035***
	(–3.43)	(–3.42)	(3.20)	(3.33)	(–3.88)
S&P500	0.338***	0.009***	0.141***	–0.330***	0.017***
	(11.73)	(15.31)	(3.30)	(–9.79)	(14.55)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,323	340,323	340,323	340,323	340,323
Adjusted R^2	0.120	0.320	0.792	0.292	0.277

	ILLIQ	*SPREAD*	*DVOLUME*	*TURN*	*ZERO*
			Panel B: Extent of buybacks		
BB_ACTIVE	–0.047***	–0.002***	0.242***	0.009	–0.003***
	(–5.35)	(–9.02)	(13.88)	(0.68)	(–7.59)
SIZE	–0.158***	–0.005***	1.076***	0.247***	–0.011***
	(–11.54)	(–15.47)	(70.06)	(18.51)	(–25.92)
LEVERAGE	0.173***	0.005***	–0.635***	0.139***	0.014***
	(5.84)	(7.33)	(–11.01)	(3.47)	(10.56)
MTB	–0.050***	–0.001***	0.395***	0.064***	–0.005***
	(–7.97)	(–10.64)	(35.74)	(7.67)	(–20.50)
ROA	–0.303**	–0.024***	0.734**	–1.050***	–0.042***
	(–2.43)	(–8.75)	(2.51)	(–4.15)	(–5.43)
CASH	–0.258***	–0.006***	0.870***	0.712***	–0.005***
	(–6.89)	(–8.33)	(15.45)	(16.12)	(–3.62)
DIVIDENDS	–3.660***	–0.081***	2.422	–14.028***	–0.243***
	(–5.43)	(–5.91)	(1.22)	(–9.61)	(–7.40)
R&D	–1.586***	–0.035***	1.806***	0.302	–0.022*
	(–6.04)	(–7.67)	(4.28)	(0.86)	(–1.98)
FOROPS	–0.029**	–0.001***	0.179***	0.008	–0.003***
	(–2.54)	(–4.84)	(6.96)	(0.37)	(–5.33)
ANALYSTS	0.001	–0.001***	0.422***	0.163***	–0.003***
	(0.33)	(–6.19)	(27.49)	(16.59)	(–11.42)
OPTIONS	–0.636***	–0.016***	1.643***	1.463***	–0.035***
	(–3.46)	(–3.45)	(3.24)	(3.33)	(–3.90)
S&P500	0.347***	0.010***	0.100**	–0.323***	0.017***
	(11.91)	(15.63)	(2.36)	(–9.68)	(15.10)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,323	340,323	340,323	340,323	340,323
Adjusted R^2	0.121	0.321	0.792	0.291	0.278

This table presents results from an OLS regression estimate of stock liquidity and buybacks. All regressions include industry (two-digit SIC) and time (calendar-quarter) fixed effects. *T*-statistics are presented in parentheses based on robust standard errors double clustered at the firm and calendar-quarter levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. We define variables in the Appendix.

Table 4. Buybacks and Volatility

	RETVOL	*ARETVOL*	*IVOL*	*RETVOL*	*ARETVOL*	*IVOL*
BB_PCTOUT	−0.632***	−0.626***	−0.658***			
	(−4.89)	(−5.01)	(−6.68)			
BB_ACTIVE				−0.050***	−0.053***	−0.037***
				(−14.21)	(−17.19)	(−14.76)
SIZE	−0.058***	−0.069***	−0.059***	−0.057***	−0.067***	−0.059***
	(−29.87)	(−27.50)	(−32.48)	(−29.55)	(−27.26)	(−32.08)
LEVERAGE	0.206***	0.211***	0.136***	0.203***	0.208***	0.133***
	(11.49)	(11.53)	(13.23)	(11.39)	(11.43)	(12.90)
MTB	−0.008***	−0.011***	−0.017***	−0.008***	−0.011***	−0.017***
	(−4.38)	(−5.33)	(−11.48)	(−4.34)	(−5.30)	(−11.44)
ROA	−1.347***	−1.329***	−1.126***	−1.328***	−1.308***	−1.105***
	(−20.37)	(−21.17)	(−23.04)	(−20.29)	(−21.05)	(−22.57)
CASH	0.036**	0.034**	0.131***	0.030**	0.028**	0.124***
	(2.43)	(2.45)	(12.41)	(2.08)	(2.06)	(11.98)
DIVIDENDS	−5.833***	−5.678***	−4.858***	−5.679***	−5.514***	−4.737***
	(−17.88)	(−17.95)	(−17.41)	(−17.56)	(−17.60)	(−17.00)
R&D	−0.754***	−0.789***	0.054	−0.753***	−0.787***	0.050
	(−5.92)	(−6.22)	(0.59)	(−5.93)	(−6.23)	(0.55)
FOROPS	−0.021***	−0.027***	−0.025***	−0.018***	−0.024***	−0.023***
	(−5.89)	(−7.39)	(−7.71)	(−5.18)	(−6.68)	(−7.20)
ANALYSTS	−0.009***	−0.011***	−0.015***	−0.007***	−0.009***	−0.014***
	(−5.15)	(−6.72)	(−10.86)	(−3.97)	(−5.44)	(−10.04)
OPTIONS	0.122***	0.106**	0.332**	0.114**	0.097**	0.324**
	(2.70)	(2.49)	(2.29)	(2.57)	(2.33)	(2.29)
S&P500	0.045***	0.059***	0.023***	0.055***	0.070***	0.030***
	(7.92)	(10.01)	(5.65)	(9.38)	(11.57)	(7.57)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,215	340,215	194,222	340,215	340,215	194,222
Adjusted R^2	0.332	0.322	0.605	0.334	0.324	0.608

This table presents results from an OLS regression estimate of stock and option volatility. All regressions include industry (two-digit SIC) and time (calendar-quarter) fixed effects. *t*-statistics are presented in parentheses based on robust standard errors double clustered at the firm and calendar-quarter levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. We define variables in the Appendix.

Table 5. Buybacks and Investor Savings

	Full Sample	Buyback Percent Quintiles				
		Q1	Q2	Q3	Q4	Q5
Panel A. Transaction Costs						
Spread Savings						
Average per day ($)	53.7	65.2	40.7	50.5	55.8	56.4
Average per quarter ($)	3,381	4,110	2,554	3,181	3,513	3,548
Total per year ($ millions)	18.8	4.6	2.8	3.5	3.9	4.0
Total all years ($ millions)	320.4	77.9	48.4	60.3	66.6	67.3
Panel A. Transaction Costs						
Price Impact Savings (PIS)						
Average per day ($)	13.09	1.70	7.04	13.16	17.64	25.94
Average per quarter ($)	3,554	3	118	1,458	4,760	11,431
Total per year ($ millions)	1,245	0.2	8.3	102.2	333.5	800.8
Total all years ($ millions)	21,164	3	141	1,737	5,670	13,614

This table presents summarized estimates of transaction cost and volatility savings for retail investors. Panel A estimates savings in the bid-ask spread (*SPREAD SAVINGS*) due to repurchase activity. Panel B estimates price impact savings (*PIS*) due to repurchase activity. We sort repurchasing firms into quintiles based on the percentage of shares repurchased (*BB_PCTOUT*) over the full sample. Firms in the lowest quintile (Q1) repurchase the smallest percentage of shares outstanding in a given quarter, while firms in the highest quintile (Q5) repurchase the largest percent of shares outstanding. The notation bps represents basis points. One basis point is equal to 0.001.

Table 6. Future Uncertainty and Buybacks

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
HIEXPVOL	0.002***	0.119***	0.017***	0.121***	0.012***
	(11.18)	(17.47)	(8.55)	(11.73)	(9.28)
SIZE	−0.000	0.006**	0.012***	0.005	−0.000
	(−1.39)	(2.02)	(8.60)	(1.54)	(−0.09)
LEVERAGE	0.001**	−0.046**	−0.035***	−0.098***	−0.008**
	(2.13)	(−2.50)	(−6.12)	(−4.59)	(−2.46)
MTB	−0.000***	−0.007***	−0.001	−0.014***	0.000
	(−8.89)	(−2.98)	(−1.63)	(−5.94)	(0.39)
ROA	0.019***	0.869***	0.256***	1.007***	0.147***
	(12.29)	(12.22)	(10.47)	(12.19)	(6.81)
CASH	0.002*	−0.124***	0.022***	−0.106***	0.005
	(1.77)	(−5.88)	(3.61)	(−3.87)	(1.23)
DIVIDENDS	−0.048***	1.281*	−0.212	2.968***	−0.060
	(−4.16)	(1.89)	(−1.09)	(4.30)	(−0.46)
R&D	0.008	−0.029	0.135***	−0.076	0.079*
	(1.62)	(−0.17)	(2.67)	(−0.41)	(1.90)
FOROPS	0.001***	0.064***	−0.001	0.062***	0.002
	(3.99)	(6.83)	(−0.44)	(5.79)	(1.27)
ANALYSTS	0.000***	0.041***	−0.000	0.025***	0.002***
	(7.22)	(10.59)	(−0.28)	(6.58)	(2.93)
OPTIONS	0.001	−0.202**	0.015	−0.347**	−0.008
	(0.54)	(−2.07)	(0.66)	(−2.45)	(−0.59)
S&P500	0.003***	0.237***	0.002	0.135***	0.008***
	(9.30)	(16.85)	(0.35)	(8.09)	(3.26)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	186,863	186,863	186,863	186,863	186,863
Adjusted R^2	0.049	0.195	0.024	0.286	0.016

This table presents results from an OLS regression estimate of the ratio of buyback activity and disclosures. The variable *HIEXPVOL* equals 1 if the ratio of the implied volatility on 30-day ATM stock options divided by the adjusted implied volatility on the 91-day ATM stock options on the first day of the quarter is above the sample median for each calendar-quarter. All regressions include industry (two-digit SIC) and time (calendar-quarter) fixed effects. *t*-statistics are presented in parentheses based on robust standard errors double clustered at the firm and calendar-quarter levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. We define variables in the Appendix.

Table 7. Political Uncertainty and Buybacks

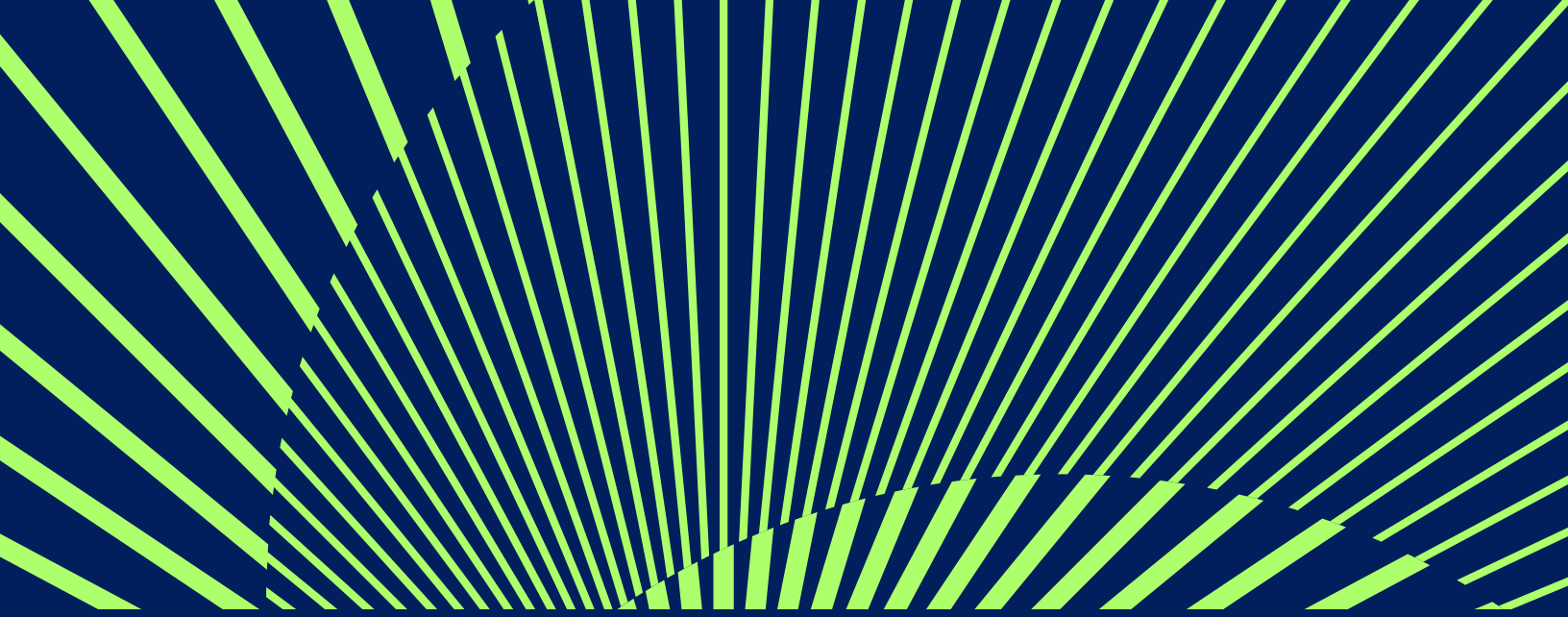
	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
EPU	−0.000	0.114***	−0.073***	1.136***	0.007
	(−0.34)	(5.72)	(−9.95)	(48.38)	(1.63)
SIZE	0.000**	0.059***	0.009***	0.119***	0.006***
	(2.24)	(17.95)	(9.46)	(27.68)	(10.43)
LEVERAGE	−0.001**	−0.062***	−0.046***	−0.041***	−0.011***
	(−2.01)	(−5.35)	(−12.26)	(−2.67)	(−4.23)
MTB	−0.000***	−0.004***	−0.002***	0.002*	0.000
	(−7.04)	(−3.15)	(−5.47)	(1.71)	(0.32)
ROA	0.004**	0.087***	0.091***	−0.276***	0.026***
	(2.30)	(3.19)	(8.89)	(−8.58)	(3.96)
CASH	−0.000	−0.001	0.012***	0.036**	0.005**
	(−0.18)	(−0.06)	(2.97)	(2.23)	(2.01)
DIVIDENDS	0.020***	2.827***	0.489***	6.417***	0.252***
	(2.65)	(9.14)	(3.07)	(15.29)	(2.83)
R&D	0.005*	0.381***	0.071***	0.513***	0.069***
	(1.89)	(6.18)	(3.45)	(6.91)	(4.86)
FOROPS	0.000	0.046***	−0.001	0.103***	0.003*
	(1.23)	(5.85)	(−0.22)	(10.07)	(1.79)
ANALYSTS	0.001***	0.041***	0.008***	0.074***	0.003***
	(6.71)	(10.87)	(5.54)	(15.78)	(3.20)
OPTIONS	0.000	−0.093***	0.012	−0.348***	−0.029***
	(0.32)	(−2.61)	(1.03)	(−3.52)	(−2.84)
S&P500	0.001***	0.075***	0.006	0.070***	0.009***
	(3.20)	(4.86)	(1.11)	(3.54)	(2.96)
Firm FE	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	No	No	No
Firm Quarters	340,043	340,043	340,043	340,043	340,043
Adjusted R^2	0.097	0.439	0.058	0.467	0.067

This table presents results from an OLS regression estimate of the ratio of buyback activity and disclosures. The variable EPU is the quarterly average value of the normalized index value of the volume of news articles discussing economic policy uncertainty from Baker et al. (2016). All regressions include firm fixed effects (which absorbs industry fixed effects), but do not include time fixed effects as these would absorb the EPU variable. t-statistics are presented in parentheses based on robust standard errors clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. We define variables in the Appendix.

Table 8. Institutional Trading and Buybacks

	BB_PCTOUT	*BB_ACTIVE*	*BB_ANNOUNCE*	*BB_UPDATE*	*BB_EXPAND*
IOPCT_SELL	0.067***	3.010***	0.706*	3.701***	0.358
	(3.93)	(5.60)	(1.99)	(9.43)	(1.29)
IOPCT_BUY	0.011	0.761*	−0.103	1.643***	0.018
	(0.66)	(1.67)	(−0.69)	(2.92)	(0.12)
IOPCT_OWN	0.002***	0.164***	−0.005	0.124***	0.009***
	(10.96)	(15.19)	(−1.28)	(7.20)	(5.74)
SIZE	0.000***	0.019***	0.012***	0.016***	0.001***
	(2.74)	(9.71)	(12.13)	(7.11)	(3.40)
LEVERAGE	0.000	−0.060***	−0.034***	−0.095***	−0.009***
	(0.43)	(−4.63)	(−9.47)	(−6.17)	(−4.51)
MTB	−0.000***	−0.001	−0.000	−0.004**	0.001
	(−5.18)	(−0.41)	(−0.36)	(−2.20)	(1.55)
ROA	0.008***	0.389***	0.129***	0.476***	0.066***
	(6.89)	(9.80)	(10.51)	(9.27)	(7.05)
CASH	0.001	−0.094***	0.005	−0.097***	0.000
	(1.54)	(−7.39)	(1.46)	(−5.97)	(0.05)
DIVIDENDS	−0.005	3.361***	0.136	5.062***	0.126
	(−0.58)	(6.79)	(0.96)	(8.67)	(1.50)
R&D	0.001	−0.020	0.048*	−0.136	0.025
	(0.22)	(−0.23)	(1.89)	(−1.40)	(1.40)
FOROPS	0.000***	0.049***	0.001	0.051***	0.002*
	(4.57)	(7.32)	(0.80)	(6.35)	(1.71)
ANALYSTS	0.000***	0.029***	0.002**	0.017***	0.002***
	(4.44)	(7.82)	(2.08)	(4.63)	(2.93)
OPTIONS	0.001	−0.176***	0.027*	−0.246***	−0.012*
	(0.66)	(−3.74)	(1.76)	(−3.80)	(−1.71)
S&P500	0.003***	0.261***	0.007	0.147***	0.011***
	(11.17)	(19.46)	(1.61)	(8.79)	(4.59)
Industry FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Firm Quarters	340,043	340,043	340,043	340,043	340,043
Adjusted R^2	0.036	0.200	0.024	0.273	0.014

This table presents results from an OLS regression estimate of the buyback activity and institutional trading. The variables *IOPCT_SELL*, *IOPCT_BUY,* and *IOPCT_OWN* represents the percentage of shares sold, bought, and owned by institutional investors during the quarter. All regressions include industry (two-digit SIC) and time (calendar-quarter) fixed effects. t-statistics are presented in parentheses based on robust standard errors double clustered at the firm and calendar-quarter levels. ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. We define variables in the Appendix.



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