Do Share Repurchases Increase the Value of Non-repurchasing Firms?*

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Abstract

Share repurchases have increasingly surpassed dividends as the primary means of distributing cash to investors. I show that most cash distributed through share repurchases ultimately flows back into the stock market, particularly into non-repurchasing firms. I provide evidence that these flows increase the value of non-repurchasing firms without subsequent reversals. The impact of share repurchase flows is most pronounced among non-repurchasing firms that share similar characteristics with repurchasing firms (e.g., size, market-to-book ratios). I find that the recent disproportionate increase in share repurchases by growth firms, relative to value firms, has contributed to the decline of the value premium. Inferences based on the fact that aggregate share repurchases are driven by a few large firms support a causal interpretation of the non-fundamental flow-based mechanism.

Keywords: Share repurchases, Buybacks, Flows, Inelastic markets, Value premium
JEL Classification: G1, G2

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Introduction

Since the late 1990s, share repurchases have replaced dividends as the primary mode of U.S. corporate payouts (Skinner, 2008; Farre-Mensa, Michaely, and Schmalz, 2014; Kahle and Stulz, 2021). Their popularity has grown dramatically over time, exceeding $1 trillion in 2023 alone. This structural shift in payout policy has raised concerns among the media and policymakers. Opponents of stock buybacks argue that repurchasing firms reduce long-term investments, such as R&D, and instead distribute cash to already-wealthy shareholders, enabling them to consume more.[1] However, where the cash distributed through share repurchases ultimately flows remains an open question. In this paper, I show that most of this cash distribution flows back into the stock market, specifically into non-repurchasing firms. I then demonstrate that these flows increase the value of non-repurchasing firms.[2]

To begin, I construct granular instrumental variables for aggregate share repurchases, following Gabaix and Koijen (2024a), to identify exogenous variations in share repurchases. I do so because the ideal setting for studying the price impact of share repurchase flows is when firms conduct buybacks for exogenous reasons. However, share repurchase decisions may convey information about the economy and financial markets.

For example, when many firms buy back shares at the same time, it may signal a lack of investment opportunities, a higher cost of capital (Gonçalves and Stathopoulos, 2024), or that the aggregate stock market is undervalued (Ma, 2019). In this case, firms' collective repurchase decisions serve as a fundamental signal of market-wide conditions. To isolate exogenous share repurchases, I construct granular instrumental variables (GIVs) for aggregate buybacks, leveraging the empirical fact that share repurchases are highly concentrated.

In the data, aggregate share repurchases are often driven by a few large firms with disproportionately large buybacks. For example, Apple alone has repurchased more than

[1] *New York Times,* September 10, 2021, Democrats Eye Taxing Stock Buybacks and Partnerships to Pay for Agenda, by Jonathan Weisman and Peter Eavis.

[2] The Inflation Reduction Act of 2022 imposed a one percent excise tax on share repurchases, and lawmakers are considering raising the tax rate to four percent. My paper suggests that the new tax could also affect the valuation of non-repurchasing firms.

\$500 billion of its shares over the past decade, accounting for more than 7% of all public firms' aggregate share repurchases. A key idea behind constructing a GIV for share repurchases is that a significant portion of Apple's buybacks occurs for firm-specific reasons, such as excess cash holdings. Importantly, Apple's idiosyncratic share repurchases are unlikely to be driven by market-wide shocks that systematically affect all firms' repurchase decisions. However, because Apple is extremely large, its idiosyncratic repurchases can still represent a substantial share of aggregate repurchases.

After constructing GIVs, I examine capital flows into the mutual fund sector around share repurchases. I focus on this sector because flows are directly observable in mutual funds and ETFs. I use quarterly mutual fund flows and Compustat share repurchase data from 1986 Q1 to 2023 Q4. The sample period begins in 1986, as open market share repurchases were almost nonexistent before then.

There are several reasons why cash distributed through share repurchases flows back into the stock market. Gabaix and Koijen (2024b) provide evidence that many investors exhibit rigid asset allocations (e.g., 80% equity and 20% bonds). As a result, share repurchase flows are likely to remain in the stock market. Booth (2023) argue that nearly 95% of the funds distributed through repurchases are reinvested in other stocks. This is because investors hold shares in repurchasing firms to earn the equity premium, and to continue earning it, they must remain invested in the stock market.

Consistent with these notions, I find that share repurchases lead to inflows into the mutual fund sector, but with a one-quarter lag. Specifically, share repurchases predict next-quarter flows into the mutual fund sector, especially among equity funds. In terms of economic magnitude, share repurchases amounting to 1% of total stock market value lead to 1–3% inflows into equity funds. Given that the mutual fund sector holds about 30-50% of the stock market, this finding suggests that most cash distributed through share repurchases ultimately returns to the stock market. Regarding bond funds and bank deposits, I find at best a weak relationship between share repurchases and inflows.

Why are investors slow to reinvest the proceeds from selling shares of repurchasing firms? Investor inertia in portfolio rebalancing—even among institutional investors—has been well documented in the literature, with several proposed explanations (Lynch, 1996; Gabaix and Laibson, 2001; Baker, Coval, and Stein, 2007a; Irani and Kim, 2023). Given this, slow portfolio rebalancing around share repurchases is perhaps not surprising.

In the cross-section, share repurchases generate disproportionately larger flows to non-repurchasing firms with characteristics similar to those of repurchasing firms. For example, when growth firms are the primary repurchasing firms, other growth firms receive share repurchase flows through inflows into mutual funds with growth styles. These results suggest that investors reinvest the proceeds from selling shares to repurchasing firms into similar firms, consistent with style investing (Barberis and Shleifer, 2003).

Contemporaneously, I find no economically or statistically significant relationship between share repurchases and flows when using GIVs. In contrast, without GIVs, a strong negative contemporaneous relationship emerges, suggesting that mutual fund outflows often coincide with widespread share repurchases by many firms.

One possible explanation is that outflows naturally provide liquidity for repurchasing firms by generating flow-induced stock sales. These trades appear to depress stock prices (Edmans, Goldstein, and Jiang, 2012), making shares cheaper and thereby triggering repurchases at more attractive prices. However, when using GIVs—which capture idiosyncratic repurchases by a few large firms—this negative relationship disappears entirely.

The muted contemporaneous negative relationship with GIVs suggests that their construction effectively removes repurchases driven by common factors, such as aggregate mutual fund outflows. Importantly, with or without GIVs, repurchases positively predict next-quarter flows, indicating that regardless of what drives them, distributed cash eventually returns to the stock market. This result highlights that even when aggregate share repurchases are driven by a handful of large firms, they still ultimately generate inflows into the mutual fund sector.

Next, I examine whether flows generated by share repurchases increase the stock market valuation. Given the evidence of subsequent inflows following share repurchases, I hypothesize that stock market returns will be higher in the quarter following large share repurchases.

Consistent with this prediction, aggregate share repurchases positively predict market returns in the next quarter. The economic magnitude is sizable: a one-percentage-point increase in share repurchase flows leads to a 6–7 percent increase in market returns in the following quarter. This magnitude aligns with estimates in the literature (Gabaix and Koijen, 2024b). The return predictability of share repurchases is robust to controls for well-known return predictors (Welch and Goyal, 2008) and to the use of GIVs. In addition, return predictability becomes stronger during periods of high share repurchase activity.

However, one may still be concerned about endogeneity, as share repurchase decisions reveal information about repurchasing firms. Specifically, signaling (Bhattacharya, 1979; Miller and Rock, 1985), agency problems (Jensen, 1986), and equity mispricing (Ikenberry, Lakonishok, and Vermaelen, 1995) also predict that the share prices of repurchasing firms will increase. Therefore, it is difficult to identify which channels drive the share price increases for repurchasing firms.

To address this concern, in addition to using GIVs, I apply a further identification strategy by examining the returns of non-repurchasing firms. This is important because flows from share repurchases are unlikely to be informed about non-repurchasing firms, especially when share repurchases by a few large firms drive the aggregate amount.

I find that the return predictability of repurchases is stronger among non-repurchasing firms. This result is consistent with the idea that investors are less likely to reinvest in repurchasing firms immediately after selling their shares. Instead, they are more likely to allocate the proceeds to non-repurchasing firms. The focus on non-repurchasing firms, along with the use of GIVs, strongly suggests that the price impact of share repurchase flows is likely causal.

Cross-sectional evidence shows that share repurchases increase the value of similar non-repurchasing firms, consistent with patterns observed in mutual fund flows. Specifically, non-repurchasing firms with characteristics similar to those of repurchasing firms (e.g., size, book-to-market ratios) experience higher realized returns following buybacks. I find that these style-aligned reinvestment flows ultimately affect the realized returns of risk factors such as HML and SMB.

For example, the dominance of share repurchases by growth firms over value firms in the post-2000 period contributed to the decline of the value premium, as the resulting flows disproportionately boosted the valuations of growth firms. Importantly, the results are robust to the use of GIVs and to constructing factors using only non-repurchasing firms.

Contemporaneously, there is a strong negative relationship between share repurchases and market or factor returns when GIVs are not used. This pattern suggests that firms, as a group, tend to repurchase shares more actively during market downturns. In the cross-section, when SMB returns are negative, small firms repurchase more than large firms. However, consistent with the evidence on mutual fund flows, this negative relationship disappears entirely when using GIVs. In fact, with GIVs, the relationship turns positive, although it remains statistically insignificant.

These results highlight that firms, as a group, behave as contrarian investors when repurchasing their shares—that is, they tend to buy back stock when the aggregate market declines. However, with GIVs—which are based on idiosyncratic repurchases by a small number of large firms—this systematic contrarian behavior is successfully removed. Taken together, the evidence strengthens the identification strategy using GIVs and supports a causal interpretation of the non-fundamental, flow-based mechanism.

One final concern remains regarding front-running. Specifically, some investors may be aware of the price impacts of share repurchases. These investors may expect that when certain firms repurchase shares, other similar firms will also buy back shares, mimicking their peers (Massa, Rehman, and Vermaelen, 2007). Since these investors anticipate price impacts for the mimicking firms, they may engage in front-running upon learning about share repurchases, thereby generating price impacts.

However, this alternative explanation is unlikely to account for the observed price impacts, as the return predictability of share repurchases remains strong even when firms that repurchase shares in the next period are excluded from the construction of the non-repurchasing firm portfolio with a perfect look-ahead bias.

One may wonder whether seasoned equity offerings (SEOs) would decrease the value of non-SEO firms. In principle, SEOs can have the opposite effects of share repurchases since SEOs can generate outflows if investors sell shares of non-SEO firms to fund the purchase of new shares. However, I do not find empirical evidence that SEOs decrease the value of non-SEO firms, even when many firms issue equity simultaneously.[3] There are two explanations for this finding. First, the dollar amount of SEOs is not large enough to impact the share prices of non-SEO firms, which tend to be larger than SEO firms. Second, mutual fund ownership is relatively low for SEO firms. Therefore, SEOs do not significantly contribute to mutual fund flows.

The closest papers to mine are Schmickler and Tremacoldi-Rossi (2022) and Hartzmark and Solomon (2024), both of which show that predictable dividend reinvestments generate price pressure in the stock market. Despite this evidence on dividends, no prior research has documented that non-fundamental flows stemming from share repurchases have a permanent price impact on non-repurchasing firms—particularly at the factor or market level. Importantly, over the past two decades, share repurchases have been significantly larger in magnitude than dividends and more volatile across market cycles (Kahle and Stulz, 2021). Their pro-cyclical and volatile nature may act as a catalyst for excess volatility (Shiller, 1981). My paper contributes to the literature by providing both time-series and cross-sectional evidence on how the structural shift in payout policy affects financial markets through the non-fundamental flow channel.

[3]The result differs from Baker and Wurgler (2000) since they find that equity issuance negatively predicts market returns. There are two reasons for the difference. First, I study short-term return predictability while they are interested in long-horizon return forecasts. Second, I use changes in equity issuance scaled by lagged total market value while they use the share of equity issues in total new equity and debt issues.

Related literature This paper joins the large literature on share repurchases, studying the motivations behind and information contents of share repurchases. Bhattacharya (1979), Miller and Rock (1985), and Grullon and Michaely (2004) show that share repurchase decisions signal firms' prospects. Jensen (1986) argues that share repurchases prevent management from investing in negative NPV projects by reducing the available resources. Stulz (1988) shows that management can use share repurchases to increase ownership of voting rights. Baker and Wurgler (2000), Ikenberry et al. (1995), Peyer and Vermaelen (2009), and Ma (2019) find evidence that share repurchases reveal information about mispricing. Almeida, Fos, and Kronlund (2016) and Wang, Yin, and Yu (2021) document real effects of share repurchases. Kahle (2002) finds evidence that firms buy back shares to offset the dilution caused by option exercises. Lin (2024) examine whether payouts lead to deposit flows. My paper shows that, with a one-quarter lag, cash from repurchases ultimately flows back into the stock market. Chen (2024) investigate stock-level evidence on repurchase-induced reinvestments. The key contribution of my paper is to establish the causal impact of share repurchases on non-repurchasing firms at the aggregate market and factor levels using granular instrumental variables.

This paper concerns price impacts at the well-diversified portfolio level, such as the aggregate stock market, risk factors, and industry portfolios. Deuskar and Johnson (2011) document flow-driven price impacts at the market level using data on trades and limit orders for S&P 500 futures. Da, Larrain, Sialm, and Tessada (2018) document that large flows into the stock market driven by financial advice generate significant price pressure at the market level in Chile. Parker, Schoar, and Sun (2020) show that mechanical rebalancing by target date funds affects market returns. Li, Pearson, and Zhang (2021) find that flows generated due to IPO regulations have aggregate price impacts in the Chinese stock market. Hartzmark and Solomon (2024) and Schmickler and Tremacoldi-Rossi (2022) show that dividend reinvestment generates price pressure in the stock market. Finally, the factor-level evidence includes Li (2022), Peng and Wang (2021), and Ben-David, Li, Rossi, and

Song (2022). Gabaix and Koijen (2024b) develop a theoretical and empirical framework for analyzing the aggregate price impacts of uninformed flows. Gabaix and Koijen (2024a) introduce the construction of granular instrumental variables, with one application being their use in estimating the price multiplier in the aggregate stock market.

Several papers examine the aggregate effects on other asset classes, such as fixed income securities (Lou, Yan, and Zhang, 2013; D'Amico and King, 2013; Greenwood and Hanson, 2013; Greenwood and Vayanos, 2014; Vayanos and Vila, 2021; Ma, Xiao, and Zeng, 2022), mortgage-backed securities (Gabaix, Krishnamurthy, and Vigneron, 2007), and options (Garleanu, Pedersen, and Poteshman, 2008).

My paper is related to the limits of arbitrage literature (Shleifer and Vishny, 1997; Vayanos and Gromb, 2010). There may be too few "macro arbitrageurs" who trade actively across asset classes. For example, hedge funds did not provide elasticity to the stock market during the dot-com bubble (Brunnermeier and Nagel, 2004) and the global financial crisis (Ben-David, Franzoni, and Moussawi, 2012). My work is also related to the slow moving capital literature (Pedersen, Mitchell, and Pulvino, 2007; Duffie, 2010). Greenwood, Hanson, and Liao (2018) show that capital moves slowly across asset classes in partially segmented markets.

The paper proceeds as follows. Section 1 describes the data. Section 2 explains the construction of granular instrumental variables. Section 3 presents evidence of the price impact of flows generated by share repurchases. Section 4 provides cross-sectional evidence of the price impact at the factor level. Section 5 concludes.

1 Data

I obtain firm-level data from Compustat and CRSP. I include ordinary common shares (CRSP share codes 10 or 11) traded on the NYSE, AMEX, or NASDAQ (CRSP exchange codes 1, 2, or 3). The sample period spans from 1986 to 2023. I define quarterly net share repurchases as the purchase of common and preferred stock (PRSTKC) minus the sale of common and preferred stock (SSTK), setting negative values to zero following Kahle and Stulz (2021). Quarterly mutual fund flow data come from CRSP, and mutual fund holdings data are from Thomson Reuters. Deposit flows are from the Federal Reserve's Financial Accounts of the United States (FAUS).[4] The Fama-French 3-factor model (Fama and French, 1993) factors are from Professor Kenneth French's website: `https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/`, and return predictor variables are from Professor Amit Goyal's website: `https://sites.google.com/view/agoyal145`.

Figure 1 presents the evolution of share repurchases. Panel (a) shows that the dollar amount of share repurchases began increasing dramatically in the early 2000s. Before 2000, share issuance was comparable in size to share repurchases. However, since 2000, repurchases have consistently exceeded issuance, with the gap widening over time. After 2020, quarterly share repurchases often surpassed $200 billion.

A notable feature of share repurchases is their high volatility and pro-cyclicality. For example, repurchases rose sharply from 2002 to 2007 and then declined during the global financial crisis. A similar pattern occurred between 2010 and 2019, followed by a sharp drop during the COVID-19. This highly fluctuating nature contrasts with dividends, which tend to be smoothed over time (Brav, Graham, Harvey, and Michaely, 2005).

Panel (b) shows that share repurchases account for up to 1% of total stock market capitalization. Since 2000, quarterly repurchases have represented at least 0.5% of total market value nearly all the time. The declining importance of share issuance becomes more evident when viewed as a percentage of total market value. The only exceptions where issuance exceeded repurchases occurred during the global financial crisis, highlighting that share issuance tends to be counter-cyclical.

Panel (c) reports the fraction of repurchasing firms among all public firms. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are

[4] Following Lin (2024), deposit flows are defined as the sum of flows of checkable deposits, currency, and time and savings deposits held by households and nonprofit organizations, scaled by lagged deposits.

classified as non-repurchasing firms. The fraction of repurchasing firms has steadily increased from about 20% in the late 1980s to 50% after 2020, indicating their growing popularity as a means of distributing cash to investors.

Panel (d) shows that, in terms of market value, repurchasing firms account for over 50% of total stock market capitalization. The market share of repurchasing firms has steadily risen, peaking at nearly 80% in 2023. The difference between panel (c) (equal-weighted) and panel (d) (value-weighted) indicates that repurchasing firms tend to be larger, on average.

Table 1 presents summary statistics for the quarterly firm-level panel data. Panel A reports statistics for all firms, Panel B for repurchasing firms, and Panel C for non-repurchasing firms.

Consistent with Kahle and Stulz (2021), repurchasing firms are larger, older, and have higher operating cash flows than non-repurchasing firms. In contrast, repurchasing firms hold less cash on average. They also spend less on R&D, while their capital expenditures are similar to those of non-repurchasing firms. This pattern is consistent with the view that repurchasing firms are more mature and established, and therefore have less need for aggressive investment, allowing them to return a larger share of cash flow to investors.

In line with this interpretation, repurchasing firms also exhibit lower valuation ratios, as reflected in their Tobin's q. Finally, both groups have similar leverage levels.

2 Constructing Granular Instrumental Variables

I begin by constructing granular instrumental variables (GIVs) for aggregate share repurchases, following Gabaix and Koijen (2024a). The purpose of using GIVs is to exploit plausibly exogenous variations in share repurchases and to study whether flows generate any price impact in the stock market, even when they do not contain information about the economy or financial markets.

Without instruments, share repurchases are likely to reflect information about the state of the economy and financial markets. For example, when many firms choose to buy back shares instead of investing their cash holdings in R&D, it may indicate a lack of profitable investment opportunities in the economy. Alternatively, it may suggest that the aggregate stock market is undervalued, allowing firms to repurchase shares at abnormally low prices—possibly by increasing their borrowing (Ma, 2019).

To address endogeneity, I exploit the highly concentrated nature of share repurchases and construct GIVs by extracting the idiosyncratic components of share repurchases from large firms.

Table 2 shows the highly concentrated nature of share repurchases for the year 2015 as an example. In 2015, Apple Inc. alone repurchased $36 billion worth of shares, accounting for more than 7% of the aggregate share repurchases. The sum of the top 10 firms' stock buybacks yields nearly a quarter of total share repurchases. Importantly, the concentrated nature of share repurchases in 2015 is not an exception but the norm. For example, Apple has repurchased more than $500 billion worth of its shares in the past decade.

The key idea of constructing a GIV is that a large fraction of Apple's share repurchases can occur for its own idiosyncratic reasons, such as its excess cash holdings. Importantly, Apple's idiosyncratic components of share repurchases are unlikely to be related to market-wide valuation that systematically affects the share repurchase decisions of all firms. Despite the firm-level motivation, Apple's idiosyncratic components of share repurchases can account for a large share of aggregate share repurchases since Apple is extremely large.

Based on this idea, the GIV is defined as the sum of idiosyncratic share repurchases primarily from a few large firms. This instrument is unlikely to contain information on market-wide conditions since it is driven by a handful of large firms' idiosyncratic actions. However, since these firms are extremely large, idiosyncratic shocks to their share repurchases do not get diversified away and thus can explain variation in aggregate share repurchases across time.

To isolate the idiosyncratic components of share repurchases, I follow the methodology proposed by Gabaix and Koijen (2024a) and run the following quarterly panel regression with pseudo-equal value weights:[5]

$$s_{i,t} = f_i + q_t + \phi_1 \cdot s_{i,t-1} + \phi_2 \cdot s_{i,t-2} + \beta' \cdot c_{i,t} + u_{i,t}, \tag{1}$$

where $s_{i,t}$ is firm i net share repurchases at time t scaled by lagged market capitalization, f_i is firm fixed effects, q_t is time fixed effects, β is a vector of coefficients, $c_{i,t}$ is a vector of firm-level controls following the specification in Kahle and Stulz (2021), and $u_{i,t}$ is residuals. With estimated residuals $\hat{u}_{i,t}$, I construct the GIV:

$$\text{GIV}_t = \sum_{i=1}^{N} S_{i,t-1} \hat{u}_{i,t} - \frac{1}{N} \sum_{i=1}^{N} \hat{u}_{i,t}, \tag{2}$$

where $S_{i,t-1}$ represents lagged value weights based on market capitalization, and N is the number of firms. In other words, GIVs are the share-weighted average of residuals subtracted by their equal-weighted average.

As one might naturally wonder, the estimated residuals likely contain both idiosyncratic components of repurchases and missing systematic components due to omitted variables. To address this concern, I take a statistical approach. Specifically, following the remedy proposed by Gabaix and Koijen (2024a), I extract the principal components of $\hat{u}_{i,t}$ and construct latent PCA factors for share repurchases. The idea is to use a data-driven approach to capture as many latent systematic structures in repurchases as possible. With these latent factors, I aim to control for additional missing systematic components of share repurchases.

In analyses with GIVs, I report results both with and without PCA factor controls. In the main specification, I include three principal components (PCs) as controls. However, I confirm that the results are not sensitive to the number of PCs included.

[5] I define pseudo-equal value weights as $w_{i,t-1} = \frac{\sigma_{i,t-1}^{-2}}{\sum_k \sigma_{k,t-1}^{-2}}$, where $\sigma_{i,t-1}$ is the standard deviation of share repurchases in the previous 12 quarters.

3 Do Flows Generated by Share Repurchases Increase the Value of Non-repurchasing Firms?

In this section, I examine flows and stock market returns around share repurchases, using GIVs as the main independent variable. In all analyses, I first present evidence based on share repurchases without instruments. Specifically, I estimate an innovation ($\hat{\epsilon}_t$) in share repurchases using the following specification:

$$s_t = c + \phi_1 \cdot s_{t-1} + \phi_2 \cdot s_{t-2} + \epsilon_t, \tag{3}$$

where s_t represents net share repurchases scaled by lagged total stock market capitalization. The specification in Equation 3 aligns with that in Equation 1, as both control for lags of repurchases up to two quarters prior. The use of innovations helps control for anticipated components of share repurchases (Gabaix and Koijen, 2024b).[6] Almeida, Huang, and Xuan (2024) show that share repurchases are persistent over time, especially in the recent period. While repurchases are generally considered more flexible than dividends, this persistence suggests they may be becoming less flexible over time.

3.1 Flows Around Share Repurchases

To examine where cash distributed through share repurchases ultimately flows, I analyze mutual fund flows around repurchases. Mutual funds and ETFs provide a useful setting for this analysis because their fund flows are directly observable. I separately investigate flows to all mutual funds and ETFs, equity funds, bond funds, active funds, and passive funds.[7] Quarterly fund flows are defined as:

[6] The results are robust to the number of lags used to estimate innovations.

[7] I define mutual funds and ETFs as equity funds if their CRSP objective codes start with "E" or "M". The latter captures balanced funds, which I classify as equity funds because they typically have a high allocation to stocks. Bond funds are those with CRSP objective codes starting with "I". Passive funds are those with non-missing index_fund_flag variables, while the remaining funds are classified as active funds.

$$f_t = \frac{TNA_t - TNA_{t-1} \cdot (1 + ret_t)}{TNA_{t-1}}, \tag{4}$$

where TNA_t denotes total net assets, and ret_t represents fund returns. Flows are aggregated at the fund category level (e.g., equity fund flows) and converted into a time series using lagged TNA as weights. Since fund flows are persistent, I estimate innovations in flows using lagged flows of up to two quarters, following Equations 1 and 3. Additionally, I construct flows to bank deposits following Lin (2024).

I first examine the contemporaneous relationship between aggregate share repurchases and flows in Table 3. All results are based on time series regressions covering the sample period from 1986 Q1 to 2023 Q4.

First, I do not find a consistently strong relationship between share repurchases and deposit flows. Overall, the correlation is weakly positive. It becomes slightly stronger—though still statistically insignificant—during periods of high repurchase activity, defined as times when aggregate repurchases scaled by total market capitalization are higher than in other sample periods (Panel B). Lin (2024) find that deposit flows and payouts are highly correlated contemporaneously. One possible reason for this discrepancy is that Lin combines share repurchases and dividends, whereas I examine only repurchases. Another possibility is that I focus on innovations in share repurchase flows, while Lin examines flows that include persistent components of repurchases.

Second, the top table in Panel A shows that large share repurchases often coincide with outflows from the mutual fund sector. Across all asset classes, there is a strong negative contemporaneous relationship between repurchases and flows. Interestingly, this relationship is particularly pronounced among passive funds. One possible explanation is that outflows naturally provide liquidity for repurchasing firms by generating flow-induced stock sales. Another possibility is that these flow-induced trades depress stock prices (Edmans et al., 2012), making them cheaper and thereby triggering repurchases at more attractive prices.

Panels B and C show that this negative relationship persists in both high- and low-repurchase periods. I classify a quarter as a high-repurchase period if aggregate net repurchases, scaled by lagged market capitalization, exceed the sample median.[8] At first glance, the results suggest that cash from share repurchases flows out of the stock market.

However, when using GIVs, a completely different picture emerges. In all cases except for passive flows, the negative contemporaneous relationship disappears entirely in the full sample. The negative relationship for passive flows appears to originate from periods of low repurchase activity (Panel C), as the magnitude of the coefficient is five times larger than that estimated during periods of high repurchase activity (Panel B). During high repurchase periods, if anything, there tends to be a positive contemporaneous relationship between GIVs and mutual fund flows.

These muted results with GIVs suggest that their construction effectively removes the systematic components of share repurchases—namely, those related to aggregate mutual fund outflows. Put differently, if mutual fund outflows systematically triggered repurchases across many firms, GIVs would strip out this component. As a result, the negative relationship between repurchases and flows should disappear.

While these findings underscore the effectiveness of the GIV construction, they also suggest that idiosyncratic repurchases by large firms do not generate inflows into the mutual fund sector. If they did, we would expect to observe a positive relationship between repurchases and flows when using GIVs. However, I find no such evidence. This implies that cash distributed through share repurchases tends to remain in investors' pockets.

Earlier results also reveal little relationship between repurchases and deposit flows, pointing to two possible explanations. First, investors may increase their consumption immediately upon receiving repurchase proceeds. Second, they may rebalance their portfolios with a delay. Unlike dividends, repurchases are less visible to investors. In most cases, investors are unaware that firms are buying back their shares, meaning that sellers typically act for their own reasons—such as portfolio rebalancing—rather than in response to repurchase activity.

[8]When using GIVs, I use GIVs themselves to split periods to capture high repurchase activity driven by a few large firms.

As a result, it is unlikely that repurchases lead to immediate consumption (Baker, Nagel, Wurgler, Poterba, and Slemrod, 2007b).

I therefore examine the alternative possibility: that investors reinvest repurchase proceeds with a delay. Specifically, in Table 4, I test whether share repurchases predict mutual fund and ETF flows in the following quarter. As in Table 3, Panel A reports results for the full sample, Panel B for periods of high repurchase activity, and Panel C for periods of low repurchase activity.

First, I again find no meaningful relationship between repurchases and deposit flows. Across the full sample, as well as during periods of high and low repurchase activity, the relationship—both with and without GIVs—remains mixed and lacks a consistent pattern.

Second, Panel A shows that share repurchases predict inflows to mutual funds in the following quarter. Notably, the predictive power is concentrated in equity funds, with no significant effect on bond fund flows. Within equity funds, both active and passive funds experience inflows, with the effect being economically stronger for passive funds. The economic magnitudes are sizable: a 1% increase in share repurchases leads to a 2–3% increase in fund flows. Since the mutual fund sector owns about 30–50% of the stock market, this implies that nearly the entire dollar amount of share repurchases translates into inflows to the stock market.

Panels B and C show that share repurchases generate inflows to the mutual fund sector during both high and low repurchase activity periods. However, Panel C reveals that the effects are economically much stronger during periods of low repurchase activity. This result is perhaps not surprising, as these periods typically correspond to earlier years in the sample when mutual funds held a smaller share of the overall stock market. As a result, a given dollar amount of share repurchases represented a larger percentage inflow to mutual funds. This pattern is especially pronounced for passive funds, whose ownership was minimal in the earlier part of the sample.

Panel A also shows that with GIVs, I find a statistically significant relationship only when examining flows to all funds and passive funds. However, Panel B shows that when focusing on periods of high repurchase activity, GIVs predict flows to equity funds, and the results are both economically and statistically meaningful. Interestingly, in Table 3, all results with GIVs disappeared when examining the relationship between repurchases and contemporaneous flows. However, the results look completely different when considering future flows: with and without instruments, share repurchases predict next quarter's flows to equity funds.

The combined evidence suggests that regardless of the source of share repurchases—whether from many firms simultaneously or from a handful of large firms—when aggregate share repurchases are large, they translate into inflows to the stock market. The absence of meaningful results among bond funds aligns with expectations, as investors are likely to reinvest the proceeds from selling shares back into the stock market. One reason for this behavior is that investors tend to maintain rigid asset allocations (Gabaix and Koijen, 2024b). For example, most equity mutual funds must invest nearly 100% in the stock market with very little flexibility, regardless of changes in market conditions.

Booth (2023) argue that since investors invest in stocks to earn the equity premium, they are likely to reinvest proceeds from selling shares to repurchasing firms into other stocks. They estimate that investors reinvest nearly 95% of these proceeds into the stock market.

Why are investors slow to reinvest their proceeds? This behavior is perhaps not surprising given the existing literature. Investor inertia—even among institutional investors—has been well documented, and several studies seek to understand its underlying causes (Lynch, 1996; Gabaix and Laibson, 2001; Baker et al., 2007a; Irani and Kim, 2023). In Appendix A, I develop a model in which investors exhibit inertia in portfolio rebalancing. The model's price impact dynamics, driven by delayed reinvestment, align with observed trading patterns and the empirical evidence on price impacts presented in the next section.

3.2 Price Impacts of Flows Generated by Share Repurchases

The previous results show that share repurchases generate inflows to the stock market with a one-quarter lag, regardless of whether GIVs are used. This suggests that, irrespective of the source—whether repurchases are driven by many firms or a few large ones—they ultimately lead to net inflows into the stock market.

In contrast, the contemporaneous relationship reveals a different pattern. Analyses without instruments show a strong negative contemporaneous relationship between repurchases and flows, whereas this relationship disappears when using GIVs.

In this section, I examine how these flow patterns relate to realized stock market returns, as reported in Table 5. The sample covers 152 quarters, from 1986:Q1 to 2023:Q4.

I construct three versions of the aggregate market portfolio: one using all firms, a second using only repurchasing firms, and a third using only non-repurchasing firms. All portfolios are value-weighted. For the portfolios of all firms and non-repurchasing firms, I use lagged market capitalization as weights. For the portfolio of repurchasing firms, weights are based on net repurchase amounts. The results are similar when using lagged market capitalization instead. I use net repurchases as weights in the main specification to account for the possibility that firms buying back larger dollar amounts of shares may experience greater price impact.

Panel A presents results using the market portfolio constructed from all firms. The first two columns show a strong contemporaneous relationship between market returns and aggregate share repurchases when not using instruments. The second column shows that the results are robust to the inclusion of standard controls, including the dividend-to-price ratio, earnings-to-price ratio, book-to-market ratio, term spread, and credit spread.

However, when using GIVs, the negative relationship disappears entirely. If anything, the relationship between GIVs and contemporaneous market returns turns positive. Although this relationship is not statistically significant, the economic magnitude is sizable: a coefficient of 3 implies that a one-percent increase in repurchases (as a share of total market value) is associated with a 3-percent increase in market returns. These results remain consistent when including the same controls as well as three latent PCA factors.

At first glance, the results without instruments may suggest that share repurchases decrease prices—an initially surprising finding, as one would typically expect the opposite: repurchases should exert buying pressure on the shares of repurchasing firms. However, this seemingly puzzling relationship disappears when using GIVs. Importantly, these findings closely mirror the earlier relationship between repurchases and mutual fund flows documented in Table 3.

The evidence suggests that during periods of systematic outflows from the mutual fund sector, the aggregate market tends to decline, and firms respond by repurchasing shares—possibly because they view falling prices, driven by flow-induced selling pressure, as attractive buying opportunities. In this sense, firms behave like contrarian investors when trading their own shares.

Once GIVs are used, the negative correlations with both flows and market returns disappear. This indicates that GIVs effectively remove the systematic, contrarian component of repurchase activity. In other words, share repurchases tend to coincide with systematic outflows and declining market returns because many firms repurchase shares in response to worsening market conditions. However, when repurchases are concentrated among a few firms engaging in idiosyncratic buybacks, these systematic patterns are no longer observed.

Next, I examine the relationship between market returns and past flows. Consistent with the evidence of next-quarter inflows to equity funds in Table 4, share repurchases strongly predict next-quarter market returns. The estimated economic magnitude is sizable: a one-percent increase in share repurchases is associated with nearly a 14-percent increase in market returns. This implies a price multiplier of approximately 14, which exceeds typical macro price multiplier estimates in the literature.[9]

I interpret this multiplier as an upper bound due to the likely underestimation of share

[9] For a comprehensive review of price multiplier estimates, see Gabaix and Koijen (2024b).

repurchases in Compustat. Lin (2024) document that Compustat-based payout measures are consistently lower than those reported in the Federal Reserve's Financial Accounts of the United States (FAUS), with the discrepancy more pronounced for share repurchases than for dividends. For example, in 2007, FAUS reports nearly twice the payout amount recorded in Compustat. Adjusting for this difference would reduce the implied price multiplier to around 6–7, bringing it closer to previous estimates.

Despite this limitation, I rely on Compustat-based repurchase data because it enables analysis at the firm level. Column (6) further shows that the result becomes even stronger with the inclusion of controls, suggesting that the predictive power of repurchases is not subsumed by standard return predictors documented in the literature.

Finally, and most importantly, the last two columns of Table 5 show that GIVs positively predict next-quarter market returns, with results that are both statistically and economically significant. Notably, the economic magnitude of return predictability is slightly lower when using GIVs, suggesting that other channels may also contribute to forecasting market returns. For example, it is possible that part of the predictability arises because repurchases by many firms serve as a signal of market-level undervaluation (Ma, 2019). The pattern of contemporaneously low returns followed by high returns in specifications without instruments is consistent with this mispricing mechanism. The attenuated magnitude with instruments supports the interpretation that the constructed GIVs act as valid instruments by addressing affirmative endogeneity concerns (Jiang, 2017).

Taken together, the consistently strong return predictability using GIVs, along with the earlier finding that GIVs predict future fund flows (Table 4), suggests that even when a small number of firms with unusually large repurchases are the primary contributors to aggregate share repurchases, their size alone is sufficient to generate inflows into the stock market and, in turn, predict future returns—even if these repurchases do not convey information about the aggregate stock market.

In Panels B and C, the market portfolios are constructed using repurchasing firms and non-repurchasing firms, respectively. The results are generally stronger among non-repurchasing firms, particularly in terms of return predictability. This pattern further strengthens the identification strategy, as share repurchases are especially unlikely to convey information about non-repurchasing firms. The case for exogeneity becomes even more compelling with GIVs, since a few large firms' idiosyncratic buybacks are particularly unlikely to reflect information relevant to the broader group of non-repurchasing firms.

From a portfolio rebalancing perspective, it is more plausible that investors reinvest proceeds from selling shares of repurchasing firms into non-repurchasing firms, rather than repurchasing the same shares they just sold. This supports the interpretation that share repurchases can affect the prices of non-repurchasing firms through portfolio rebalancing. Nevertheless, as shown in Panel B, repurchasing firms also experience high returns following large repurchases. One possible explanation is that mutual funds and ETFs allocate inflows roughly in proportion to their existing portfolio weights—and since repurchasing firms are typically large, they tend to have greater representation in those portfolios.

I conjecture that reinvestment occurs both through mutual fund flows and direct trading. While mutual fund flows likely affect both groups of firms, direct trading is more likely to influence non-repurchasing firms. Finally, the fact that the economic magnitudes of return predictability consistently decline when using instruments further supports the validity and exogeneity of the GIVs.

Overall, the evidence is more consistent with a non-fundamental, flow-based mechanism than with an information-based explanation. The identification strategy—leveraging both GIVs and the construction of market portfolios based solely on non-repurchasing firms—makes a strong case that flows generated by share repurchases can elevate stock market valuations, even when those repurchases do not convey information about the aggregate economy or financial markets.

Appendix Tables A.I and A.II show that the return predictability of share repurchases is stronger during periods of high repurchase activity. These results are consistent with the idea that repurchases have a larger impact when they are more substantial in dollar magnitude. Appendix Table A.III finds no evidence of return reversals. Specifically, lagged share repurchases beyond one quarter do not negatively predict market returns.

4 Cross-sectional Evidence

The previous section presents robust evidence that share repurchases increase the value of non-repurchasing firms through the money flows they generate, even when those repurchases are uninformed. This section explores the possibility that investors follow investment styles when making reinvestment decisions, which could contribute to cross-sectional variation in price impacts.

4.1 Style-aligned Reinvestment Flows and HML Returns

Many investors follow investment styles (Barberis and Shleifer, 2003). For example, large-value mutual funds primarily invest in large-value stocks, and technology funds mainly invest in technology stocks. The popular categories used as styles in the asset management industry are size (market capitalization) and value vs. growth (e.g., book-to-market). Based on this, I hypothesize that following share repurchases, flows will primarily shift to non-repurchasing firms with characteristics similar to those of repurchasing firms (e.g., size, book-to-market). In addition, I conjecture that style-aligned reinvestment flows will be stronger when firms with certain characteristics drive share repurchases. For example, if large growth firms are the primary repurchasing firms, reinvestment flows will be larger among other large growth stocks.

To start, I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Panel (a) of Figure 2 illustrates that share repurchases have predominantly been conducted by large firms. It also shows that since the late 1990s, large growth firms have emerged as major buyback firms. Before then, their repurchases were similar to those of other large firms, such as value firms. Moreover, there is substantial time-series variation in which firms with certain characteristics engage more actively in share repurchases. For example, Panels (a) and (b) show that in the 2010s, large growth firms' share repurchases were generally higher, both in dollar terms and as a percentage of total market value. However, Panel (b) shows that since 2020, large value firms have become more prominent repurchasers than large growth firms, when measured as a share of total market value.

Next, I construct flows to the Fama-French HML and SMB factors. Specifically, following Lou (2012) and Li (2022), I calculate flow-induced trades for large growth, large blend, large value, small growth, small blend, and small value stocks. I then compute flows to the HML factor as:

$$\begin{aligned} \textit{Flow (value minus growth)} = &\frac{1}{2} \cdot (\textit{Flow to large value} - \textit{Flow to large growth}) \\ &+ \frac{1}{2} \cdot (\textit{Flow to small value} - \textit{Flow to small growth}). \end{aligned} \tag{5}$$

Similarly, I construct aggregate share repurchases and GIVs across the six groups: large growth, large blend, large value, small growth, small blend, and small value stocks. I then calculate *Repurchases* (*value minus growth*) and *GIV* (*value minus growth*) following the definition in Equation 5. Additionally, I define share repurchases for growth stocks as follows:

$$\begin{aligned} \textit{Repurchases (growth)} = &\frac{1}{2} \cdot \textit{Repurchases (big growth)} \\ &+ \frac{1}{2} \cdot \textit{Repurchases (small growth)}, \end{aligned} \tag{6}$$

and for value stocks as:

$$\begin{aligned} \textit{Repurchases (value)} = &\frac{1}{2} \cdot \textit{Repurchases (big value)} \\ &+ \frac{1}{2} \cdot \textit{Repurchases (small value)}. \end{aligned} \tag{7}$$

Similarly, I compute GIVs for growth and value stocks as:

$$GIV\ (growth) = \frac{1}{2} \cdot GIV\ (big\ growth) + \frac{1}{2} \cdot GIV\ (small\ growth), \tag{8}$$

$$GIV\ (value) = \frac{1}{2} \cdot GIV\ (big\ value) + \frac{1}{2} \cdot GIV\ (small\ value). \tag{9}$$

Using these constructed variables, Table 6 examines flows to growth and value firms. Panel A presents results for the full sample. Panel B focuses on periods when growth firms engaged more actively in buybacks than value firms, defined as times when repurchases by growth firms, scaled by lagged total market value, exceeded those of value firms. Panel C covers periods when value firms repurchased more than growth firms.

Panel A shows that, over the full sample from 1986 to 2023, there is no meaningful variation in flows between growth and value firms. However, Panel B reveals that when growth firms engage in share repurchases more than value firms, higher repurchases among growth firms lead to lower flows to the HML factor, as indicated by the positive coefficient in the first column of Panel B. This relationship is primarily driven by share repurchases among growth firms. Specifically, the second column of Panel B shows that large repurchases by growth firms are followed by outflows from the HML factor. This occurs because growth firms are in the short leg of the HML factor. Similar patterns emerge with GIVs (see the last two columns of Panel B). However, I note that the results become somewhat weaker with GIVs, especially when investigating growth and value firms separately. Still, the direction of the effects is consistent with the flow channel. Finally, Panel C shows that when value firms engage in share repurchases more than growth firms, there is no meaningful variation in flows between growth and value firms.

Appendix Table A.IV shows that, similar to Table 3, a contemporaneous relationship between flows and share repurchases exists for growth and value firms. Specifically, it appears that growth firms repurchase less when contemporaneous outflows occur for growth firms. However, analyses with GIVs show no meaningful contemporaneous relationship between share repurchases and flows into the HML factor, which is similar to the earlier finding regarding the aggregate stock market. Again, the results suggest that GIVs remove the component of share repurchases driven by systematic outflows from firms with certain characteristics.

In Table 7, I construct the HML factor using only non-repurchasing firms for identification. I find that return patterns in HML closely align with the earlier flow patterns. Specifically, Panel A shows no meaningful relationship between share repurchases and HML returns in the full sample. However, Panel B reveals that when growth firms engage in share repurchases more than value firms, higher repurchases among growth firms negatively predict next-quarter HML returns (see the first two columns of Panel B). The last two columns of Panel B show that GIVs also strongly predict next-period HML returns, with results driven by share repurchases from a few large growth firms. Panel C shows that return predictability is muted during periods when value firms engage more in share repurchases. Once again, these return patterns closely align with the flow patterns in Table6, supporting the flow-based mechanism.

Appendix Table A.V reveals that return predictability is similarly strong when using the original HML factor. Appendix Table A.VI reports muted results when HML is constructed using repurchasing firms, showing that the return predictability is driven by non-repurchasing firms.[10]

Taken together, the evidence suggests that share repurchases by growth firms in recent decades have contributed—at least in part—to the decline of the value premium (Fama and French, 2021). On average, outflows from the HML factor occur during periods when growth firms drive aggregate share repurchases. The HML factor also tends to perform poorly during these times, with especially weak performance when repurchases by growth firms exceed those by value firms. Because my analyses rely on instruments and the HML factor is constructed using non-repurchasing firms, the results provide strong evidence that repurchases and style-

[10] Appendix Tables A.VII, A.VIII, and A.IX show no meaningful contemporaneous relationship between repurchases and HML returns, regardless of how the HML factor is constructed.

aligned reinvestment flows are key channels behind this decline. Notably, the value premium reemerged in the 2020s—a period during which value firms repurchased more than growth firms (see Panel (b) of Figure 2).

4.2 Style-aligned Reinvestment Flows and SMB Returns

Next, I examine whether share repurchases also influence the realized returns of the SMB factor, as size is another key category in style investing. I compute flows to the SMB factor as follows:

$$Flow\ (small\ minus\ big) = Flow\ to\ small - Flow\ to\ large. \tag{10}$$

Similarly, I calculate *Repurchases* (*small minus big*) and *GIV* (*small minus big*) following the definition in Equation 10. Additionally, I define share repurchases for big stocks as follows:

$$\begin{aligned} Repurchases\ (big) = & \frac{1}{3} \cdot Repurchases\ (big\ growth) \\ & + \frac{1}{3} \cdot Repurchases\ (big\ blend) \\ & + \frac{1}{3} \cdot Repurchases\ (big\ value), \end{aligned} \tag{11}$$

and for small stocks as:

$$\begin{aligned} Repurchases\ (small) = & \frac{1}{3} \cdot Repurchases\ (small\ growth) \\ & + \frac{1}{3} \cdot Repurchases\ (small\ blend) \\ & + \frac{1}{3} \cdot Repurchases\ (small\ value). \end{aligned} \tag{12}$$

Similarly, I compute GIVs for big and small stocks as:

$$\begin{aligned} GIV\ (big) = & \frac{1}{3} \cdot GIV\ (big\ growth) + \frac{1}{3} \cdot GIV\ (big\ blend) \\ & + \frac{1}{3} \cdot GIV\ (big\ value), \end{aligned} \tag{13}$$

$$GIV\ (small) = \frac{1}{3} \cdot GIV\ (small\ growth) + \frac{1}{3} \cdot GIV\ (small\ blend) + \frac{1}{3} \cdot GIV\ (small\ value). \tag{14}$$

Using these constructed variables, I examine flows to the SMB factor in Table 8. As with the earlier results for the HML factor, Panel A shows no meaningful relationship between share repurchases and flows to the SMB factor in the full sample. This pattern also holds during periods when big firms repurchase more than small firms. Perhaps surprisingly, however, Panel C reveals that when small firms repurchase more aggressively than big firms, higher repurchases by big firms are associated with lower flows to the SMB factor.

At first glance, this result may seem puzzling, as one might expect repurchases by big firms to have a stronger impact on the SMB factor during periods when they represent a larger share of total buybacks (i.e., stronger results in Panel B). However, Figure 2 shows that big firms have consistently driven aggregate repurchases throughout the sample period. Even in periods when small firms were relatively more active—defined as times when small firms' repurchases (scaled by lagged total market value) exceeded those of big firms, as in Panel C—big firms continued to play a central role in total buybacks, both in dollar terms and relative to market size. These periods mostly fall in the post-2000 era, when the gap between small and big firm repurchases narrowed. Thus, the negative relationship between big firm repurchases and flows to the SMB factor in these years may be less surprising, given that big firms remained the primary contributors to total buybacks.

Appendix Table A.X shows that, consistent with the results for growth and value firms in Appendix Table A.IV, there is a contemporaneous negative relationship between flows and share repurchases among small and big firms. For example, small firms repurchase less when they experience contemporaneous outflows from the mutual fund sector. As before, this relationship disappears entirely when using GIVs, suggesting that they effectively purge the influence of common factors, such as systematic buyback behavior tied to aggregate outflows within size categories.

In Table 9, I construct the SMB factor using only non-repurchasing firms for identification and examine whether flows from share repurchases predict realized SMB returns across different sample periods. Panel A shows that, without instruments, there is a weak relationship between share repurchases and SMB returns in the full sample. Specifically, higher repurchases by small firms positively predict next-quarter SMB returns, while the relationship is weaker for buybacks by big firms. However, this return predictability disappears when using GIVs.

Consistent with the earlier findings on flows to the SMB factor across subsamples, Panels B and C show that higher repurchases by big firms predict lower next-quarter SMB returns, with larger economic magnitudes when small firms repurchase more actively than big firms (i.e., stronger results in Panel C). However, the return predictability is generally not statistically significant, especially when using GIVs. I therefore conclude that while share repurchases influence the SMB factor to some extent, the effects are much weaker than those observed for the HML factor.

Appendix Table A.XI shows similar return predictability when using the original SMB factor. In Appendix Table A.XII, I construct the SMB factor using only repurchasing firms and find stronger return predictability without instruments. However, this relationship once again becomes muted when using GIVs.

Appendix Tables A.XIII, A.XIV, and A.XV show a strong contemporaneous relationship between SMB returns and repurchases by small firms. These results are consistent with the flow patterns documented in Appendix Table A.X. Together, they suggest that small firms tend to repurchase more when aggregate outflows occur for small firms—possibly contributing to contemporaneous price declines. However, this negative relationship disappears entirely when using GIVs. Taken together, the empirical results throughout the paper suggest that GIVs effectively purge systematic relationships between share repurchases, aggregate flows, and return patterns.

5 Conclusion

This paper presents evidence that flows generated by share repurchases increase the value of non-repurchasing firms. I find that cash distributed through share repurchases ultimately flows back into the stock market, specifically into shares of non-repurchasing firms. Importantly, these flows remain in the stock market for plausibly exogenous reasons—for example, many investors follow rigid asset allocation rules (e.g., 80% in stocks and 20% in bonds) and hold a large fraction of their investments in equity, possibly to continue earning the equity premium (Booth, 2023). These flows are particularly uninformed when aggregate share repurchases are driven by a few large firms' idiosyncratic buybacks. Based on this idea, I construct granular instrumental variables for share repurchases and present evidence supporting a causal interpretation: uninformed flows from share repurchases generate material price impacts on non-repurchasing firms.

Following their investment styles, investors reinvest the proceeds from selling shares of repurchasing firms into non-repurchasing firms with similar characteristics, such as size and book-to-market ratio, thereby increasing their valuations. These style-aligned reinvestment flows influence the realized returns of risk factors. For example, large share repurchases by growth firms in the 2000s increased the valuations of other growth firms, contributing to the decline of the value premium.

Overall, I establish that uninformed flows are generated through share repurchases. Identification strategies using granular instrumental variables and focusing only on non-repurchasing firms provide strong evidence that the non-fundamental, flow-based mechanism is the primary channel through which flows from share repurchases impact prices.

Since share repurchases generate price impact without reversals, it is possible that capital is efficiently reallocated through portfolio rebalancing around buybacks. Repurchasing firms typically distribute cash to investors because they are mature and lack investment opportunities. If this cash then flows to younger firms with greater growth potential—raising their valuations—these firms may experience a reduction in their cost of capital, enabling increased investment in R&D and capital expenditures through the relaxation of financial constraints. Investigating this possibility would be an interesting avenue for future research.

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Figure 1. The Evolution of Share Repurchases

The figure presents the evolution of share repurchases. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms.

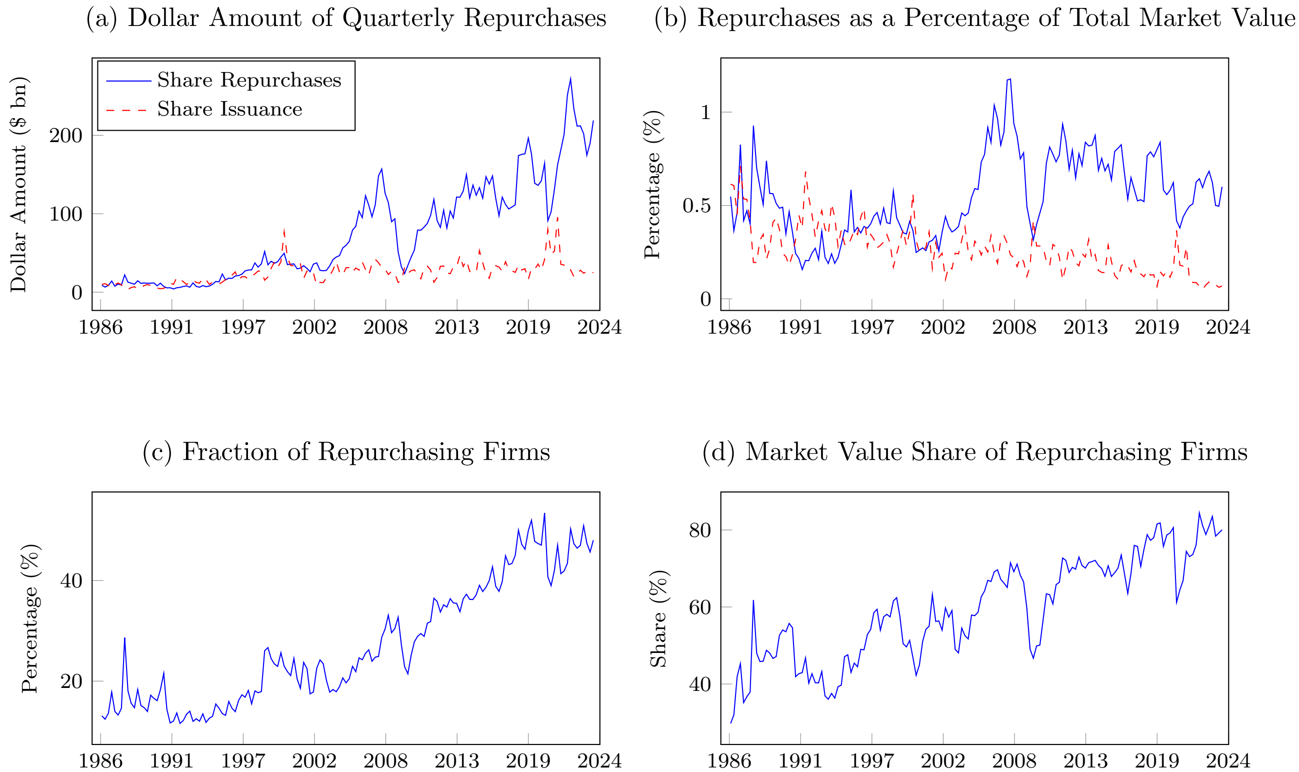

Figure 2. The Evolution of Share Repurchases by Firm Characteristics

The figure presents the evolution of share repurchases across firm groups based on their characteristics. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value.

(a) Dollar Amount of Quarterly Repurchases (b) Repurchases as a Percentage of Total Market Value

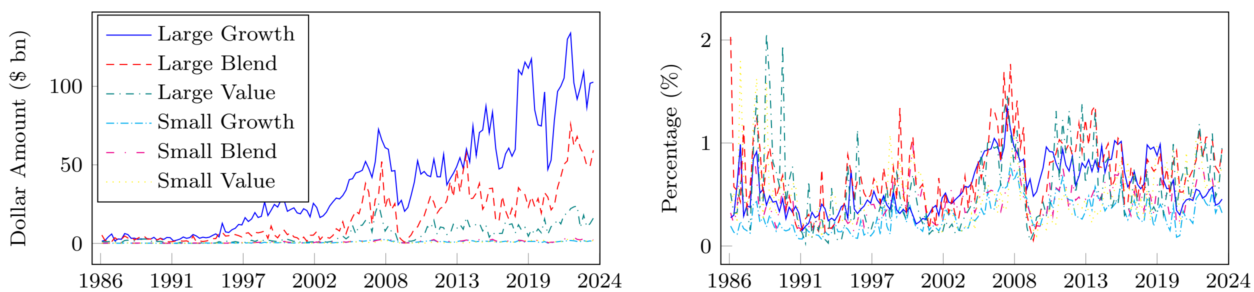

Table 1. Summary Statistics

The table the summary statistics of the quarterly firm-level panel data. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. Net repurchases are defined as the purchase of common and preferred stock ($PRSTKC$) minus the sale of common and preferred stock ($SSTK$). Age is a firm's age in years. Market leverage is defined as total debt ($DLC + DLTT$) divided by total assets (AT) minus book equity (CEQ) plus market equity ($CSHO \times PRCC\_F$). Operating cash flow is operating income ($OIBDP$) minus interest ($XINT$) minus income taxes (TXT) minus the change in net working capital. Cash is cash and marketable securities (CHE). Tobin's q is the market value of assets scaled by the book value of assets. The market value of assets is the sum of the market value of equity ($CSHO \times PRCC\_F$), total debt ($DLC + DLTT$), and the book value of preferred stock, minus investment tax credits ($TXDITC$).

Panel A: Full Sample

	N	Mean	SD	P5	P25	P50	P75	P95
Net repurchases/Lagged market value	536115	0.002	0.006	0.000	0.000	0.000	0.000	0.015
Log(Total assets)	536115	5.248	2.262	1.732	3.615	5.117	6.788	9.162
Log(Age)	536115	2.315	0.996	0.693	1.609	2.398	3.091	3.807
Market leverage	536115	0.165	0.171	0.000	0.013	0.113	0.263	0.529
Operating cash flow/Lagged total assets	536115	-0.005	0.076	-0.166	-0.030	0.010	0.037	0.098
Cash/Total assets	536115	0.204	0.241	0.003	0.026	0.099	0.296	0.767
Tobin's q	536115	2.114	1.726	0.778	1.098	1.509	2.402	5.840
R&D expenditure/Lagged total assets	536115	0.015	0.029	0.000	0.000	0.000	0.017	0.081
Capital expenditure/Lagged total assets	536115	0.014	0.019	0.000	0.003	0.008	0.018	0.053

Panel B: Repurchasing Firms

	N	Mean	SD	P5	P25	P50	P75	P95
Net repurchases/Lagged market value	126427	0.009	0.010	0.000	0.001	0.005	0.013	0.030
Log(Total assets)	126427	6.412	2.304	2.572	4.752	6.500	8.014	10.158
Log(Age)	126427	2.663	0.987	0.693	2.079	2.833	3.401	3.970
Market leverage	126427	0.163	0.160	0.000	0.027	0.122	0.248	0.501
Operating cash flow/Lagged total assets	126427	0.014	0.058	-0.089	-0.006	0.020	0.043	0.097
Cash/Total assets	126427	0.167	0.194	0.005	0.029	0.090	0.231	0.605
Tobin's q	126427	1.963	1.426	0.797	1.110	1.510	2.260	4.768
R&D expenditure/Lagged total assets	126427	0.009	0.019	0.000	0.000	0.000	0.009	0.044
Capital expenditure/Lagged total assets	126427	0.014	0.016	0.000	0.004	0.009	0.017	0.044

Panel C: Non-repurchasing Firms

	N	Mean	SD	P5	P25	P50	P75	P95
Net repurchases/Lagged market value	409688	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Log(Total assets)	409688	4.889	2.124	1.579	3.378	4.768	6.290	8.585
Log(Age)	409688	2.207	0.974	0.693	1.386	2.303	2.996	3.714
Market leverage	409688	0.165	0.174	0.000	0.010	0.109	0.268	0.535
Operating cash flow/Lagged total assets	409688	-0.010	0.080	-0.184	-0.039	0.005	0.034	0.098
Cash/Total assets	409688	0.215	0.252	0.003	0.026	0.103	0.322	0.797
Tobin's q	409688	2.160	1.806	0.772	1.094	1.509	2.458	6.152
R&D expenditure/Lagged total assets	409688	0.017	0.032	0.000	0.000	0.000	0.020	0.091
Capital expenditure/Lagged total assets	409688	0.015	0.019	0.000	0.003	0.008	0.018	0.056

Table 2. Top 10 Repurchasing Firms in 2015

The table shows the top 10 repurchasing firms in 2015. Net repurchases are defined as the purchase of common and preferred stock ($PRSTKC$) minus the sale of common and preferred stock ($SSTK$).

Firm	Amount ($ bn)	Share (%)	Cumulative (%)
Apple	36.21	7.34	7.34
Microsoft	13.81	2.80	10.15
Qualcomm	10.46	2.12	12.27
Gilead Sciences	9.68	1.96	14.23
Oracle	9.10	1.85	16.08
Raytheon	8.86	1.80	17.88
AbbVie	7.43	1.51	19.38
Home Depot	6.77	1.37	20.76
Comcast	6.71	1.36	22.12
Boeing	6.45	1.31	23.43

Table 3. Share Repurchases and Contemporaneous Flows

The table reports the relationship between share repurchases and contemporaneous fund flows. I define mutual funds and ETFs as equity funds if their CRSP objective codes start with "E" or "M". The latter captures balanced funds, which I classify as equity funds because they typically have a high allocation to stocks. Bond funds are those with CRSP objective codes starting with "I". Passive funds are those with non-missing index_fund_flag variables, while the remaining funds are classified as active funds. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: Contemporaneous Flows (Full Sample Period)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t)	1.48	-3.90***	-4.36***	-2.80*	-4.68***	-11.34***
	(1.21)	(-4.34)	(-4.39)	(-1.70)	(-4.42)	(-5.66)
Observations	152	152	152	134	152	152
R-squared	0.010	0.112	0.114	0.021	0.115	0.176
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t)	-0.37	0.10	-0.18	-1.84	-0.39	-4.37**
	(-0.31)	(0.11)	(-0.17)	(-1.30)	(-0.36)	(-2.05)
Observations	152	152	152	134	152	152
R-squared	0.029	0.034	0.042	0.056	0.039	0.051
Panel B: Contemporaneous Flows (Periods of High Repurchases)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t)	2.03	-3.46***	-3.48***	-2.06	-3.43***	-7.13***
	(1.52)	(-3.84)	(-3.39)	(-1.12)	(-2.80)	(-3.92)
Observations	76	76	76	67	76	76
R-squared	0.030	0.166	0.135	0.019	0.096	0.172
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t)	0.32	0.53	0.31	0.78	0.24	-1.13
	(0.14)	(0.29)	(0.15)	(0.29)	(0.11)	(-0.30)
Observations	76	76	76	67	76	76
R-squared	0.117	0.055	0.065	0.019	0.063	0.089
Panel C: Contemporaneous Flows (Periods of Low Repurchases)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t)	-1.61	-6.61***	-7.68***	-5.60	-8.56***	-19.16***
	(-0.53)	(-2.85)	(-3.04)	(-1.45)	(-3.43)	(-3.63)
Observations	76	76	76	67	76	76
R-squared	0.004	0.099	0.111	0.032	0.137	0.151
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t)	-0.52	0.60	1.02	-9.47**	1.10	-5.48
	(-0.16)	(0.24)	(0.38)	(-2.59)	(0.39)	(-0.90)
Observations	76	76	76	67	76	76
R-squared	0.063	0.075	0.053	0.244	0.060	0.041

Table 4. Share Repurchases and Future Flows

The table reports the relationship between share repurchases and future fund flows. I define mutual funds and ETFs as equity funds if their CRSP objective codes start with "E" or "M". The latter captures balanced funds, which I classify as equity funds because they typically have a high allocation to stocks. Bond funds are those with CRSP objective codes starting with "I". Passive funds are those with non-missing index_fund_flag variables, while the remaining funds are classified as active funds. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: Future Flows (Full Sample Period)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t-1)	1.38	3.22***	2.91***	2.20	2.37**	4.09*
	(1.13)	(3.54)	(2.85)	(1.33)	(2.14)	(1.88)
Observations	152	152	152	134	152	152
R-squared	0.009	0.077	0.051	0.013	0.030	0.023
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t-1)	0.47	1.81*	1.33	1.98	0.70	3.68*
	(0.38)	(1.94)	(1.29)	(1.41)	(0.64)	(1.69)
Observations	152	152	152	134	152	152
R-squared	0.022	0.061	0.081	0.038	0.084	0.047
Panel B: Future Flows (Periods of High Repurchases)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t-1)	0.07	2.44**	2.08*	3.32*	1.67	1.60
	(0.05)	(2.39)	(1.80)	(1.78)	(1.22)	(0.75)
Observations	76	76	76	67	76	76
R-squared	0.000	0.072	0.042	0.046	0.020	0.008
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t-1)	0.51	3.52***	3.91***	2.20	4.14***	4.29
	(0.30)	(2.82)	(2.73)	(1.08)	(2.70)	(1.55)
Observations	76	76	76	67	76	76
R-squared	0.092	0.162	0.176	0.080	0.221	0.083
Panel C: Future Flows (Periods of Low Repurchases)						
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
Repurchases (t-1)	2.87	6.60***	6.94***	1.92	6.43***	17.71***
	(1.22)	(3.77)	(3.58)	(0.56)	(3.27)	(4.46)
Observations	76	76	76	67	76	76
R-squared	0.020	0.161	0.148	0.005	0.127	0.212
	Deposits (t)	All flows (t)	Equity flows (t)	Bond flows (t)	Active flows (t)	Passive flows (t)
GIV (t-1)	0.66	1.40	0.37	3.23	-0.54	6.44*
	(0.33)	(0.95)	(0.24)	(1.50)	(-0.33)	(1.86)
Observations	76	76	76	67	76	76
R-squared	0.032	0.100	0.124	0.106	0.130	0.139

Table 5. Share Repurchases and Stock Market Returns

The table reports the relationship between share repurchases and market returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: All Firms

	Market return (t)							
Repurchases (t)	-22.75***	-21.89***						
	(-4.06)	(-3.76)						
GIV (t)			2.76	3.49				
			(0.49)	(0.59)				
Repurchases (t-1)					13.82**	17.20***		
					(2.40)	(2.90)		
GIV (t-1)							13.54**	15.79**
							(2.41)	(2.59)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.099	0.145	0.002	0.085	0.037	0.113	0.037	0.124

Panel B: Repurchasing Firms

	Market return (t)							
Repurchases (t)	-23.40***	-22.03***						
	(-4.23)	(-3.81)						
GIV (t)			0.27	-0.29				
			(0.05)	(-0.05)				
Repurchases (t-1)					12.71**	16.07***		
					(2.22)	(2.71)		
GIV (t-1)							10.24*	11.30*
							(1.82)	(1.84)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.106	0.141	0.000	0.082	0.032	0.101	0.022	0.104

Panel C: Non-repurchasing Firms

	Market return (t)							
Repurchases (t)	-24.86***	-23.31***						
	(-3.90)	(-3.50)						
GIV (t)			3.42	4.83				
			(0.54)	(0.72)				
Repurchases (t-1)					16.65**	20.93***		
					(2.55)	(3.11)		
GIV (t-1)							13.09**	15.48**
							(2.04)	(2.21)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.092	0.131	0.002	0.080	0.042	0.116	0.027	0.108

Table 6. Share Repurchases and Future Flows to Growth and Value Firms

The table reports the relationship between share repurchases and flows to the HML factor. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: Future Flows (Full Sample)

	Flow (value minus growth, t)			
Repurchases (value minus growth, t-1)	-0.51			
	(-1.08)			
Repurchases (growth, t-1)		-1.36		
		(-1.29)		
Repurchases (value, t-1)		-0.51		
		(-1.08)		
GIV (value minus growth, t-1)			0.22	
			(0.51)	
GIV (growth, t-1)				0.13
				(0.17)
GIV (value, t-1)				0.45
				(0.74)
Observations	152	152	152	152
R-squared	0.008	0.033	0.002	0.004

Panel B: Future Flows (Higher Repurchase Periods for Growth Firms)

	Flow (value minus growth, t)			
Repurchases (value minus growth, t-1)	1.26*			
	(1.68)			
Repurchases (growth, t-1)		-4.00***		
		(-2.97)		
Repurchases (value, t-1)		1.14		
		(1.56)		
GIV (value minus growth, t-1)			0.72*	
			(1.76)	
GIV (growth, t-1)				-0.97
				(-1.08)
GIV (value, t-1)				0.61
				(1.16)
Observations	76	76	76	76
R-squared	0.037	0.108	0.040	0.042

Panel C: Future Flows (Higher Repurchase Periods for Value Firms)				
	Flow (value minus growth, t)			
Repurchases (value minus growth, t-1)	-0.84			
	(-1.26)			
Repurchases (growth, t-1)		-0.39		
		(-0.24)		
Repurchases (value, t-1)		-0.79		
		(-1.18)		
GIV (value minus growth, t-1)			-1.22	
			(-1.43)	
GIV (growth, t-1)				1.10
				(0.90)
GIV (value, t-1)				-1.39
				(-0.95)
Observations	76	76	76	76
R-squared	0.021	0.030	0.027	0.027

Table 7. HML Returns Constructed from Non-Repurchasing Firms

The table reports the relationship between share repurchases and HML returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML from Non-repurchasing Firms (Full Sample)

	HML (t)			
Repurchases (value minus growth, t-1)	2.17			
	(0.73)			
Repurchases (growth, t-1)		-9.35		
		(-1.41)		
Repurchases (value, t-1)		2.18		
		(0.74)		
GIV (value minus growth, t-1)			3.77	
			(1.39)	
GIV (growth, t-1)				-3.10
				(-0.63)
GIV (value, t-1)				4.19
				(1.11)
Observations	152	152	152	152
R-squared	0.004	0.013	0.013	0.013

Panel B: HML from Non-repurchasing Firms (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t-1)	5.51			
	(1.24)			
Repurchases (growth, t-1)		-24.45***		
		(-3.13)		
Repurchases (value, t-1)		4.67		
		(1.10)		
GIV (value minus growth, t-1)			7.15**	
			(2.40)	
GIV (growth, t-1)				-14.84**
				(-2.29)
GIV (value, t-1)				3.96
				(1.04)
Observations	76	76	76	76
R-squared	0.020	0.120	0.072	0.094

Panel C: HML from Non-repurchasing Firms (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t-1)	1.76			
	(0.40)			
Repurchases (growth, t-1)		0.29		
		(0.03)		
Repurchases (value, t-1)		1.69		
		(0.38)		
GIV (value minus growth, t-1)			-5.21	
			(-1.07)	
GIV (growth, t-1)				6.79
				(0.97)
GIV (value, t-1)				-3.05
				(-0.36)
Observations	76	76	76	76
R-squared	0.002	0.003	0.015	0.017

Table 8. Share Repurchases and Future Flows to Big and Small Firms

The table reports the relationship between share repurchases and flows to the SMB factor. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: Future Flows (Full Sample)

	Flow (small minus big, t)			
Repurchases (small minus big, t-1)	0.61			
	(0.82)			
Repurchases (big, t-1)		-0.66		
		(-0.88)		
Repurchases (small, t-1)		0.32		
		(0.30)		
GIV (small minus big, t-1)			1.15	
			(1.51)	
GIV (big, t-1)				-1.35
				(-1.55)
GIV (small, t-1)				0.56
				(0.39)
Observations	152	152	152	152
R-squared	0.004	0.005	0.015	0.016

Panel B: Future Flows (Higher Repurchase Periods for Big Firms)

	Flow (small minus big, t)			
Repurchases (small minus big, t-1)	-0.72			
	(-0.92)			
Repurchases (big, t-1)		0.65		
		(0.79)		
Repurchases (small, t-1)		-0.93		
		(-0.88)		
GIV (small minus big, t-1)			0.11	
			(0.12)	
GIV (big, t-1)				-0.16
				(-0.14)
GIV (small, t-1)				-0.02
				(-0.01)
Observations	76	76	76	76
R-squared	0.011	0.012	0.000	0.000

Panel C: Future Flows (Higher Repurchase Periods for Small Firms)

	Flow (small minus big, t)			
Repurchases (small minus big, t-1)	2.00			
	(1.47)			
Repurchases (big, t-1)		-1.96		
		(-1.41)		
Repurchases (small, t-1)		2.22		
		(1.13)		
GIV (small minus big, t-1)			2.47**	
			(2.08)	
GIV (big, t-1)				-3.17**
				(-2.28)
GIV (small, t-1)				0.54
				(0.23)
Observations	76	76	76	76
R-squared	0.028	0.029	0.055	0.067

Table 9. SMB Returns Constructed from Non-Repurchasing Firms

The table reports the relationship between share repurchases and SMB returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB from Non-repurchasing Firms (Full Sample)

	SMB (t)			
Repurchases (small minus big, t-1)	1.13			
	(0.36)			
Repurchases (big, t-1)		0.03		
		(0.01)		
Repurchases (small, t-1)		7.40*		
		(1.66)		
GIV (small minus big, t-1)			2.31	
			(0.71)	
GIV (big, t-1)				-1.88
				(-0.51)
GIV (small, t-1)				3.54
				(0.57)
Observations	152	152	152	152
R-squared	0.001	0.027	0.003	0.004

Panel B: SMB from Non-repurchasing Firms (Higher Repurchase Periods for Big Firms)

	SMB (t)			
Repurchases (small minus big, t-1)	-2.42			
	(-0.76)			
Repurchases (big, t-1)		4.28		
		(1.31)		
Repurchases (small, t-1)		3.11		
		(0.74)		
GIV (small minus big, t-1)			0.09	
			(0.02)	
GIV (big, t-1)				0.96
				(0.20)
GIV (small, t-1)				2.97
				(0.39)
Observations	76	76	76	76
R-squared	0.008	0.058	0.000	0.003

Panel C: SMB from Non-repurchasing Firms (Higher Repurchase Periods for Small Firms)				
		SMB (t)		
Repurchases (small minus big, t-1)	7.27			
	(1.22)			
Repurchases (big, t-1)		-6.22		
		(-1.03)		
Repurchases (small, t-1)		14.03		
		(1.63)		
GIV (small minus big, t-1)			5.26	
			(1.02)	
GIV (big, t-1)				-6.25
				(-1.02)
GIV (small, t-1)				2.54
				(0.25)
Observations	76	76	76	76
R-squared	0.020	0.035	0.014	0.015

Appendix A A Theoretical Framework

In this section, I develop a simple theoretical framework building on Gabaix and Koijen (2024b). The goal is to understand how institutional investors' constraints translate share repurchases into permanent inflows in the stock market and to study how the resulting flows increase the value of non-repurchasing firms when stock demand is price-inelastic.

I first review the model in Gabaix and Koijen (2024b). This review will be useful in understanding the core economics of how flows generate price impacts in inelastic markets. In addition, the model will spell out how to measure flows that matter for stock prices. Specifically, the model will show that only unexpected flows affect stock prices, while expected flows do not.

Then I develop a variant of the model with a repurchasing firm and a non-repurchasing firm and study how flows from share repurchases increase the value of the non-repurchasing firm. The model will show that only unexpected share repurchases will generate price impacts since these will create unanticipated flows into the non-repurchasing firm.

A.1 A Model with a Representative Stock

It is useful to consider a special case with a representative stock to understand the key intuition underlying the price impacts of flows in inelastic markets. This subsection reviews the model with the representative stock in Gabaix and Koijen (2024b).

A.1.1 General Environment

Time is discrete, and the model has an infinite horizon. The representative stock is with the supply of Q_t shares, has the price P_t, and pays the dividend D_t in each period. The price will be endogenously determined in equilibrium. In addition, there is a bond with a fixed risk-free rate r_f.

The economy in the model follows a balanced growth path. In a rational baseline economy, the expected return is constant and equals the long-run average ($\bar{\pi}$), and $\bar{Q}_t$ is the baseline quantity of shares. The baseline price ($\bar{P}_t$), dividend ($\bar{D}_t$), and wealth ($\bar{W}_t$) grow with a common cumulative growth factor G_t where $\frac{G_{t+1}}{G_t}$ is i.i.d. with mean $1+g$. I define $p_t = \frac{P_t}{\bar{P}_t} - 1$, $w_t = \frac{W_t}{\bar{W}_t} - 1$, and $q_t = \frac{Q_t}{\bar{Q}_t} - 1$ as the deviations from the baseline. I call $d_t = \mathbb{E}_t\left[\frac{D_{t+1}}{\bar{D}_{t+1}} - 1\right]$ dividend news announced at time t. With $\pi_t = \frac{\mathbb{E}_t[\Delta P_{t+1} + D_{t+1}]}{P_t} - (1 + r_f)$, the deviation of the expected return from the baseline ($\hat{\pi}_t = \pi_t - \bar{\pi}$) is

$$\hat{\pi}_t = \delta \cdot (d_t - p_t) + \mathbb{E}_t[\Delta p_{t+1}], \tag{A.1}$$

where $\delta = \frac{\bar{D}_t}{\bar{P}_t}$ is the dividend-price ratio in the baseline economy.[11]

There is a pure bond fund investing in bonds only and a representative fund ("the fund") investing in stocks and bonds. The fund has wealth worth W_t, holds Q_t^D shares of the stock, and has to maintain a fixed equity allocation according to an investment mandate:

$$\frac{P_t \cdot Q_t^D}{W_t} = \theta \cdot \exp(\kappa \cdot \hat{\pi}_t), \tag{A.2}$$

which states that a fraction of its wealth invested in the stock should follow Equation A.2, and the rest is invested in bonds. In a special case where $\kappa = 0$, the fund must invest a fraction θ of its wealth W_t in the stock.[12] In a more general case where $\kappa \neq 0$, the fund has some flexibility to adjust its positions in response to changes in the expected return ($\hat{\pi}_t$). Therefore, κ governs how responsive the fund's demand is to changes in market conditions.

I define flows f_t into the fund as the cumulative dollar flows in excess of the baseline amount scaled by the fund's baseline wealth:

$$f_t = \frac{F_t - \bar{F}_t}{\bar{W}_t}, \tag{A.3}$$

where F_t is the cumulative dollar flows since time 0, and $\bar{F}_t$ is the baseline cumulative dollar

[11] $\bar{\pi} = \mathbb{E}_t[\frac{\bar{P}_{t+1} + \bar{D}_{t+1}}{\bar{P}_t}] - (1 + r_f) = (1 + g) \cdot (1 + \delta) - (1 + r_f)$.

[12] In the baseline economy, $\frac{\bar{P}_t \cdot \bar{Q}_t}{\bar{W}_t} = \theta$.

flows since time 0. To focus on the price impacts of flows, I assume there are no changes in fundamentals (i.e., $d_t = 0$) in the remaining of this subsection.

Proposition 1 reports the demand for the stock.

Proposition 1. *The demand deviation from the baseline is*

$$q_t^D = -\zeta \cdot p_t + f_t + \kappa \cdot \mathbb{E}_t\big[\Delta p_{t+1}\big], \tag{A.4}$$

where $\zeta = 1 - \theta + \kappa\delta$ is the elasticity of the demand for the stock.

Proof. See Appendix B.

In textbook asset pricing theory (i.e., in elastic markets), $\kappa = \infty$,[13] and thus $\zeta = \infty$, meaning stock demand is infinitely elastic. As a result, any price deviation from the baseline (p_t) generates a very aggressive demand working in the opposite direction. In contrast, in inelastic markets, κ and ζ are small. Therefore, stock demand is not much responsive to price deviations.

The market clearing is given by $q_t^D = 0$, assuming no supply shocks (i.e., the quantity of shares is constant). Proposition 2 reports the stock price in equilibrium.

Proposition 2. *The price deviation from the baseline is*

$$p_t = \frac{1}{\kappa} \cdot \mathbb{E}_t\left[\sum_{q=t}^{\infty} \frac{1}{(1+\rho)^{q-t+1}} \cdot f_q\right] \tag{A.5}$$

where $\rho = \frac{\zeta}{\kappa}$ is the "effective" discount rate.

Proof. See Appendix B.

Equation A.5 shows that the price deviates from the baseline (i.e., a price impact) in response to today's unexpected flow (f_t) and news about future flow shocks (f_q for $q > t$) announced at time t. In textbook asset pricing theory (i.e., in elastic markets), $\kappa = \infty$, and

[13] κ is infinitely large with risk-neutral arbitrageurs. Gabaix and Koijen (2024b) show that κ is still very large in general cases.

thus $\rho = \delta$ because $\rho = \delta + \frac{1-\theta}{\kappa}$. Therefore, Equation A.5 becomes $p_t = 0$. In other words, flows do not affect the stock price in elastic markets. In contrast, in inelastic markets, κ is small. Therefore, flows generate a price impact. Moreover, the "effective discount rate" ρ is greater with a smaller κ, meaning the current price is less responsive to news about future flow shocks (f_q for $q > t$) because these are more heavily discounted.

Next, I study how price impacts arise in two cases where there are (i) unexpected inflows today and (ii) news about future inflow shocks.

A.1.2 Price Impacts of Today's Unexpected Inflows

Suppose there is a permanent inflow f_t without mean reversions. That is, this inflow is a one-time permanent shock. Then the price deviation from the baseline at time $q \geq t$ is

$$\mathbb{E}_t[p_q] = \frac{1}{\zeta} \cdot f_t, \tag{A.6}$$

and the change in the expected return at time $q \geq t$ is

$$\mathbb{E}_t[\hat{\pi}_q] = -\delta \cdot \frac{1}{\zeta} \cdot f_t. \tag{A.7}$$

Equation A.6 shows that upon the inflow shock f_t, the price deviates from the baseline by $\frac{1}{\zeta} f_t$ at time t, and it remains elevated for time $q > t$. Therefore, the inflow permanently deviates the price from the baseline. Equation A.7 shows the mirror image of the price impact, i.e., the expected return is lower due to the permanently elevated price.

In inelastic markets, the elasticity of the demand for the stock ζ is small, for example, $\zeta = 0.2$ in Gabaix and Koijen (2024b). As a result, even when a higher stock demand from an uninformed inflow starts to raise the stock price, lowering the expected return, the opposing arbitrage force is very weak. Therefore, the stock demand becomes permanently higher, generating a permanent price impact.

A.1.3 Price Impacts of News about Future Inflow Shocks

Suppose at time t, news about a future inflow shock f_T for $T > t$ is announced. Then the price deviation from the baseline for $q \in [t, T]$ is

$$\mathbb{E}_t[p_q] = \frac{1}{(1+\rho)^{T-t}} \cdot \frac{f_T}{\zeta}, \tag{A.8}$$

the change in the expected return for $q \in [t, T)$ is

$$\mathbb{E}_t[\hat{\pi}_q] = \frac{1-\theta}{\kappa} \cdot p_t, \tag{A.9}$$

and the change in the expected return for $q \geq T$ is

$$\mathbb{E}_t[\hat{\pi}_q] = -\delta \cdot \frac{1}{\zeta} \cdot f_T. \tag{A.10}$$

Equation A.8 shows that upon the inflow news at time t, the price starts to elevate and peaks at time T. When stock demand is not sensitive to changes in expected return (κ is small; see Equation A.2), the current price only weakly reacts to the inflow news because it is heavily discounted with a high $\rho = \delta + \frac{1-\theta}{\kappa}$. The reason is that even when the future inflow predictably increases the expected return (Equation A.9) since it will generate a price impact at time T, a small κ makes the stock demand insensitive to this profitable opportunity. Therefore, there is only weak "front-running" in inelastic markets. As a result, the price impact peaks at time T, and the expected return finally becomes permanently lower at time T (Equation A.10).

A.2 A Model with Repurchasing and Non-repurchasing Firms

The simple model in the previous subsection delineates the core economics of how flows generate price impacts in inelastic markets and how to measure flows that matter for prices. In this subsection, I develop a variant of the model to apply the notion of inelasticity in the context of share repurchases.

A.2.1 General Environment

Time is discrete, and the model has an infinite horizon with two firms: the representative repurchasing firm and the representative non-repurchasing firm. Each firm i is with the supply of Q_t^i shares, has the price P_t^i, and pays the dividend D_t^i in each period, where $i = R$ for the repurchasing firm and $i = N$ for the non-repurchasing firm. The prices will be endogenously determined in equilibrium. In addition, there is a bond with a fixed risk-free rate r_f. As before, the economy follows a balanced growth path around a rational baseline economy.[14]

There is a pure bond fund investing in bonds only and a representative fund ("the fund") investing in stocks and bonds. The fund has wealth worth W_t, holds $Q_t^{i,D}$ shares of stock i, and has to maintain a fixed asset allocation according to investment mandates:

$$\frac{P_t^R \cdot Q_t^{R,D}}{W_t} = \theta^R \cdot \exp\Big(\kappa^R \cdot \hat{\pi}_t^R + \kappa^{RN} \cdot \hat{\pi}_t^N + \tau(p_t^R - p_t^N)\Big), \tag{A.11}$$

$$\frac{P_t^N \cdot Q_t^{N,D}}{W_t} = \theta^N \cdot \exp\Big(\kappa^{NR} \cdot \hat{\pi}_t^R + \kappa^N \cdot \hat{\pi}_t^N + \tau(p_t^N - p_t^R)\Big), \tag{A.12}$$

which state that a fraction of its wealth invested in the repurchasing firm (non-repurchasing firm) should follow Equation A.11 (Equation A.12), and the rest is invested in bonds. In a special case where $\kappa^R = 0$, $\kappa^{RN} = 0$, $\kappa^{NR} = 0$, $\kappa^N = 0$, and $\tau = 0$, the fund must invest a fraction θ^R (θ^N) of its wealth W_t in the repurchasing firm (non-repurchasing firm) following Equation A.11 (Equation A.12).[15]

In a more general case where $\kappa^j \neq 0$, the fund has some flexibility to adjust its positions in response to changes in the expected returns of the repurchasing firm ($\hat{\pi}_t^R$) and the non-repurchasing firm ($\hat{\pi}_t^N$). For example, κ^R (κ^{RN}) governs how responsive the fund's demand

[14] See Appendix B for details on settings.

[15] In the baseline economy, $\frac{\bar{P}_t^i \cdot \bar{Q}_t^i}{\bar{W}_t} = \theta^i$.

for the repurchasing firm is to changes in the expected return of the repurchasing firm (non-repurchasing firm). With $\kappa^R > 0$ and $\kappa^{RN} < 0$, the fund increases its demand for the repurchasing firm as the repurchasing firm (non-repurchasing firm) has a higher (lower) expected return. Therefore, κ^R a determinant of the own elasticity, and κ^{RN} a determinant the cross-elasticity. Finally, with $\tau > 0$, the fund is concerned about its tracking error. For example, with $\kappa^j = 0$ and $\tau = 1$, the fund will be a buy-and-hold investor.

To focus on the price impacts of flows, I assume there are no changes in fundamentals ($d_t^i = 0$). For notational convenience, I work with the following vectors in the remaining of this subsection:

$$q_t^D = \begin{bmatrix} q_t^{R,D} \\ q_t^{N,D} \end{bmatrix}, p_t = \begin{bmatrix} p_t^R \\ p_t^N \end{bmatrix}, f_t = \begin{bmatrix} f_t^R \\ f_t^N \end{bmatrix},$$

where f_t^i is an unexpected flow into firm i.

Proposition 3 reports the demand for stocks.

Proposition 3. *The demand deviation from the baseline is*

$$q_t^D = -\zeta \cdot p_t + f_t + \kappa \cdot \mathbb{E}_t\big[\Delta p_{t+1}\big], \tag{A.13}$$

where

$$\zeta = \begin{bmatrix} 1 - \theta^R - \tau + \kappa^R \cdot \delta^R & \tau - \theta^N + \kappa^{RN} \cdot \delta^N \\ \tau - \theta^R + \kappa^{NR} \cdot \delta^R & 1 - \theta^N - \tau + \kappa^N \cdot \delta^N \end{bmatrix}, \kappa = \begin{bmatrix} \kappa^R & \kappa^{RN} \\ \kappa^{NR} & \kappa^N \end{bmatrix}.$$

Proof. See Appendix B.

Proposition 3 is simply a generalization of Proposition 1 with two stocks. The diagonal elements of ζ are the elasticities of the demand for stocks, while the non-diagonal elements of ζ represent the cross-elasticities.

The market clearing is given by $q_t^D = 0$, assuming no supply shocks (i.e., the quantity of shares is constant). Proposition 4 reports the stock prices in equilibrium.

Proposition 4. *The price deviation from the baseline is*

$$p_t = \mathbb{E}_t\left[(\zeta+\kappa)^{-1}\sum_{q=t}^{\infty}(I+\rho)^{t-q}\cdot f_q\right] \tag{A.14}$$

where I is an identity matrix and $\rho = \kappa^{-1}\zeta$.

Proof. See Appendix B.

Proposition 4 is simply a generalization of Proposition 2 with two stocks.

A.2.2 Price Impacts of Flows Generated by Share Repurchases

Next, I study how inflows generated by the repurchasing firm's share repurchases generate price impacts for the non-repurchasing firm.

I define share repurchases $q_t^{\mathcal{S}}$ as the cumulative quantity of shares net repurchased in excess of the baseline scaled by the repurchasing firm's baseline supply of shares:

$$q_t^{\mathcal{S}} = \frac{Q_t^{\mathcal{S}} - \bar{Q}_t^{\mathcal{S}}}{\bar{Q}_t^{R}}, \tag{A.15}$$

where $\bar{Q}_t^{\mathcal{S}}$ is the baseline cumulative quantity of shares net repurchased since time 0. The superscript $\mathcal{S}$ denotes that changes in supply are due to share repurchases. Equation A.15 is the definition consistent with the definition of flows in Equation A.3.

Unexpectedly large share repurchases ($Q_t^{\mathcal{S}} > \bar{Q}_t^{\mathcal{S}}$) will force the fund to sell more than the baseline quantity ($\bar{Q}_t^{\mathcal{S}}$). Since the fund has inelastic demand, the share price must increase ($P_t^R > \bar{P}_t^R$) to induce the fund to sell more. After the sales, the fund is left with unexpectedly large proceeds $C_t = P_t^R \cdot (Q_t^{\mathcal{S}} - \bar{Q}_t^{\mathcal{S}})$, meaning the fund must find other securities to invest in. I model the fund to make reinvestment with potential delay, exhibiting inertia. Specifically, the fund will use $\mu \cdot C_t$ at time t and the remaining $(1-\mu)\cdot C_t$ at time $t+1$ with $\mu \in [0,1]$. If $\mu = 1$, the fund will immediately reinvest all the proceeds. The degree of inertia will be higher with a lower μ.

Suppose at time t, the repurchasing firm buys back q_t^S. Then the flow into the non-repurchasing firm at time t is $\mu \cdot \left[\theta^R \cdot q_t^S \cdot (1 + p_t^R)\right]$ (the proof is in Appendix B). The incremental flow into the non-repurchasing firm at time $t+1$ is $(1-\mu) \cdot \left[\theta^R \cdot q_t^S \cdot (1+p_t^R)\right]$. To be consistent with the previous definition of flows, I work with cumulative flows (see Equation A.3). The cumulative flows into the non-repurchasing firm at time t are

$$f_t^N = \mu \cdot \left[\theta^R \cdot q_t^S \cdot (1+p_t^R)\right]. \tag{A.16}$$

The cumulative flows into the non-repurchasing firm at time $t+1$ are

$$f_{t+1}^N = \theta^R \cdot q_t^S \cdot (1+p_t^R). \tag{A.17}$$

In the simplest case where share repurchases q_t^S do not generate any price impact ($p_t^R = 0$), the cumulative flows at time $t+1$ will be $f_{t+1}^R = \theta^R \cdot q_t^S$. A higher θ^R means the repurchasing firm has a greater share in the stock market. Therefore, the same percentage change in shares due to q_t^S generates larger flows with a higher θ^R. In inelastic markets, unexpected share repurchases q_t^S will generate a price impact ($p_t^R > 0$). Therefore, the fund will have greater proceeds to reinvest.

Finally, flows into the repurchasing firm at time t are

$$f_t^R = q_t^S - \theta^R \cdot q_t^S \cdot (1+p_t^R). \tag{A.18}$$

Share repurchases q_t^S translate into flows into the repurchasing firm in equilibrium. However, the entire amount q_t^S does not translate into flows into the repurchasing firm since the fund is forced to sell its shares in the repurchasing firm and does not use the proceeds, $\theta^R \cdot q_t^S \cdot (1+p_t^R)$, to buy the shares of the repurchasing firm again. Instead, the fund uses the proceeds to buy the shares of the non-repurchasing firm, as in Equation A.17. Therefore, flows into the repurchasing firm are $q_t^{\mathcal{S}}$ minus the proceeds, as in Equation A.18. The proof is in Appendix B.

For notational convenience, I work with the following vectors in the remaining of this subsection:

$$f_t^{\mathcal{S}} = \begin{bmatrix} f_t^R \\ f_t^N \end{bmatrix}, p_t = \begin{bmatrix} p_t^R \\ p_t^N \end{bmatrix}.$$

I decompose $f_t^{\mathcal{S}}$ into two terms, which will be useful for solving equilibrium prices. Specifically, I decompose flows at time t as

$$f_t^{\mathcal{S}} = \underbrace{\begin{bmatrix} (1-\theta^R)\cdot q_t^{\mathcal{S}} \\ \mu\cdot\theta^R\cdot q_t^{\mathcal{S}} \end{bmatrix}}_{:=\dot{f}_t^{\mathcal{S}}} + \underbrace{\begin{bmatrix} -\theta^R\cdot q_t^{\mathcal{S}} & 0 \\ \mu\cdot\theta^R\cdot q_t^{\mathcal{S}} & 0 \end{bmatrix}}_{:=\psi_1} \cdot \underbrace{\begin{bmatrix} p_t^R \\ p_t^N \end{bmatrix}}_{=p_t}, \tag{A.19}$$

where $\dot{f}_t^{\mathcal{S}}$ and p_t are vectors, and ψ_1 is a matrix. The first component $\dot{f}_t^{\mathcal{S}}$ is flows when share repurchases do not create any price impact (see Equations A.17 and A.18). The second component $\psi_1 \cdot p_t$ is flows generated by the fund's sales of shares at an elevated price. Notice that while flows will affect prices as before, now prices also affect flows with share repurchases. This two-sided relationship will effectively change the demand elasticity at time t in equilibrium.

Similarly, I decompose flows at time $t+1$ as

$$f_{t+1}^{\mathcal{S}} = \underbrace{\begin{bmatrix} (1-\theta^R)\cdot q_t^{\mathcal{S}} \\ \theta^R\cdot q_t^{\mathcal{S}} \end{bmatrix}}_{:=\dot{f}_{t+1}^{\mathcal{S}}} + \underbrace{\begin{bmatrix} -\theta^R\cdot q_t^{\mathcal{S}} & 0 \\ \theta^R\cdot q_t^{\mathcal{S}} & 0 \end{bmatrix}}_{:=\psi_2} \cdot \underbrace{\begin{bmatrix} p_t^R \\ p_t^N \end{bmatrix}}_{=p_t}. \tag{A.20}$$

Finally, I study the price impacts of flows from share repurchases by plugging Equations A.19 and A.20 into Equation A.14. The price deviation from the baseline at time t is

$$p_t = \zeta_a^{-1} \cdot \dot{f}_t^{\mathcal{S}} + \zeta_a^{-1} \cdot \rho_a^{-1} \cdot \dot{f}_{t+1}^{\mathcal{S}}, \tag{A.21}$$

where $\zeta_a = \zeta + \kappa \cdot \left(I - \zeta^{-1} \cdot \psi_2\right) - \psi_1$ is the "effective" elasticity of demand, and $\rho_a = \zeta \cdot \kappa^{-1}$ is the "effective" discount rate. The price deviates from the baseline by $\zeta_a^{-1} \cdot \dot{f}_t^{\mathcal{S}}$ due to today's inflows. The price further deviates by $\zeta_a^{-1} \cdot \rho_a^{-1} \cdot \dot{f}_{t+1}^{\mathcal{S}}$ due to inflow news in the next period, discounted by ρ_a.

The price deviation from the baseline at time $t+1$ is

$$p_{t+1} = \zeta^{-1} \cdot \underbrace{\left(\dot{f}_{t+1}^{\mathcal{S}} + \psi_2 \cdot p_t\right)}_{= f_{t+1}^{\mathcal{S}}}. \tag{A.22}$$

The price deviates from the baseline by $\zeta^{-1} \cdot f_{t+1}^{\mathcal{S}}$ due to contemporaneous inflows.

Calibration The equity shares are $\theta^R = 0.4$ and $\theta^N = 0.4$, so the total equity share is 80%. I set $\tau = 0.4$ for the fund's concern about its tracking error and $\mu = 0.2$ for its degree of inertia. I set the dividend-to-price ratio as $\delta^i = 1\%$ since I primarily work with quarterly data in empirical analyses. The fund will have inelastic demand with $\kappa^R = \kappa^N = 0.1$ and $\kappa^{RN} = \kappa^{NR} = -0.05$.

When the repurchasing firm buys back shares worth 1% of the baseline total stock market value ($q_t^{\mathcal{S}} = 0.025$), the resulting inflows are 1.43% for the repurchasing firm and 0.21% for the non-repurchasing firm at time t. The inflows in the non-repurchasing firm are small at time t due to the fund's inertia in reinvestment. The cumulative inflows are 1.43% for the repurchasing firm and 1.07% for the non-repurchasing firm at time $t+1$.[16] Then the price deviations from the baseline are

$$\begin{bmatrix} p_t^R \\ p_t^N \end{bmatrix} = \begin{bmatrix} 0.0666 \\ 0.0241 \end{bmatrix}, \begin{bmatrix} p_{t+1}^R \\ p_{t+1}^N \end{bmatrix} = \begin{bmatrix} 0.0714 \\ 0.0532 \end{bmatrix}.$$

[16] The magnitude of inflows becomes greater than the initial value (1%) since inflows at time $t+1$ incorporate price appreciations at time t.

The share price of the repurchasing firm immediately goes up at time t upon share repurchases. Since the fund reinvests 20% of the proceeds ($\mu = 0.2$) in the non-repurchasing firm, its share price also increases.[17] When the fund reinvests the remaining proceeds at time $t+1$, the share price of the non-repurchasing firm further increases. The share price of the repurchasing firm also weakly elevates at time $t+1$ since the fund has non-zero cross-elasticities. That is, the fund increases its demand for the repurchasing firm at time $t+1$ as the share price of the non-repurchasing firm goes up. The corresponding price multipliers are 4.98 for the repurchasing firm and 4.99 for the non-repurchasing firm. In other words, flows worth one percent of the market value increase the aggregate value by about five percent.

[17] One more reason for the share price increase for the non-repurchasing firm at time t is that the fund will predictably reinvest the remaining proceeds in the next period (see Equation A.21).

Appendix B Model Details and Proofs

B.1 Economic Setup for the Model with Two Firms

Following Gabaix and Koijen (2024b), the economy in the model follows a balanced growth path. In a rational baseline economy, the risk premium is constant and equals the long-run average ($\bar{\pi}^i$), and $\bar{Q}_t^i$ is the baseline quantity of shares. The baseline prices ($\bar{P}_t^i$), dividends ($\bar{D}_t^i$), and wealth ($\bar{W}_t$) grow with a common cumulative growth factor G_t where $\frac{G_{t+1}}{G_t}$ is i.i.d. with mean $1+g$. I define $p_t^i = \frac{P_t^i}{\bar{P}_t^i} - 1$, $w_t = \frac{W_t}{\bar{W}_t} - 1$, and $q_t^i = \frac{Q_t^i}{\bar{Q}_t^i} - 1$ as the deviations from the baseline. I call $d_t^i = \mathbb{E}_t\left[\frac{D_{t+1}^i}{\bar{D}_{t+1}^i} - 1\right]$ dividend news announced at time t. With $\pi_t^i = \frac{\mathbb{E}_t[\Delta P_{t+1}^i + D_{t+1}^i]}{P_t^i} - (1+r_f)$, the deviation of risk premium from the baseline $\hat{\pi}_t^i = \pi_t^i - \bar{\pi}^i$ is

$$\hat{\pi}_t^i = \delta^i \cdot (d_t^i - p_t^i) + \mathbb{E}_t[\Delta p_{t+1}^i], \tag{B.1}$$

where $\delta^i = \frac{\bar{D}_t^i}{\bar{P}_t^i}$ is a dividend-price ratio in the baseline economy.

B.2 Proofs

B.2.1 Proof of Proposition 1

Given F_t, the fund's wealth is $W_t = P_t \cdot \bar{Q}_t + F_t$, which in the baseline economy is $\bar{W}_t = \bar{P}_t \cdot \bar{Q}_t + \bar{F}_t$. Taking the difference, I have $W_t - \bar{W}_t = \bar{P}_t \cdot \bar{Q}_t \cdot p_t + F_t - \bar{F}_t$. Dividing it by $\bar{W}_t$ gives

$$w_t = \theta \cdot p_t + f_t. \tag{B.2}$$

From Equation A.2, the stock demand is $Q_t^D = \theta \cdot \frac{W_t}{P_t} \cdot \exp(\kappa \cdot \hat{\pi}_t)$, which in the baseline economy is $\bar{Q}_t^D = \frac{\bar{W}_t}{\bar{P}_t}$. Dividing and log-linearizing give

$$q_t^D = -(1-\theta)\cdot p_t + \kappa \cdot \hat{\pi}_t + f_t. \tag{B.3}$$

Plugging Equation A.1 with $d_t = 0$ yields Equation A.4.

B.2.2 Proof of Proposition 2

Setting $q_t^D = 0$ in Equation A.4 gives

$$p_t = \frac{\mathbb{E}_t\big[p_{t+1}\big] + \frac{f_t}{\kappa}}{1+\rho}. \tag{B.4}$$

where $\rho = \frac{\zeta}{\kappa}$. Solving Equation B.4 iteratively yields Equation A.5.

B.2.3 Proof of Proposition 3

Given F_t, the fund's wealth is $W_t = P_t^R \cdot \bar{Q}_t^R + P_t^N \cdot \bar{Q}_t^N + F_t$, which in the baseline economy is $\bar{W}_t = \bar{P}_t^R \cdot \bar{Q}_t^R + \bar{P}_t^N \cdot \bar{Q}_t^N + \bar{F}_t$. Taking the difference, I have $W_t - \bar{W}_t = \bar{P}_t^R \cdot \bar{Q}_t^R \cdot p_t^R + \bar{P}_t^N \cdot \bar{Q}_t^N \cdot p_t^N + F_t - \bar{F}_t$. Dividing it by $\bar{W}_t$ gives

$$w_t = \theta^R \cdot p_t^R + \theta^N \cdot p_t^N + f_t. \tag{B.5}$$

From Equation A.11, the demand for the repurchasing firm is $Q_t^{R,D} = \theta \cdot \frac{W_t}{P_t^R} \cdot \exp\big(\kappa^R \cdot \hat{\pi}_t^R + \kappa^{RN} \cdot \hat{\pi}_t^N + \tau \cdot (p_t^R - p_t^N)\big)$, which in the baseline economy is $\bar{Q}_t^{R,D} = \frac{\bar{W}_t}{\bar{P}_t^R}$. Dividing and log-linearizing give

$$q_t^{R,D} = -(1-\theta^R-\tau)\cdot p_t^R + (\theta^N - \tau)\cdot p_t^N + \kappa^R \cdot \hat{\pi}_t^R + \kappa^{RN} \cdot \hat{\pi}_t^N + f_t. \tag{B.6}$$

From Equation A.12, the demand for the repurchasing firm is $Q_t^{N,D} = \theta \cdot \frac{W_t}{P_t^N} \cdot \exp\big(\kappa^{NR} \cdot \hat{\pi}_t^R + \kappa^N \cdot \hat{\pi}_t^N + \tau \cdot (p_t^N - p_t^R)\big)$, which in the baseline economy is $\bar{Q}_t^{N,D} = \frac{\bar{W}_t}{\bar{P}_t^N}$. Dividing and log-linearizing give

$$q_t^{N,D} = (\theta^R - \tau) \cdot p_t^R - (1 - \theta^N - \tau) \cdot p_t^N + \kappa^{NR} \cdot \hat{\pi}_t^R + \kappa^N \cdot \hat{\pi}_t^N + f_t. \tag{B.7}$$

Plugging Equation B.1 in Equations B.6 and B.7 with $d_t^i = 0$ yields Equation A.13.

B.2.4 Proof of Proposition 4

Setting $q_t^D = 0$ in Equation A.13 gives

$$p_t = (\zeta + \kappa)^{-1} f_t + (1 + \rho)^{-1} \mathbb{E}_t\big[p_{t+1}\big]. \tag{B.8}$$

where $\rho = \kappa^{-1}\zeta$. Solving Equation B.8 iteratively yields Equation A.14.

B.2.5 Proof of A.17 and A.18

Given $Q_t^{\mathcal{S}}$, the fund has the dollar amount of proceeds $P_t^R \cdot \big(Q_t^{\mathcal{S}} - \bar{Q}_t^{\mathcal{S}}\big) + \bar{P}_t^R \cdot \bar{Q}_t^{\mathcal{S}}$ from the sales. Since the baseline amount of proceeds is $\bar{P}_t^R \cdot \bar{Q}_t^{\mathcal{S}}$, the amount of proceeds in excess of the baseline is $P_t^R \cdot \big(Q_t^{\mathcal{S}} - \bar{Q}_t^{\mathcal{S}}\big)$. Dividing it by W_t gives

$$f_{t+1}^N = \theta^R \cdot q_t^{\mathcal{S}} \big(1 + p_t^R\big). \tag{B.9}$$

Equation B.9 represents flows into (out of) the non-repurchasing (repurchasing) firm. In addition, the market clearing for the repurchasing firm is given by $q_t^{R,D} = -q_t^{\mathcal{S}}$, while the non-repurchasing firm has no supply shocks (i.e., $q_t^{N,D} = 0$). Plugging it into Equation A.13, $q_t^{\mathcal{S}}$ translates into inflows in the repurchasing firm in equilibrium. Combining $q_t^{\mathcal{S}}$ with the outflows from Equation B.9 gives

$$f_t^R = q_t^{\mathcal{S}} - \theta^R \cdot q_t^{\mathcal{S}} \cdot (1 + p_t^R). \tag{B.10}$$

Appendix C   Additional Empirical Results

Table A.I. Share Repurchases and Stock Market Returns During Periods of High Repurchase Activity

The table reports the relationship between repurchases and market returns in a subsample with high repurchase activity. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: All Firms

	Market return (t)							
Repurchases (t)	-22.79***	-20.44***						
	(-3.67)	(-3.50)						
GIV (t)			5.78	2.06				
			(0.55)	(0.18)				
Repurchases (t-1)					15.72**	10.89		
					(2.25)	(1.61)		
GIV (t-1)							19.41***	29.92***
							(2.66)	(3.68)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.154	0.329	0.004	0.089	0.064	0.238	0.087	0.244

Panel B: Repurchasing Firms

	Market return (t)							
Repurchases (t)	-20.76***	-18.20***						
	(-3.22)	(-2.96)						
GIV (t)			5.16	-0.88				
			(0.49)	(-0.08)				
Repurchases (t-1)					14.38**	10.14		
					(2.00)	(1.45)		
GIV (t-1)							18.98**	27.85***
							(2.58)	(3.39)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.123	0.284	0.003	0.102	0.051	0.217	0.083	0.235

Panel C: Non-repurchasing Firms

	Market return (t)							
Repurchases (t)	-23.78***	-21.43***						
	(-3.51)	(-3.31)						
GIV (t)			5.24	1.97				
			(0.45)	(0.15)				
Repurchases (t-1)					19.25**	14.33*		
					(2.56)	(1.94)		
GIV (t-1)							20.48**	30.57***
							(2.51)	(3.30)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.143	0.299	0.003	0.075	0.081	0.230	0.078	0.206

Table A.II. Share Repurchases and Stock Market Returns During Periods of Low Repurchase Activity

The table reports the relationship between repurchases and market returns in a subsample with low repurchase activity. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: All Firms

	Market return (t)							
Repurchases (t)	-27.04*	-35.73**						
	(-1.95)	(-2.27)						
GIV (t)			7.61	22.65				
			(0.52)	(1.49)				
Repurchases (t-1)					22.16**	26.78**		
					(2.05)	(2.37)		
GIV (t-1)							9.64	8.76
							(1.08)	(0.93)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.049	0.128	0.004	0.164	0.054	0.134	0.016	0.147

Panel B: Repurchasing Firms

	Market return (t)							
Repurchases (t)	-33.94**	-39.62**						
	(-2.58)	(-2.62)						
GIV (t)			6.81	18.69				
			(0.47)	(1.24)				
Repurchases (t-1)					22.70**	28.65**		
					(2.18)	(2.63)		
GIV (t-1)							4.76	2.57
							(0.54)	(0.28)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.082	0.140	0.003	0.163	0.060	0.141	0.004	0.144

Panel C: Non-repurchasing Firms

	Market return (t)							
Repurchases (t)	-34.49**	-41.84**						
	(-2.13)	(-2.26)						
GIV (t)			8.25	26.97				
			(0.49)	(1.55)				
Repurchases (t-1)					24.73*	31.61**		
					(1.95)	(2.38)		
GIV (t-1)							7.35	8.03
							(0.71)	(0.74)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	76	76	76	76	76	76	76	76
R-squared	0.058	0.122	0.003	0.176	0.049	0.129	0.007	0.153

Table A.III. Share Repurchases and Stock Market Returns: Evidence of Reversals

The table presents an analysis of return reversals. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. Repurchases and GIV are constructed following Equations 2 and 3.

Panel A: All Firms

	Market return (t)							
Repurchases (t-2)	-0.41	2.19						
	(-0.07)	(0.37)						
GIV (t-2)			-2.17	-2.47				
			(-0.38)	(-0.40)				
Repurchases (t-3)					-0.77	0.66		
					(-0.14)	(0.11)		
GIV (t-3)							-3.34	-4.07
							(-0.61)	(-0.69)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.000	0.062	0.001	0.084	0.000	0.061	0.002	0.086

Panel B: Repurchasing Firms

	Market return (t)							
Repurchases (t-2)	-0.44	1.19						
	(-0.08)	(0.20)						
GIV (t-2)			-2.41	-4.38				
			(-0.43)	(-0.72)				
Repurchases (t-3)					0.11	0.87		
					(0.02)	(0.15)		
GIV (t-3)							-1.98	-3.86
							(-0.36)	(-0.66)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.000	0.056	0.001	0.086	0.000	0.055	0.001	0.085

Panel C: Non-repurchasing Firms

	Market return (t)							
Repurchases (t-2)	-0.01	3.15						
	(-0.00)	(0.46)						
GIV (t-2)			-1.57	-1.37				
			(-0.24)	(-0.20)				
Repurchases (t-3)					-1.49	0.24		
					(-0.23)	(0.04)		
GIV (t-3)							-3.58	-4.54
							(-0.57)	(-0.67)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	152	152	152	152	152	152	152	152
R-squared	0.000	0.059	0.000	0.077	0.000	0.057	0.002	0.080

Table A.IV. Share Repurchases and Contemporaneous Flows to Growth and Value Firms

The table reports the relationship between share repurchases and flows to the HML factor. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: Contemporaneous Flows (Full Sample)

	Flow (value minus growth, t)			
Repurchases (value minus growth, t)	-0.34			
	(-0.73)			
Repurchases (growth, t)		2.77***		
		(2.66)		
Repurchases (value, t)		-0.35		
		(-0.76)		
GIV (value minus growth, t)			-0.74*	
			(-1.80)	
GIV (growth, t)				1.21
				(1.53)
GIV (value, t)				-0.48
				(-0.85)
Observations	152	152	152	152
R-squared	0.004	0.047	0.021	0.024

Panel B: Contemporaneous Flows (Higher Repurchase Periods for Growth Firms)

	Flow (value minus growth, t)			
Repurchases (value minus growth, t)	-1.83*			
	(-1.79)			
Repurchases (growth, t)		2.59		
		(1.60)		
Repurchases (value, t)		-1.78*		
		(-1.74)		
GIV (value minus growth, t)			0.78	
			(0.88)	
GIV (growth, t)				-1.48
				(-1.54)
GIV (value, t)				-0.79
				(-0.63)
Observations	76	76	76	76
R-squared	0.042	0.047	0.010	0.049

Panel C: Contemporaneous Flows (Higher Repurchase Periods for Value Firms)				
	Flow (value minus growth, t)			
Repurchases (value minus growth, t)	1.05			
	(1.44)			
Repurchases (growth, t)		1.97		
		(1.27)		
Repurchases (value, t)		0.87		
		(1.22)		
GIV (value minus growth, t)			-0.11	
			(-0.15)	
GIV (growth, t)				2.75
				(1.54)
GIV (value, t)				0.40
				(0.53)
Observations	76	76	76	76
R-squared	0.027	0.087	0.000	0.034

Table A.V. HML Returns

The table reports the relationship between share repurchases and HML returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML (Full Sample)

	HML (t)			
Repurchases (value minus growth, t-1)	0.81			
	(0.32)			
Repurchases (growth, t-1)		-10.33*		
		(-1.82)		
Repurchases (value, t-1)		0.83		
		(0.33)		
GIV (value minus growth, t-1)			3.80	
			(1.64)	
GIV (growth, t-1)				-4.73
				(-1.12)
GIV (value, t-1)				3.22
				(0.99)
Observations	152	152	152	152
R-squared	0.001	0.024	0.018	0.018

Panel B: HML (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t-1)	3.63			
	(0.93)			
Repurchases (growth, t-1)		-21.13***		
		(-3.10)		
Repurchases (value, t-1)		2.86		
		(0.77)		
GIV (value minus growth, t-1)			5.99**	
			(2.42)	
GIV (growth, t-1)				-12.58**
				(-2.34)
GIV (value, t-1)				3.26
				(1.03)
Observations	76	76	76	76
R-squared	0.012	0.124	0.073	0.097

Panel C: HML (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t-1)	-0.23			
	(-0.06)			
Repurchases (growth, t-1)		-2.66		
		(-0.29)		
Repurchases (value, t-1)		-0.12		
		(-0.03)		
GIV (value minus growth, t-1)			-2.18	
			(-0.50)	
GIV (growth, t-1)				1.89
				(0.30)
GIV (value, t-1)				-2.57
				(-0.34)
Observations	76	76	76	76
R-squared	0.000	0.002	0.003	0.003

Table A.VI. HML Returns Constructed from Repurchasing Firms

The table reports the relationship between share repurchases and HML returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML from Repurchasing Firms (Full Sample)

	HML (t)			
Repurchases (value minus growth, t-1)	0.28			
	(0.10)			
Repurchases (growth, t-1)		0.53		
		(0.08)		
Repurchases (value, t-1)		0.28		
		(0.10)		
GIV (value minus growth, t-1)			-0.34	
			(-0.13)	
GIV (growth, t-1)				4.64
				(0.97)
GIV (value, t-1)				2.40
				(0.66)
Observations	152	152	152	152
R-squared	0.000	0.000	0.000	0.008

Panel B: HML from Repurchasing Firms (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t-1)	1.87			
	(0.40)			
Repurchases (growth, t-1)		-10.87		
		(-1.25)		
Repurchases (value, t-1)		1.48		
		(0.31)		
GIV (value minus growth, t-1)			1.05	
			(0.34)	
GIV (growth, t-1)				-0.45
				(-0.07)
GIV (value, t-1)				1.30
				(0.32)
Observations	76	76	76	76
R-squared	0.002	0.023	0.002	0.002

Panel C: HML from Repurchasing Firms (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t-1)	1.70			
	(0.42)			
Repurchases (growth, t-1)		5.92		
		(0.60)		
Repurchases (value, t-1)		1.41		
		(0.35)		
GIV (value minus growth, t-1)			-4.28	
			(-0.90)	
GIV (growth, t-1)				9.16
				(1.36)
GIV (value, t-1)				2.40
				(0.30)
Observations	76	76	76	76
R-squared	0.002	0.012	0.011	0.025

Table A.VII. HML Returns (Contemporaneous)

The table reports the relationship between share repurchases and HML returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML (Full Sample)

	HML (t)			
Repurchases (value minus growth, t)	-1.15			
	(-0.46)			
Repurchases (growth, t)		3.08		
		(0.54)		
Repurchases (value, t)		-1.15		
		(-0.46)		
GIV (value minus growth, t)			-1.97	
			(-0.89)	
GIV (growth, t)				5.38
				(1.27)
GIV (value, t)				-0.04
				(-0.01)
Observations	152	152	152	152
R-squared	0.001	0.002	0.005	0.011

Panel B: HML (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t)	-8.59			
	(-1.64)			
Repurchases (growth, t)		9.91		
		(1.19)		
Repurchases (value, t)		-8.52		
		(-1.61)		
GIV (value minus growth, t)			1.81	
			(0.33)	
GIV (growth, t)				-3.38
				(-0.56)
GIV (value, t)				-1.69
				(-0.21)
Observations	76	76	76	76
R-squared	0.035	0.036	0.001	0.007

Panel C: HML (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t)	0.35			
	(0.08)			
Repurchases (growth, t)		1.45		
		(0.16)		
Repurchases (value, t)		0.25		
		(0.06)		
GIV (value minus growth, t)			1.82	
			(0.51)	
GIV (growth, t)				7.22
				(0.79)
GIV (value, t)				3.56
				(0.92)
Observations	76	76	76	76
R-squared	0.000	0.001	0.004	0.019

Table A.VIII. HML Returns Constructed from Repurchasing Firms (Contemporaneous)

The table reports the relationship between share repurchases and HML returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML from Repurchasing Firms (Full Sample)

	HML (t)			
Repurchases (value minus growth, t)	-3.42			
	(-1.21)			
Repurchases (growth, t)		1.00		
		(0.16)		
Repurchases (value, t)		-3.42		
		(-1.21)		
GIV (value minus growth, t)			-2.66	
			(-1.06)	
GIV (growth, t)				5.02
				(1.05)
GIV (value, t)				-1.32
				(-0.39)
Observations	152	152	152	152
R-squared	0.010	0.011	0.007	0.010

Panel B: HML from Repurchasing Firms (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t)	0.06			
	(0.01)			
Repurchases (growth, t)		1.35		
		(0.13)		
Repurchases (value, t)		0.14		
		(0.02)		
GIV (value minus growth, t)			-0.70	
			(-0.11)	
GIV (growth, t)				2.00
				(0.27)
GIV (value, t)				2.23
				(0.23)
Observations	76	76	76	76
R-squared	0.000	0.000	0.000	0.003

Panel C: HML from Repurchasing Firms (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t)	-2.08			
	(-0.47)			
Repurchases (growth, t)		-3.56		
		(-0.36)		
Repurchases (value, t)		-1.75		
		(-0.39)		
GIV (value minus growth, t)			-1.33	
			(-0.35)	
GIV (growth, t)				3.91
				(0.39)
GIV (value, t)				-0.84
				(-0.20)
Observations	76	76	76	76
R-squared	0.003	0.009	0.002	0.003

Table A.IX. HML Returns Constructed from Non-Repurchasing Firms (Contemporaneous)

The table reports the relationship between share repurchases and HML returns. I define a firm as a repurchasing firm if its quarterly share repurchases are positive. Other firms are classified as non-repurchasing firms. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 5, 6, 7, 8, and 9.

Panel A: HML from Non-Repurchasing Firms (Full Sample)

	HML (t)			
Repurchases (value minus growth, t)	-1.01			
	(-0.35)			
Repurchases (growth, t)		6.05		
		(0.91)		
Repurchases (value, t)		-1.02		
		(-0.35)		
GIV (value minus growth, t)			-3.59	
			(-1.39)	
GIV (growth, t)				7.96
				(1.62)
GIV (value, t)				-1.11
				(-0.32)
Observations	152	152	152	152
R-squared	0.001	0.006	0.013	0.020

Panel B: HML from Non-Repurchasing Firms (Higher Repurchase Periods for Growth Firms)

	HML (t)			
Repurchases (value minus growth, t)	-7.80			
	(-1.29)			
Repurchases (growth, t)		10.01		
		(1.04)		
Repurchases (value, t)		-7.67		
		(-1.26)		
GIV (value minus growth, t)			4.27	
			(0.65)	
GIV (growth, t)				-6.12
				(-0.84)
GIV (value, t)				0.15
				(0.02)
Observations	76	76	76	76
R-squared	0.022	0.023	0.006	0.010

Panel C: HML from Non-Repurchasing Firms (Higher Repurchase Periods for Value Firms)				
	HML (t)			
Repurchases (value minus growth, t)	1.85			
	(0.38)			
Repurchases (growth, t)		4.02		
		(0.38)		
Repurchases (value, t)		1.51		
		(0.31)		
GIV (value minus growth, t)			0.00	
			(0.00)	
GIV (growth, t)				15.09
				(1.48)
GIV (value, t)				2.91
				(0.67)
Observations	76	76	76	76
R-squared	0.002	0.007	0.000	0.034

Table A.X. Share Repurchases and Contemporaneous Flows to Big and Small Firms

The table reports the relationship between share repurchases and flows to the SMB factor. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: Contemporaneous Flows (Full Sample)

	Flow (small minus big, t)			
Repurchases (small minus big, t)	-0.52			
	(-0.69)			
Repurchases (big, t)		0.26		
		(0.35)		
Repurchases (small, t)		-1.91*		
		(-1.83)		
GIV (small minus big, t)			-0.46	
			(-0.63)	
GIV (big, t)				-0.17
				(-0.21)
GIV (small, t)				-2.47*
				(-1.72)
Observations	152	152	152	152
R-squared	0.003	0.026	0.003	0.020

Panel B: Contemporaneous Flows (Higher Repurchase Periods for Big Firms)

	Flow (small minus big, t)			
Repurchases (small minus big, t)	-0.89			
	(-0.96)			
Repurchases (big, t)		0.80		
		(0.88)		
Repurchases (small, t)		-2.73**		
		(-2.05)		
GIV (small minus big, t)			0.75	
			(0.58)	
GIV (big, t)				-0.73
				(-0.58)
GIV (small, t)				-3.86
				(-1.45)
Observations	76	76	76	76
R-squared	0.012	0.058	0.005	0.054

Panel C: Contemporaneous Flows (Higher Repurchase Periods for Small Firms)				
	Flow (small minus big, t)			
Repurchases (small minus big, t)	-3.58*			
	(-1.84)			
Repurchases (big, t)		3.13		
		(1.53)		
Repurchases (small, t)		-4.20*		
		(-1.99)		
GIV (small minus big, t)			-0.85	
			(-0.39)	
GIV (big, t)				0.52
				(0.21)
GIV (small, t)				-1.28
				(-0.49)
Observations	76	76	76	76
R-squared	0.044	0.051	0.002	0.003

Table A.XI. SMB Returns

The table reports the relationship between share repurchases and SMB returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB (Full Sample)

	SMB (t)			
Repurchases (small minus big, t-1)	1.05			
	(0.42)			
Repurchases (big, t-1)		-0.08		
		(-0.03)		
Repurchases (small, t-1)		6.26*		
		(1.79)		
GIV (small minus big, t-1)			2.75	
			(1.07)	
GIV (big, t-1)				-2.35
				(-0.80)
GIV (small, t-1)				3.92
				(0.81)
Observations	152	152	152	152
R-squared	0.001	0.030	0.008	0.008

Panel B: SMB (Higher Repurchase Periods for Big Firms)

	SMB (t)			
Repurchases (small minus big, t-1)	-1.30			
	(-0.45)			
Repurchases (big, t-1)		2.78		
		(0.94)		
Repurchases (small, t-1)		3.08		
		(0.81)		
GIV (small minus big, t-1)			0.66	
			(0.20)	
GIV (big, t-1)				0.67
				(0.18)
GIV (small, t-1)				4.29
				(0.71)
Observations	76	76	76	76
R-squared	0.003	0.042	0.001	0.008

Panel C: SMB (Higher Repurchase Periods for Small Firms)				
	SMB (t)			
Repurchases (small minus big, t-1)	5.67			
	(1.28)			
Repurchases (big, t-1)		-4.81		
		(-1.08)		
Repurchases (small, t-1)		11.19*		
		(1.76)		
GIV (small minus big, t-1)			5.18	
			(1.27)	
GIV (big, t-1)				-6.05
				(-1.26)
GIV (small, t-1)				2.77
				(0.35)
Observations	76	76	76	76
R-squared	0.022	0.041	0.021	0.023

Table A.XII. SMB Returns Constructed from Repurchasing Firms

The table reports the relationship between share repurchases and SMB returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB from Repurchasing Firms (Full Sample)

	SMB (t)			
Repurchases (small minus big, t-1)	3.22			
	(0.82)			
Repurchases (big, t-1)		-1.91		
		(-0.49)		
Repurchases (small, t-1)		10.28*		
		(1.87)		
GIV (small minus big, t-1)			3.48	
			(0.86)	
GIV (big, t-1)				-2.30
				(-0.50)
GIV (small, t-1)				6.94
				(0.91)
Observations	152	152	152	152
R-squared	0.005	0.026	0.005	0.007

Panel B: SMB from Repurchasing Firms (Higher Repurchase Periods for Big Firms)

	SMB (t)			
Repurchases (small minus big, t-1)	-2.43			
	(-0.61)			
Repurchases (big, t-1)		4.07		
		(0.98)		
Repurchases (small, t-1)		2.42		
		(0.45)		
GIV (small minus big, t-1)			1.10	
			(0.23)	
GIV (big, t-1)				2.16
				(0.40)
GIV (small, t-1)				10.01
				(1.16)
Observations	76	76	76	76
R-squared	0.005	0.030	0.001	0.021

Panel C: SMB from Repurchasing Firms (Higher Repurchase Periods for Small Firms)				
	SMB (t)			
Repurchases (small minus big, t-1)	13.80*			
	(1.91)			
Repurchases (big, t-1)		-12.46*		
		(-1.71)		
Repurchases (small, t-1)		22.48**		
		(2.17)		
GIV (small minus big, t-1)			6.67	
			(0.99)	
GIV (big, t-1)				-8.61
				(-1.09)
GIV (small, t-1)				1.36
				(0.10)
Observations	76	76	76	76
R-squared	0.047	0.064	0.013	0.016

Table A.XIII. SMB Returns (Contemporaneous)

The table reports the relationship between share repurchases and SMB returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB (Full Sample)

	SMB (t)			
Repurchases (small minus big, t)	-3.15			
	(-1.26)			
Repurchases (big, t)		1.21		
		(0.51)		
Repurchases (small, t)		-13.80***		
		(-4.15)		
GIV (small minus big, t)			1.45	
			(0.59)	
GIV (big, t)				-2.78
				(-0.99)
GIV (small, t)				-2.77
				(-0.57)
Observations	152	152	152	152
R-squared	0.011	0.130	0.002	0.009

Panel B: SMB (Higher Repurchase Periods for Big Firms)

	SMB (t)			
Repurchases (small minus big, t)	-0.41			
	(-0.12)			
Repurchases (big, t)		0.13		
		(0.04)		
Repurchases (small, t)		-6.30		
		(-1.29)		
GIV (small minus big, t)			3.93	
			(0.90)	
GIV (big, t)				-3.92
				(-0.89)
GIV (small, t)				1.43
				(0.15)
Observations	76	76	76	76
R-squared	0.000	0.036	0.011	0.012

Panel C: SMB (Higher Repurchase Periods for Small Firms)				
	SMB (t)			
Repurchases (small minus big, t)	-7.64			
	(-1.19)			
Repurchases (big, t)		0.25		
		(0.04)		
Repurchases (small, t)		-17.88***		
		(-2.86)		
GIV (small minus big, t)			5.03	
			(0.69)	
GIV (big, t)				-8.40
				(-1.03)
GIV (small, t)				0.61
				(0.07)
Observations	76	76	76	76
R-squared	0.019	0.213	0.006	0.018

Table A.XIV. SMB Returns Constructed from Repurchasing Firms (Contemporaneous)

The table reports the relationship between share repurchases and SMB returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB from Repurchasing Firms (Full Sample)				
	SMB (t)			
Repurchases (small minus big, t)	-7.30*			
	(-1.88)			
Repurchases (big, t)		4.18		
		(1.13)		
Repurchases (small, t)		-24.32***		
		(-4.71)		
GIV (small minus big, t)			0.16	
			(0.04)	
GIV (big, t)				-2.01
				(-0.46)
GIV (small, t)				-5.71
				(-0.75)
Observations	152	152	152	152
R-squared	0.023	0.147	0.000	0.005

Panel B: SMB from Repurchasing Firms (Higher Repurchase Periods for Big Firms)				
	SMB (t)			
Repurchases (small minus big, t)	-1.95			
	(-0.41)			
Repurchases (big, t)		1.38		
		(0.30)		
Repurchases (small, t)		-14.05**		
		(-2.11)		
GIV (small minus big, t)			3.31	
			(0.53)	
GIV (big, t)				-3.27
				(-0.52)
GIV (small, t)				-8.48
				(-0.64)
Observations	76	76	76	76
R-squared	0.002	0.080	0.004	0.017

Panel C: SMB from Repurchasing Firms (Higher Repurchase Periods for Small Firms)				
	SMB (t)			
Repurchases (small minus big, t)	-18.68*			
	(-1.79)			
Repurchases (big, t)		8.14		
		(0.80)		
Repurchases (small, t)		-33.30***		
		(-3.17)		
GIV (small minus big, t)			6.66	
			(0.56)	
GIV (big, t)				-8.91
				(-0.66)
GIV (small, t)				3.72
				(0.26)
Observations	76	76	76	76
R-squared	0.041	0.186	0.004	0.006

Table A.XV. SMB Returns Constructed from Repurchasing Firms (Contemporaneous)

The table reports the relationship between share repurchases and SMB returns. I classify stocks into six categories based on market capitalization and book-to-market ratios, following Fama and French (1993): large growth, large blend, large value, small growth, small blend, and small value. Flows, repurchases, and GIVs are constructed following Equations 10, 11, 12, 13, and 14.

Panel A: SMB from Non-Repurchasing Firms (Full Sample)

	SMB (t)			
Repurchases (small minus big, t)	-3.10			
	(-0.98)			
Repurchases (big, t)		0.73		
		(0.24)		
Repurchases (small, t)		-16.08***		
		(-3.79)		
GIV (small minus big, t)			1.37	
			(0.44)	
GIV (big, t)				-3.37
				(-0.95)
GIV (small, t)				-4.96
				(-0.81)
Observations	152	152	152	152
R-squared	0.006	0.117	0.001	0.011

Panel B: SMB from Non-Repurchasing Firms (Higher Repurchase Periods for Big Firms)

	SMB (t)			
Repurchases (small minus big, t)	-0.14			
	(-0.04)			
Repurchases (big, t)		-0.19		
		(-0.05)		
Repurchases (small, t)		-7.05		
		(-1.30)		
GIV (small minus big, t)			5.82	
			(1.06)	
GIV (big, t)				-5.81
				(-1.05)
GIV (small, t)				3.98
				(0.34)
Observations	76	76	76	76
R-squared	0.000	0.040	0.015	0.015

Panel C: SMB from Non-Repurchasing Firms (Higher Repurchase Periods for Small Firms)				
	SMB (t)			
Repurchases (small minus big, t)	-8.59			
	(-0.99)			
Repurchases (big, t)		-0.52		
		(-0.06)		
Repurchases (small, t)		-21.24**		
		(-2.46)		
GIV (small minus big, t)			9.95	
			(1.09)	
GIV (big, t)				-15.64
				(-1.53)
GIV (small, t)				2.51
				(0.23)
Observations	76	76	76	76
R-squared	0.013	0.176	0.016	0.036