Cash Induced Demand*

Huaizhi Chen
University of Notre Dame

Current Draft: January 26, 2022

* Contact at hchen11@nd.edu, 574-631-3385. I thank Malcolm Baker, Robert Battalio, Susan Christoffersen, Lauren Cohen, Zhi Da, Paul Gao, Robin Greenwood, Shiyang Huang, Markus Ibert, Tim Loughran, Dong Lou, Christopher Malloy, Christopher Polk, Sophie Shive, Andrei Shleifer, Erik Stafford, Rene Stulz, and Luis Viceira for their valuable comments and suggestions. I would also like to thank the participants at AFA 2019, American University, AQR Capital Management, the FMA Asia Conference, Northeastern University, Ohio State University, University of Delaware, the Southern Finance Association Conference, Midwest Finance Association Conference, and University of Notre Dame for their valuable input. Furthermore, I like to thank the editor and the referee for their substantial feedback. A large part of this research was conducted during my post-doctoral fellowship supported by the Behavioral Finance and Financial Stability Initiative at Harvard Business School. This paper was previously circulated as "Capital Redeployment in the Equity Market."

Cash Induced Demand

ABSTRACT

I show that cash distributions through cash-mergers, dividend payments, and stock buybacks are in principal similar to investor fund flows in generating demands for investable assets. Abnormal returns in certain assets can be forecasted because delegated investors predictably reinvest cash-returns toward certain holdings. Novel measures of stock level demand constructed using proportional reinvestments by mutual funds predicts abnormal returns and issuances in non-cash paying stocks. These results highlight an alternative and substantial source of price fluctuations in the cross-section of equities.

JEL Classification: G10, G14, G23, G31, G34 and G35.

Keywords: Mutual Funds, Mergers, Payout Policy, Dividend Policy, Stock Buyback, and Spillover Effects.

There is a large and growing literature in financial economics interested in identifying demand driven price pressure as the source of fluctuations in asset prices (Gabaix and Koijen 2020). While this literature typically uses investor flows into asset managers as the main source of asset demand, in this paper, I show that cash payouts from public firms form a substantial basis of demand for investable assets. As can be seen in Figure 1, in 2016 alone, publicly listed companies distributed almost one trillion dollars through dividends and stock buybacks. In contrast, investment flows to delegated mutual funds, aggregate to a much lower magnitude- the total annual investor capital flow to mutual funds added up to no more than 400 billion dollars across the sample period. In accordance to the demand view of price fluctuations, these large aggregate cash payouts to investors, under limited arbitrage[1], should drive substantial predictability in asset prices.

I examine the three types of events through which portfolios face potentially large cash distributions that need reinvestment- These are cash financed mergers, dividend payments, and asset buyback programs. By exposing the details of these cash programs, I show that the mechanical reinvestment of cash returns into assets are in principal similar to investor flows into delegated asset managers.

This examination of cash-distributions as a source of asset price fluctuations offer several contributions to the financial literature. First, utilizing cash distributions from existing holdings may alleviate some of the identification concerns of the relationship between investor flows and prices. The economic factors that drive large cash returns (the largest firms typically make the vast majority of the total cash-distributions) are likely different from the existing factors involved in excess stock returns, especially when I limit the analysis to stocks that do not conduct cash-returns.

[1] See (Shleifer and Vishny 1992), (Shleifer and Vishny 1997), and (Greenwood 2005).

Additionally, many reinvestment programs for distribution are automatic[2] and individually small, easing concerns of endogenous cash-management decisions in mutual fund portfolios with large variable investor flows. Second, this analysis present additional evidences on the dynamics of demand driven predictability. The typical return pattern in investor flow-driven price pressure occurs with a positive run up in the prices of the stocks coinciding with investor flows and then a longer term reversal. Wardlaw (2020) criticizes the reversal pattern as characteristic of the momentum and size factors that are embedded in the measure's construction. The price pressure measurement constructed from cash-distributions is likely not subjected to the same criticism, as the measure itself does not load positively on past returns nor does it pick up stocks characterized by small size[3]. This cash-induced demand measurement is associated with positive return predictability- measuring $4.52 of price impact per dollar of cash-returns. However unlike investor flow driven price impact, this expected price pressure of dividends and buybacks is not associated with significant reversals. In fact, the stock that are most exposed to payout cash flows also tend to persistently issue equity relative than less exposed stocks. This persistent issuance pattern indicates that cash reinvestments through the equity market relaxes financing constraints in the cross section of equities, generates price effects that are actively arbitraged by firms, or both.

Ultimately, the cash-induced demand documented in the paper offers a substantial alternative source of cash-inflow driven investments, and effectively serves as a tool of external validation and an "out-of-sample" test of the demand driven fluctuation hypothesis.

[2] Mutual fund investors can elect to participate in automatic reinvestment programs. In Appendix A2, I estimate that 84.7% percentage of measured mutual fund distributions are automatically reinvested in the fund portfolio.
[3] The *CID* measure used in the main text has a -17.05% correlation with past 12 month returns, and a 2.77% correlation with a stock's log market cap.

The main body of the paper is organized as follows. First, I use mergers as clean laboratories to examine the timing of purchase decisions and subsequent price fluctuations that are associated with cash-return from assets. During a cash merger, a target is delisted and its shares are exchanged for cash. I show that the investors who receive these cash windfalls tend to reinvest in other assets almost immediately after the distribution- that is if investors conduct any cash management around these events, cash distributions still end up affecting the timing of their reinvestment decisions. The shareholders of the merged targets substantially increase their purchases of other stocks only after the cash payment date relative to non-shareholders. Institutional investors holding the delisted stock increase their daily net trading activity by roughly 2.80% (4.39%) in the 10 trading days after the 100 (30) largest cash mergers. Importantly, this effect is absent for stock-financed mergers, and therefore likely is not driven by changes in investor expectations or discretionary investment-management due to the completion of a merger deal. The re-investment decisions are followed with a pattern of excess returns that is consistent with price predictability. A stock purchased by cash return deploying investors on average accumulate contemporaneous returns of 85 basis points ($t = 5.45$). However, these returns do partially revert- the same stocks experience excess returns of -52 basis points ($t = -2.76$) in the next 60 trading days, and -68 basis points ($t = -2.39$) the 60 trading days after. These results are also robust to controlling for a set of common characteristics, as well as to alternative measures of reinvestment demand. The targets of cash-redeploying demand centers on a specific cross-section of stocks characterized by high institutional ownership, low book, and high market values. Overall, these results indicate that reinvestments are likely mechanical results of cash-returns; that these reinvestments target a specific cross-section of equities; and that there are event time price impacts associated with these targets.

With evidence on the timing and the mechanism of reinvestment from cash-mergers in hand, the second half of this paper examines cash returns from dividend and share repurchase programs. Unlike cash mergers, dividends and share buybacks involve smaller payments individually. Over a quarter, however, these payments aggregate for a diversified portfolio. In principle, these programs operate with the same investment demand mechanism as cash-mergers and as investor inflows. I draw on mutual fund holdings to analyze the reinvestment and return predictability associated with these channels of cash deployment. Under the assumption of mechanical reinvestment, I construct a measure of expected cash induced demand[4]. I show that this measure predicts abnormal return- high levels of expected price pressure is associated with high excess returns in non-payout stocks. Regression analysis indicates a price to reinvestment demand elasticity of roughly $4.52 of price appreciation to one dollar in cash distributions. Additionally, contrasting the existing evidence from investor flow driven price pressure, this measure doesn't substantially predict reversals subsequent to the abnormal returns- potentially due to the persistence of this demand inflow. These results are compatible with the inelasticity demand hypothesis of Gabaix and Koijen (2020).

The next section reviews the relevant literature. Section 2 describes the data used for this study and various institutional details. Section 3 examines investor demand for stocks surrounding

[4] While, the cash-redeployment mechanism likely operates in mutual funds as well as non-mutual fund holdings, mutual fund portfolios has the advantage of capturing investment mandates and style constraints. Institutional holdings may be composed of multiple portfolios- each with a separate mandate and a different group of ultimate investors. Additionally, using mutual fund portfolios facilitates comparisons to investor flow measure. However, an alternative measure of cash induced demand, constructed using institutional holdings, has 70.7% correlation with that used in the paper, and gives qualitatively similar results.

cash-merger payments. Section 4 then applies the redeployment mechanism to study payout exposure and the returns of non-payout stocks. Section 5 concludes.

1. Relevant Literature

The most popular method for identifying a source of demand driven price fluctuations is to aggregate the cash-flows from investor deposits and redemptions in mutual funds onto assets that form potential targets of the induced trades.[5] There are two implicit assumptions in this method: 1) that the investment of cash from inflows and the liquidation of assets from outflows are largely mechanical and predictably reflect the ex-ante snap-shots of mutual fund holdings, and 2) that the identified targets of this investment demand have characteristics that are at least partially orthogonal to the factors that affect investor flows. However, there are limitations in the validity of these conditions for identifying the price impact of investor flows. For instance, the discretionary cash management by fund managers will alleviate the price impact of mechanical purchases and liquidation of assets (Chernenko and Sunderam (2012); Choi, Hoseinzade, Shind and Tehraniane (2020)). Additionally, challenging the second assumption, the factors that drive investor capital flows are likely related to existing factors that affect asset prices.[6] Lastly, the flow-driven pressure measurements may be correlated to other well-known factors that affect stock returns through their construction (Wardlaw 2020), making the validation of the demand fluctuation hypothesis limited.

---

[5] See for example: Warther (1995), (Coval and Stafford 2007), (Frazzini and Lamont 2008), (Lou 2012), (Edmans, Goldstein and Jiang 2012), and (Kahn, Kogan and Serafeim 2012).

[6] For instance, return-chasing affects investor flows while momentum predictability in assets precisely is the phenomenon where past returns forecast future returns.

Given the aforementioned limitations, it is relevant for the financial literature to examine demand for equity in contexts other than investor capital flow. However, there are few alternatives available in the finance literature that offer an economically significant and comparable source of cross-sectional demand variation in the equity markets. Index inclusions and exclusions (Harris and Gurel (1986); Shleifer (1986); Kaul, Mehrotra, and Morck (2002); and Greenwood (2005)) are limited to event studies and in principal would not influence the prices of assets not subjected to these actions. Because of the evident importance of cross-sectional demand to the fluctuations in equity asset prices- (Gabaix and Koijen 2020), I examine payout cash as an alternative to mutual fund investor flows as a source of investment demand.

This paper is also a part of a growing literature that investigates the treatment of dividend and returns by investors. See, for example, Hartzmark and Solomon (2017) and Di Maggio, Kermani, and Majlesi (2018). This research broadly finds that investors treat dividend returns differently from price returns. Hartzmark and Solomon (2017) calls the phenomenon the dividend disconnect, and document that non-dividend paying stocks experience abnormal returns following large dividend payments. In Swedish household data, Di Maggio, Kermani, and Majlesi (2018) find that individuals are more likely to consume dividend income than to consume capital appreciation. I find that exposure to dividend and buyback programs is a persistent and variable characteristic of asset manager portfolios that relates to asset allocation. Stocks exposed to this source of investor demand are a predictable cross section of equity assets.

Payout policy is central to corporate finance. A well-developed literature focuses on payouts from the perspective of the firm. Managers initiate stock repurchases (stock issuance) when they believe their firms are undervalued (overvalued) or when there is manager-investor incentive misalignment. See Loughran and Ritter (1995); Stephens and Weisbach (1998); Baker and Wurgler (2000); Kahle (2002); Cook, Krigman and Leach (2003); Hong, Wang and Yu (2008); Greenwood and Hanson (2012); and Dittmar and Field (2015). One potential issue with measures of payout exposure is that individual firms time stock repurchase. However, when aggregated at the portfolio level, investor exposures to repurchase dollars are extremely persistent. In other words, when repurchasing dollars from public firms are grouped into a large diversified portfolio, the cash flow is extremely smooth and predictable. There is also evidence that the substantial aggregate variation of repurchases is to repay investors Jagannathan, Stephens, and Weisbach (2000), and Grullon and Michaely (2002). I focus on the use of this cash flow, and its effect on stocks that do not conduct payouts.

2. Data and Institutional Details of Cash Mergers, Dividends, and Buybacks

My analysis relies on two datasets that capture trading by institutional investors. The first is the set of trades in individual institutional client accounts from ANcerno (also known as Abel Noser Corp).[7] The second is the standard quarterly holdings by mutual fund and institutional portfolios from CDA/Spectrum. The ANcerno data contain trading disclosures from a large range of institutional clients between Q1 1999 and Q3 2011- after which ANcerno stopped releasing data disaggregated by individual client portfolios. These clients provide the individual trades of their account managers for transaction cost analysis.[8] The mutual fund and institutional portfolio data come from standard regulatory disclosure forms required by the SEC and collected by

[7] See for example, Puckett and Yan (2011) and Hu, Jo, Wang and Xie (2018) for a more detailed description of the dataset.
[8] According to Hu, Jo, Wang and Xie (2018), investment managers and pension plan sponsors are the primary clients that released these trade records.

CDA/Spectrum. This set of funds is matched to the Center for Research in Security Prices (CRSP) dataset of fund characteristics for the period between 1990 and 2016. Stock return and firm characteristic data come from CRSP and Compustat, respectively. The universe of stocks consists of common US equity, traded on the NYSE, NASDAQ, and AMEX, with market capitalization greater than the bottom 10% of the NYSE.

I first analyze the activities of institutional investors around cash merger events. After a merger announcement, the involved parties apply to regulators for approval. In the case of an approval, payment to investors and the closing of a deal occur shortly after. The initial merger announcement day returns are widely studied in the empirical literature (see, for example, Mitchell, Pulvino and Stafford (2004)). The final payment of cash mergers will affect the level of cash holdings while staying invariant to the total value of a portfolio. The largest cash-financed merger in my sample period exchanged over $50 billion worth of stocks for cash within a single day. As a point of reference, the average daily volume of the NASDAQ composite was slightly over $100 billion in the same period. I use the largest of these payment events to identify the effect of cash payments in driving investor demand.

Unlike cash mergers, dividend payments are minuscule at daily intervals; however, they aggregate over time to represent a significant source of cash injection. Dividends also do not change the total value of an investor portfolio; a portfolio that holds a stock on its ex-dividend date, receives an allocation equal in value to the distributed amount. This offsets the reduction in the value of asset holdings (stock prices adjust to the ex-dividend price). The dividends clearing is usually after the ex-dividend date. Despite the lag in the clearing, the investor is immediately credited the value of the cash dividend itself.

Finally, in a share buyback, firms also give cash to investors, although these events involve investor discretionary choice. Over 95% of share buybacks occur through open-market operations. A firm first announces its intention to conduct a repurchase program; focusing largely on the size and term of the program. Firms typically have considerable discretion in the actual purchase. Open-market repurchases occur over years. Investors have no public information regarding their precise timing, and generally only observe the ex-post changes in a firm's shares outstanding. While only some funds may elect to sell in a stock buyback, a firm's buyback of stocks will ultimately and certainly transfer cash to the investors that had held the stock prior to the buyback. The expected cash flow to each portfolio from a buyback operation can be calculated without knowing which investors will participate. The percentage decline in aggregate mutual fund holdings corresponds roughly one-to-one with the percentage reduction in the shares outstanding of firms during a quarter, and this expected decline in the average fund portfolio holdings is used in Section 4 to calculate the price pressure on other assets.

3. Cash Financed Mergers

The standard CRSP dataset records the delisting distributions of cash financed mergers. This record identifies the exact dates when outstanding stocks retire. These cash mergers are described by delisting code (233) and distribution codes (32XX) in the daily stock header file. From Q1 1999 through Q3 2011, there were 386 cash mergers where a common US stock delists for over $1 billion. Table 1 describes summary statistics for the largest 20 of these mergers by the value of stocks retired.

3.1 Purchasing Pattern around Cash Mergers

Figure 2 shows net trading activities by ANcerno investors around the three largest cash financed merger events through the sample period: the purchase of 1) Anheuser-Beusch (AB) by InBev on November 17, 2008, 2) Genentech by Roche in March 26, 2009, and 3) AT&T Wireless by Cingular on October 26, 2004. I separate institutional accounts into two groups according to their prior accumulation of the target stock. The left-hand panels show the net dollar volume from client accounts that accumulated the target stock prior to the cash payment date. The right-hand panels display dollar volume from client accounts that did not accumulate any shares.[9]

Each graph describes the aggregate trading by the respective groups of ANcerno accounts in the -5 to 10 trading days around a cash payment event. In all three cases, institutional investors purchased large dollar volumes of other stocks on or after the merger payment date. Institutional accounts in ANcerno bought a total of $7.6 billion in the 5 trading days after the Anheuser-Busch merger, and $8.2 billion over the entire measured horizon (over the -5 to 10 trading day period). These net dollar volumes are linked to prior ownership of AB stocks. Over 77% of the total cumulative volume come from accounts that were identified to receive payments from the merger (left panel); and only a minority came from other accounts (right panel). The second (Genetech) and the third (AT&T Wireless) largest cash financed acquisitions repeat the same event time pattern. In all three cases, the identified stockholders of the respective acquisition targets actively acquired stocks over the rest of the investor accounts.

[9] ANcerno reports trades by institutional accounts, but not their contemporaneous holdings. I measure the accumulation of a stock by examining the entire trading history of each client. Specifically, I sum up all the split-adjusted shares of a stock bought and sold by a client account from the first recorded trade until the most recent trade. If, for a single stock, an account sells more shares than it had bought before the time of that trade, then the accumulation is set to zero.

Figure 2 represents a simple summary of the ANcerno investor, but this visible pattern around cash merger payments may be driven by both selection and the payment. Panel A of Table 2 conducts a formal test of cash reinvestment using a difference-in-difference panel setup. This panel assesses whether cash payments from cash mergers affect the trading behavior of asset manager accounts. In order to ensure that the treated and the control investors have similar ex-ante trading patterns, I filter the data to include only accounts with gross dollar volume of at least $1 million in gross volume during the 30 to 10 trading days prior to the payment date. The left-hand side variable, $Abnormal\ Dollar\ Volume_{j,t,e}$, is the daily dollar volumes from investor *j* in the *t*-th [-10, 10) trading days around the merger event *e*, normalized by the investor's average gross daily trading volume in the 30 to 10 trading days prior (of course excluding activities on the target and the acquirer). $Post\ Event_{t,e}$ indicates a post-distribution day, and captures the pre-post difference. The ideal treatment for disentangling the payment-induced demand is an investor's exact holdings of the cash merger target; however, since those data are not available, the treatment variable, $Held\ Target_{j,e}$, is an indicator for whether investor *j* had bought shares of the target-stock in its history before the payment date. This is the treatment difference.

The regression coefficients in Table 2 show that an investor holding the target stock would increase its net dollar trading volume in the days after the cash-financed merger payment. After the payment of the ten largest cash mergers in my sample, a target-holding investor increased its *net* dollar volume by 6.04% ($t = 5.637$) of its average *gross* volume from the -30 to -11 days before a merger event. This quantitative effect declines as I include smaller cash mergers. There is a treatment effect of 4.39% ($t = 5.964$) for the panel of top 30 mergers; and 2.80% ($t = 5.996$) for the top 100 mergers. These results show that merger cash injections have an economically significant impact on individual investor demand for stocks. Importantly, this effect is absent for stock-financed mergers in columns 4 through 6. Stock-financed mergers do not affect investors' net trading behavior to any quantitatively large magnitude. Therefore, it is unlikely that changing investor expectation of a merger completion drives my results. If there is any cash management by the cash-distributed investors, such management still does not prevent reinvestment activities from occurring in the data. In summary, these results indicate that the timing of cash-returns drive investment demand.

3.2 Pricing Effect of Cash-Merger Induced Demand

Given that cash-receiving investors demand assets, the targets of these purchases presumably experience price pressure. In this section, I examine the pricing patterns of the associated stocks using both ex-post (*InducedBuy*) and ex-ante (*Cash Merger Pressure*) measures of potential demand driven price pressure.

For an ex post measure of demand, I construct *InducedBuy*, which indicates whether cash-redeploying investors increased their holdings of stock *i* in the [0, 30) trading days after a merger. Specifically, $InducedBuy_{i,e}$ is 1 if the total net purchase of stock *i* by the investors who held the target stock during event *e* is positive, and 0 otherwise.[10]

In Table 3, I compare this group of demand affected stocks to all other stocks in the CRSP universe (Panel A), and to stocks purchased by investors who did not hold the target (Panel B). I regress this indicator variable on event time cross sectional returns using Fama-MacBeth (1973)

[10] $InducedBuy$ splits the CRSP universe of stocks. 53% of stocks by value experienced induced buying during the top 100 cash merger payment events. Additionally, this indicator forms 65% of stocks by value out of all stocks bought by both cash-redeploying and non-cash-redeploying investors in the ANcerno,

regressions. The left-hand side variables are cumulative excess returns over the daily risk-free rate during the [0 to 30), [30 to 90), and [90 to 150) trading days after a payment event for the largest 100 merger events. While *InducedBuy* may select on the buying activity of the cash-redeploying investors, in principal, this selection effect will be diminished by Panel B's comparison to all the other stocks being purchased in net by non-target holding ANcerno investors during each event.[11]

Consistent with short temporary shocks to prices, *InducedBuy* is not only correlated with contemporaneous excess returns, but also forecasts reversals at longer horizons for both the CRSP universe and the universe of stocks purchased by ANcerno investors. A stock associated with this demand experiences an average of 0.847% (t = 5.45) in excess returns over other stocks in the first 30 trading days after the payment of a merger. In the next 60 days, it experiences a reversal of -0.518% (t = -2.76), and a further -0.679% (t = -2.39) in the 60 trading days after. Similarly, compared to the stocks purchased by other ANcerno investors, *InducedBuy* stocks experience 0.504% (t = 3.06) in excess returns in the first 30 trading days, and a reversal of -0.267% (t = -1.42) and -0.658% (t = -2.95) in the following 60 day periods. This pattern of abnormal returns and reversals remains qualitatively similar once I include controls for size, book value, and past returns. Figure 3 records the cumulative excess returns of a portfolio that longs stocks with induced buying and shorts the rest of the cross-section from -30 trading days prior to 150 days after the merger payment. Graphically, mirroring the regression results, Figure 3 demonstrates a pattern of excess contemporaneous (and some prior) abnormal returns, and a long subsequent reversal, consistent with non-fundamental price pressure. This pattern is qualitatively similar for other ranges of top cash mergers (See Appendix A1).

[11] I thank the referee for this helpful recommendation.

As additional evidence that price pressures due to cash-mergers in this section are not due to ex-post selection, I construct a measure of expected demand from cash-merger reinvestments using mutual fund portfolios. This measure mirrors Flow Induced Price Pressure (*FIPP*) of Lou (2012) and the Cash Induced Demand (*CID*) of the next section. For each cash merger event *e*, $Cash\ Merger\ Pressure_{i,e}$ is the aggregate weights to each stock *i* under the assumption of proportional reinvestment by mutual fund portfolios (since the *ex-ante* holdings of ANcerno portfolios are not available). In other words, $Cash\ Merger\ Pressure_{i,e}$ for each stock *i* is the sum of cash merger payments to each mutual portfolio apportioned by *i*'s respective portfolio weights, divided by the total value of *i* held by all observed portfolios in the last quarter-end (*t*) prior to the event *e*:

$$Cash\ Merger\ Pressure_{i,e} = \sum_j \frac{SharesHeld_{i,j,e}}{\sum_j SharesHeld_{i,j,e}} CashMergerWeight_{j,e} \qquad (1)$$

$CashMergerWeight_{j,e}$ is the weight of target of the cash-merger in each fund portfolio *j* in the quarter-end holding disclosure prior to a merger event.

Cash Merger Pressure can be interpreted as the percentage increase in the holding of stock *i* by the aggregate mutual fund portfolio due to cash returns from the merger. A 1% in *Cash Merger Pressure* for a stock indicates that, assuming proportional reinvestment, mutual fund portfolios will increase their holdings of that stock by 1% after a cash-merger event. The summary statistics for *CashMergerWeight* and *Cash Merger Pressure* are reported in Table 4 (A).

We also observe predictability that coincides with short-term abnormal returns and long-term reversals (although non-significant) utilizing fund portfolios as the representative portfolio. As can be observed in the Panel B of Table 4, during the first 30 trading days of a cash-merger event, one standard deviation of this variable is associated with 0.297% (t = 2.31) returns. These returns revert on average in the next two 60 trading periods- by -0.14% (t = -0.662) and -0.180% (t = -0.543) respectively.

3.3 Purchased Stock Characteristics

After establishing that merger driven cash-returns drive demand and price pressure for investible assets, I turn to the characteristics of the stocks that were purchased by these cash deploying asset managers. Table 5 regresses *InducedBuy* the indicator for whether a stock is in net purchased by a cash-redeploying portfolio during the [0, 30) trading days after the payment-against stock and ownership characteristics. I use a simple panel regression specification to analyze the redeployment pattern of institutional investors in ANcerno:

$$InducedBuy_{i,e} = \alpha + \beta \cdot InstOwn + \delta \cdot SP500Membership + \sum\gamma \cdot Controls_{i,e} + \epsilon_{i,e}. \qquad (2)$$

The left-hand side, $InducedBuy_{i,e}$, describes whether stockholders receiving the cash merger payments bought stock i in net over the [0,30) trading days around the payment event e. The right-hand side include standard characteristics such as log market equity, log book equity, and past 12 month returns. I also include additional ownership characteristics such as S&P 500 membership dummy and percent of stocks held by 13F institutions to gauge whether such purchases are associated with institutional and index holdings.

Table 5 shows that the recipient of these price pressures tend to have high prior institutional ownership, growth stocks characteristics (high market to book value), and a lack of S&P 500 membership. One standard deviation of institutional ownership increases the probability that a stock would be purchased by the target holding ANcerno managers by 1.906% (t = 7.16) during the Top 100 cash mergers.

Overall, these cash-merger event studies test whether the transfer of cash from firms drive investor demand for other assets. The recipients of this cash flow substantially increase their purchasing activities in the trading days after the closure of a cash measure against other investors. These cash mergers also introduce a price effect in the cross section of equities. In the short term after a cash merger deal, the stocks purchased by cash-redeploying investors appreciate in prices.

4. Cash Induced Demand

The evidence from cash mergers indicates a channel through which cash returns affect the pricing of other stocks. Unlike cash mergers, where the event horizons are clear-cut, the cash-return from a single firm at any given date is individually small. Over horizons such as a quarter or a year, such cash returns aggregate to a large and consistent source of investible cash for diversified portfolios- well exceeding other sources of investor demand. Figure 1 plots the aggregate cash return from common stocks traded on the NYSE, NASDAQ, and AMEX exchanges benchmarked against inflows to equity mutual funds. As can be observed in this figure, between 2010 and 2016, dividend and buyback payouts aggregated to several times the magnitude of retail investor flow into equity funds- indicating that cash returns are large aggregate drivers of demand for investible assets.

4.1 Abnormal Excess Returns Predictability

In this section, I use mutual funds as my representative investors to construct measures of induced demand from cash returns and compares this channel of return predictability to that from investor flows.[12] Since cash-payouts do not change the total net asset value of a managed portfolio, this demand measure should not in principle capture informed trading. A manager who purchases assets using dividend dollars with the belief that these assets are undervalued, could have simply reallocated his portfolio toward these assets in general, notwithstanding these dividend payment programs. Furthermore, I use the pro rata buyback yield- the percent decrease in shares outstanding of a stock apportioned to each investor portfolio by their holdings- in order to avoid the information contained in an investor's buyback participation.

Mirroring the construction of Flow Implied Price Pressure (*FIPP*) in Lou (2012), Cash Induced Demand (*CID*) from capital returns for stock *i* in quarter *t* is calculated as:

$$CID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t}, \tag{3}$$

where $SharesHeld_{i,j,t-1}$ is the number of shares in stock *i* held by mutual fund *j* at *t-1* and $Cap\_Flow_{j,t}$ is the expected cash flow, as a percent of net assets, from payout programs experienced by portfolio *j* from *t-1* to *t*:

$$Cap\_Flow_{j,t} = \underbrace{\sum_i Weight_{i,j,t-1} \cdot Dividends_{i,t}}_{Div\_Flow_{j,t}} + \underbrace{\sum_i Weight_{i,j,t-1} \cdot |Buyback_{i,t}|}_{Buy\_Flow_{j,t}}. \tag{4}$$

[12] This assumes proportional reinvestment into existing holdings, which simplifies the construction of this demand variable. Appendix A2 shows that most dollars paid to mutual funds tend to stay within the fund. Appendix A7 examines the effect of passive and active mutual funds separately.

Here, *Dividends* and |*Buyback*| are the respectively dividend and pro rata buyback yields.[13] With *Cap_Flow*, I implicitly assume that there is no overlap between the stocks were are sold to a buyback program and those granting dividend returns.[14]

CID is the aggregation of cash-returns apportioned by ex-ante portfolio weights, and can be interpreted as the percentage increase in the holdings of a stock by the aggregate mutual fund portfolio. A 1% *CID* indicates that, assuming proportional reinvestment, mutual fund portfolios will increase their holdings of the stock *i* by 1% using the cash flows from dividend and buyback payments. An alternative way to write *CID* is simply:

$$CID_{i,t} = \frac{\sum_j (Cap_{Flow\,j,t} \cdot TNA_{j,t-1} \cdot weight_{i,j,t-1})}{\sum_j (Price_{i,t-1} \cdot SharesHeld_{i,j,t-1})}. \quad (5)$$

That is, $CID_{i,t}$ for each stock *i* is the sum of all dollar cash payments to every mutual fund portfolio *j* apportioned by *i*'s respective portfolio weights, divided by the total value of *i* held by all observed portfolios.

Table 6 provides summary statistics on *CID* and *FIPP* (Lou, 2012) – the flow-induced price pressure that aggregates mutual fund flows by assuming proportional investment. The *CID* measure has the advantage of not being skewed toward extreme outliers. Noticeably, the cross-sectional spread between high and low *CID* stocks is much narrower than the spread in *FIPP*.

I conduct return predictability tests using this cash induced demand variable. In these tests, I restrict the sample of public common stocks traded on the NYSE, NASDAQ, and AMEX exchanges in two ways: 1) Exclusion of stocks with dividend payments or buybacks in the past

[13] See Appendix A9 for their constructions.
[14] See Appendices A3 for Fama-MacBeth and A4 for calendar portfolio results using demand measurements based on dividends and buybacks separately.

year. 2) Exclusion of stocks with market capitalizations lower than the bottom decile of NYSE firms and the bottom decile of stocks ranked on mutual fund ownership to minimize micro-capitalization and liquidity issues. The final firms in the sample have not explicitly produced cash return and are large enough to abstract from microstructure related concerns[15]. This filtration to non-cash paying firms also addresses concerns in which high payouts by the firms in question drives their own respective high measurements of induced-demand. There are 87,373 stock-quarter observations left to serve as a clean laboratory for testing the effect of cash-induced demand.

CID is associated with significant excess returns at the one-quarter and one-year horizons. Table 7 provides Fama-MacBeth regression analysis of returns on CID and various common characteristics. A one-standard deviation of CID forecasts 1.11% (t = 2.12) increased excess return in the following quarter and an average of 0.97% (t = 2.50) per quarter over the following year. The predictability is 1.04% (t = 2.39) and 0.87% (t = 2.83) respectively once contemporaneous flow-induced price pressure $FIPP$ and other controls are added.

CID and $FIPP$ capture the percentage increase in holdings due to demand as opposed to measures that are normalized by volume, such as the *MFFLOW* of Edmans, Goldstein, and Jiang (2012). This allows for direct comparison to the inelastic asset demand hypothesis of Gabaix and Koijen (2020). These regression coefficients on CID reflect a much more inelasticity demand curve than that of $FIPP$ and are consistent with the estimates of \$5 dollar impact to \$1 dollar inflow of Gabaix and Koijen (2020). One standard deviation of CID in a stock is 0.23% of the stock's shares

[15] In Appendix A5, I relax the first restriction on stocks – which filters out firms with significant cash return – to demonstrate that the identified pricing phenomenon is generalizable, albeit weaker, in the entire cross section of stock returns. The weaker effect may arise from the fact that the measured CID in the general cross-section naturally corresponds to the level of a stock's cash payout. By focusing on non-payout stocks, we eliminate the endogenous choice element of a firm's payout decisions on their stock's pricing.

held by mutual funds. The regression coefficient for this one standard deviation (0.23%) of CID in column 1 of Table 7 is 1.04% - indicating that for 1% (and naturally $1) increase in the holdings of a stock from investor cash reinvestments, there is a 4.52% ($4.52) increase in the price of the asset. Relatively, the estimated price impact of $FIPP$ measures is 3.04% for a standard deviation of 9.84% in investor flows, which is characteristic of a much more elastic demand curve. This may be because investor flows tend to be volatile and potentially mean-reverting (as mentioned in Gabaix and Koijen (2020); whereas cash-payouts from public firms are demonstrably persistent.

The Fama-MacBeth regressions reflect a particular calendar time strategy. I sort this cross section of stocks into calendar time portfolios using CID. Overlapping quintile portfolios are held for multiple quarters following Jegadeesh and Titman (1993). As shown in Table 8 Panel A, the top quintile portfolio rebalanced quarterly and held for a single quarter experiences a monthly four-factor adjusted excess return of 0.57% (t = 3.91), while the lowest quintile portfolio experiences excess return of -0.54% (t = -2.86). A strategy shorting the lowest quintile portfolio and holding the highest quintile experiences a monthly return of 1.11% (t = 4.71). A strategy that longs the top portfolio and shorts the middle (third quintile) portfolio experiences a return of 0.82% (t = 4.28). CID continues to forecast excess returns in overlapping portfolios for multiple horizons. At the one-year horizon, the top quintile portfolio has a risk-adjusted alpha of 0.40% (t = 2.93) each quarter, while the bottom quintile portfolio obtains -0.40% (t = -2.32). The long-short strategy at this horizon generates an excess return alpha of 0.80% (t = 3.71) per quarter. Calendar time portfolio sorted to high and low institutional shares in Appendix A11 indicates that these returns are stronger for stocks that had low prior institutional ownership. While institutional ownership may capture multiple factors characterizing stocks, one potential explanation for this result is that stocks with low arbitrage capital (low prior institutional ownership) tend to experience higher magnitudes of price fluctuations.

The abnormal return associated with CID persists; I do not find evidence of reversals in the calendar time sorted portfolios. This lack of short-term reversal contrasts the expected price pressures from mutual fund flows literature, but is similar to the returns of stocks that were recently included in an index.[16] As argued in Gabaix and Koijen (2020), demand sources of fluctuations do not necessarily require reversals, so long as that demand is not mean-reverting. Similar to membership in stock index, exposure to cash induced demand through fund portfolios tends to be persistent. Cash payout programs by individual firms last years if not decades. Whereas stocks with high degrees of mutual fund flow pressure would experience fire purchases for a single quarter, stocks sorted to the highest quintile of CID would likely experience continual levels of demand from cash redeploying investors. The payout reinvestment mechanism is an alternate, but potentially more substantial, source of demand to that in the existing literature.

4.2 Future Issuance, Repurchasing, and Dividend Payment Characteristics

This section explores the characteristics of the non-payout firms that experience high levels of cash induced demand. Beyond the basic size and value characteristics, I investigate these stocks' future payout and issuance policies in order to understand how firms respond to the pricing and demand related to cash payouts. Consistent with opportunistic behavior and a relaxation of financing constraints, I find that the non-payout firms most exposed to CID are more likely to issue

[16] Price effects from investor-flows begins to revert after its measurement date (Frazzini and Lamont (2008)), while those of index inclusions tend to be more persistent (Shleifer, (1986)).

more equity relative to other non-payout companies. Furthermore, I find that these firms do not substantially increase their cash returns to shareholders significantly at measurable horizons.

First, to start this analysis, Panel A of Table 9 describes basic sizing characteristics of firms in the calendar time portfolios from the previous section. The columns record the average market equity and the book equity of these cross-sections in 1990, 2003, and 2016 respectively. In this cross-section of non-cash returning firms, high exposure to cash induced demand tend to be associated with larger size and higher book-to-market value stocks.

Panel B of Table 9 focuses on the future payout and issuance policies of these non-payout stocks purchased by investors. It describes the forward cash return and issuance policies of firms in each portfolio at 3 year, 6 year, and 12 year intervals. Since the targets of these stock purchases are high growth-characteristic firms without any recent cash-payouts, they generally have high levels of gross-issuances. We observe that the cross-sectional increases in future payout policy between these portfolios are economically small. Despite experiencing cumulative returns difference of more than 12% in a 12 month holding period window, the highest and lowest quintile CID portfolios had on average spread of 0.08% in the change of their repurchasing activities and a spread of 0.04% in the change in dividend yields over 3 years. Over the 12-year horizon, the increase in buybacks essentially disappears. These measures suggest that the abnormal returns for high versus low CID portfolios do not lie in changing beliefs on cash payouts.

Instead, consistent with opportunistic behavior, I find that firms that are strongly associated with cash redeployment tend to have greater levels of gross issuances over time. A stock in the top-quintile portfolio sorted on CID is 0.69% higher in their change in quarterly stock issuance than the bottom quintile portfolio over the 3-year horizon (0.83% at the 6 year and 1.18% at the

12 year horizons). The issuance levels for both the long and the short portfolios are plotted in Figure 4. Due to their initial characteristics, both the long and the short legs start with positive gross-issuances (normalized at 1 in the beginning period), which declines over time. However, the decline in the short leg is much more dramatic than the long leg. Stocks most associated with CID have significantly more persistent level of issuance compared to the stocks located in the bottom quintile.

Table 10 presents regression analysis to help us understand the average correlation between CID and changes in buyback, issuance, and dividend activities. Once I control for characteristics such as size, past issuance, and past returns, I find that a firm's payout activities only increase marginally with their exposure to cash returns. One standard deviation increase in the CID measure is associated with an increase of 1 basis point in average buyback activity for a stock over the next 6 years; and 3 basis points in dividend payment activity. In contrast, the CID measure is correlated with future issuances at significant levels. One-standard deviation increase in CID implies an increase of 65 basis points of shares outstanding per quarter over 24 quarters. In terms of economic magnitudes, exposure through CID is associated with economically meaningful increases in future issuance, but only minor increases in cash returns.

The evidence here shows that non-payout firms experiencing this spillover channel of induced price pressure only marginally increase their future payout activities. Rather, the same firms experiencing demand from cash payout programs persistently issue equity relative to other stocks that do not have cash return programs. The empirical facts documented here are consistent with opportunistic equity issuance.

5. Conclusion

This paper provides a substantial source of inflow driven demand fluctuations in the financial markets. Cash-returns by public firms through cash mergers, dividend payments, and buyback programs form demands that exceed the aggregate cash-flows from investors into mutual funds. These cash driven asset demands alleviate some of the weaknesses in the identification of investor driven demand that are often used in the finance literature.

The documented price pressures do not revert for dividend or buyback programs, and are associated with significant magnitudes of stock issuances over longer-horizons. The magnitude and the persistence of this asset demand through cash-returns potentially drive large variations in returns and also in the activities of *other* stocks. The price predictability documented in this paper complements the empirical foundations of the demand driven asset fluctuation hypothesis.

References

Anton, Miguel, and Christopher Polk. 2014. "Connected Stocks." *Journal of Finance* 69 (3): 1099-1127.

Baker, Malcolm, and Jeffrey Wurgler. 2000. "The Equity Share in New Issues and Aggregate Stock." *Journal of Finance* 55 (5): 2219–2257.

Barberis, Nicholas, and Andrei Shleifer. 2003. "Style Investing." *Journal of Financial Economics* 161-199.

Bhattacharya, Sudipto. 1979. "Imperfect Information, Dividend Policy, and "The Bird in the Hand" Fallacy." *Bell Journal of Economics* 10 (1): 259-270.

Black, Fischer. 1976. "The Dividend Puzzle." *Journal of Portfolio Management* 2 (2): 5-8.

Boyer, Brian H. 2011. "Style-Related Comovement: Fundamentals or Labels?" *Journal of Finance* 66 (1): 307–332.

Braun, Matías, and Borja Larrain. 2009. "Do IPOs Affect the Prices of Other Stocks? Evidence from Emerging Markets." *Review of Financial Studies* 22 (4): 1505-1544.

Brav, Alon, John R. Graham, Campbell Harvey, and Roni Michaely. 2005. "Payout Policy in the 21st Century." *Journal of Financial Economics* 77 (3): 483-527.

Brown, Stephen J., and William N. Goetzmann. 1997. "Mutual Fund Styles." *Journal of Financial Economics* 43 (3): 373-399.

Choi, Jaewon, Saeid Hoseinzade, Seunghun Sean Shin, and Hassan Tehranian. 2020. "Corporate bond mutual funds and asset fire sales." *Journal of Financial Economics* 138 (2): 432-457.

Cook, Douglas O., Laurie Krigman, and Chris J. Leach. 2004. "On the Timing and Execution of Open Market Repurchases." *Review of Financial Studies* 17 (2): 463-498.

Coval, Joshua, and Erik Stafford. 2007. "Asset Fire Sales (and Purchases) in Equity Markets." *Journal of Financial Economics* 86 (2): 479-512.

Cremers, Martin, and Antti Petajisto. 2009. "How Active Is Your Fund Manager? A New Measure That Predicts Performance." *Review of Financial Studies* 22 (9): 3329-3365.

Di Maggio, Marco, Amir Kermani, and Kaveh Majlesi. 2018. "Stock Market Returns and Consumption." *Working Paper.*

Dittmar, Amy, and Laura Casares Field. 2015. "Can Managers Time the Market? Evidence Using Repurchase Price Data." *Journal of Financial Economics* 115 (2): 261-282.

Edmans, Alex, Itay Goldstein, and Wei Jiang. 2012. "The Real Effects of Financial Markets: Impact of Prices on Takeovers." *Journal of Finance* 67 (3): 933-971.

Fama, Eugene F., and James D. MacBeth. 1973. "Risk, Return, and Equilibrium: Empirical tests." *Journal of Political Economy* 81 (3): 607–636.

Frazzini, Andrea, and Owen A. Lamont. 2008. "Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns." *Journal of Financial Economics* 88 (2): 299–322.

Gabaix, Xavier, and Ralph Koijen. 2020. "In Search of the Origins of Financial Fluctuations: The Inelastic Markets Hypothesis." *NBER Working Paper No. w28967.*

Graham, John, and Campbell Harvey. 2002. "How Do CFOs Make Capital Budgeting and Capital Structure Decisions?" *Journal of Applied Corporate Finance* 15 (1): 8-23.

Greenwood, Robin. 2005. "Short- and Long-term Demand Curves for Stocks: Theory and Evidence on the Dynamics of Arbitrage." *Journal of Financial Economics* 75 (3): 607–649.

Greenwood, Robin, and Samuel G. Hanson. 2012. "Share Issuance and Factor Timing." *Journal of Finance* 67 (2): 761-798.

Grullon, Gustavo, and Roni Michaely. 2002. "Dividends, Share Repurchases, and the Substitution Hypothesis." *Journal of Finance* 57 (4): 1649-1684.

Harris, Lawrence, and Eitan Gurel. 1986. "Price and Volume Effects Associated with Changes in the S&P 500 List: New Evidence for the Existence of Price Pressures." *Journal of Finance* 41 (4): 815-829.

Hartzmark, Samuel M., and David H. Solomon. 2017. "The Dividend Disconnect." (Working Paper).

Hong, Harrison, Jiang Wang, and Jialin Yu. 2008. "Firms as Buyers of Last Resort." *Journal of Financial Economics* 88 (1): 119-145.

Hu, Gang, Koren M. Jo, Yi Alex Wang, and Jing Xie. 2018. "Institutional Trading and Abel Noser Data." *Journal of Corporate Finance* 52: 143-167.

Ikenberry, David, Josef Lakonishok, and Theo Vermaelen. 1995. "Market Underreaction to Open Market Share Repurchases." *Journal of Financial Economics* 39 (2-3): 181-208.

Jagannathan, Murali, Clifford P. Stephens, and Michael Weisbach. 2000. "Financial Flexibility and the Choice Between Dividends and Stock Repurchases." *Journal of Financial Economics* 57 (3): 355-384.

Jegadeesh, Narasimhan, and Sheridan Titman. 1993. "Returns to Buying Winners and Selling Losers: Implications for Stock Market." *Journal of Finance* 48 (1): 65–91.

Kahle, Kathleen M. 2002. "When a Buyback Isn't a Buyback: Open Market Repurchases and Employee Options." *Journal of Financial Economics* 63 (2): 235-261.

Kahn, Mozaffar, Leonid Kogan, and George Serafeim. 2012. "Mutual Fund Trading Pressure: Firm-Level Stock Price Impact and Timing of SEOs." *Journal of Finance* 67 (4): 1371-1395.

Kaul, Aditya, Vikas Mehrotra, and Randall Morck. 2002. "Demand Curves for Stocks Do Slope Down: New Evidence from an Index Weights Adjustment." *Journal of Finance* 55 (2): 893-912.

Lamont, Owen, Christopher Polk, and Jesús Saaá-Requejo. 2001. "Financial Constraints and Stock Returns." *Review of Financial Studies* 14 (2): 529-554.

Lou, Dong. 2012. "A Flow-Based Explanation for Return Predictability." *Review of Financial Studies* 25 (12): 3457–3489.

Loughran, Tim, and Jay R. Ritter. 1995. "The New Issues Puzzle." *Journal of Finance* 50 (1): 23–51.

Massa, Massimo, Zahid Rehman, and Theo Vermaelen. 2007. "Mimicking Repurchases." *Journal of Financial Economics* 84 (3): 624–666.

Miller, Merton H, and Franco Modigliani. 1961. "Dividend Policy, Growth, and the Valuation of Shares." *Journal of Business* 34 (4): 411-433.

Mitchell, Mark, Todd Pulvino, and Erik Stafford. 2004. "Price Pressure around Mergers." *Journal of Finance* 59 (1): 31-63.

Pastor, Lubo, Robert F. Stambaugh, and Lucian A. Taylor. 2017. "Do Funds Make More When They Trade More?" *Journal of Finace* 72 (4): 1483-1528.

Petajisto, Antti. 2013. "Active Share and Mutual Fund Performance." *Financial Analysts Journal* 69 (4): 73-93.

Puckett, Andy, and Xueman Yan. 2011. "The Interim Trading Skills of Institutional Investors." *Journal of Finance* 66 (2): 601-633.

Ross, Stephen A. 1977. "The Determination of Financial Structure: The Incentive-Signalling Approach." *Bell Journal of Economics* 8 (1): 23-40.

Shleifer, Andrei. 1986. "Do Demand Curves for Stocks Slope Down?" *Journal of Finance* 41 (3): 579-590.

Shleifer, Andrei, and Robert W. Vishny. 1992. "Liquidation Values and Debt Capacity: A Market Equilibrium Approach." *Journal of Finance* 47 (4): 1343-1366.

Shleifer, Andrei, and Robert W. Vishny. 1997. "The Limits of Arbitrage." *Journal of Finance* 52 (1): 35-55.

Stephens, Clifford P., and Michael S. Weisbach. 2002. "Actual Share Reacquisitions in Open-Market Repurchase Programs." *Journal of Finance* 53 (1): 313-33.

Sunderam, Adi, and Sergey Chernenko. 2019. "Do Fire Sales Create Externalities?" *Journal of Financial Economics* 135 (3): 602-628.

Vermaelen, Theo. 1981. "Common Stock Repurchases and Market Signalling: An Empirical Study." *Journal of Financial Economics* 9 (2): 139-183.

Warther, Vincent A. 1995. "Aggregate mutual fund flows and security returns." *Journal of Financial Economics* 39 (2): 209-235.

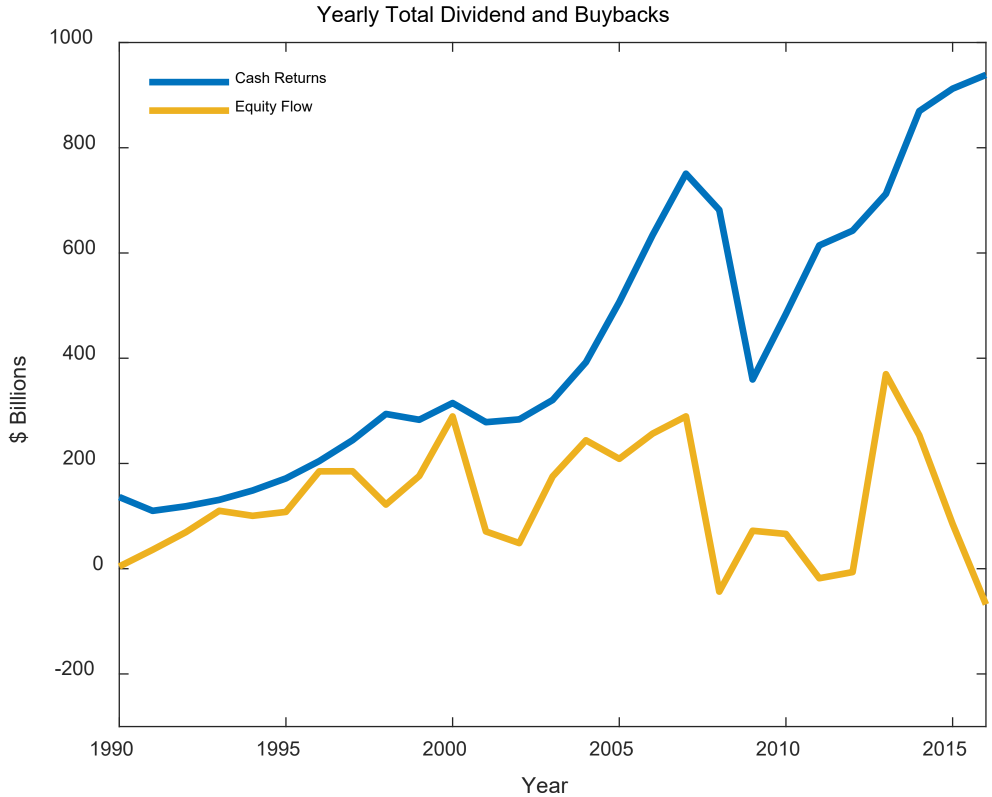


Figure 1. Annual Total Dividend and Buyback Cash Flows

This figure plots the quarterly aggregate capital return (buyback and dividend payments) in the CRSP universe of common stocks traded on the NYSE, NASDAQ, and AMEX exchanges; and net fund flow into the CRSP universe of equity funds. Buyback is the product of adjusted decline in shares and quarter start prices. Dividend payment is dividend yield (the difference between total and price returns) multiplied by market capitalization at the start of the quarter. Equity flow is calculated from CRSP as the difference between the quarter end TNA and the quarter start TNA adjusted by fund returns.

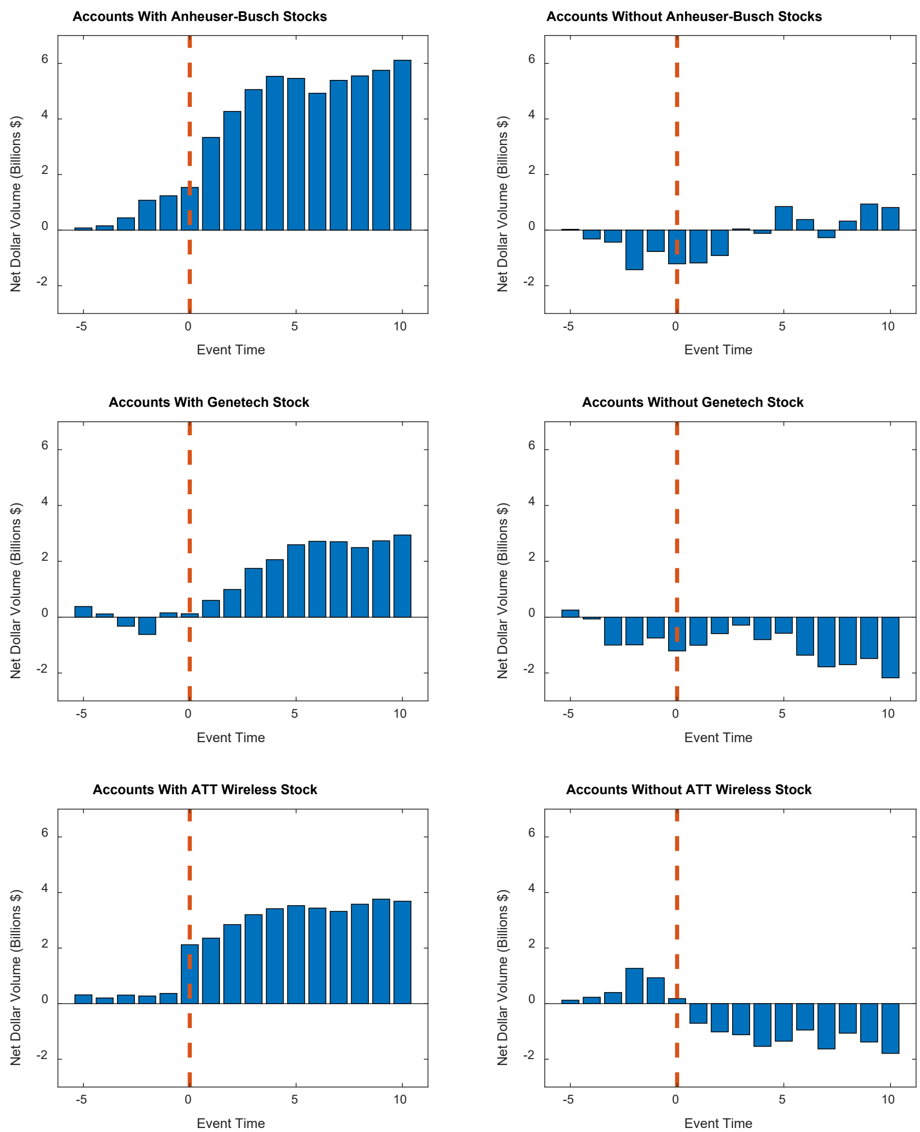


Figure 2. Three Largest Cash Mergers between Q1 1999 through Q3 2011

This figure plots cumulative net dollar trading volume of all stocks (not including the target and the acquirer during a cash merger) by ANcerno accounts from 5 trading days before to 10 days after the payment date (dashed red line) for the three largest cash mergers completed between Q1 1999 through Q3 2011. I designate an account (*clientmgrcode*) in ANcerno as holding a stock if it had, in net, purchased this stock between the account's first observation date and the payment date of the merger. The left-hand panels depict net dollar volume by accounts holding this target stocks. The right panels depict total net trading by the rest of the investor accounts.

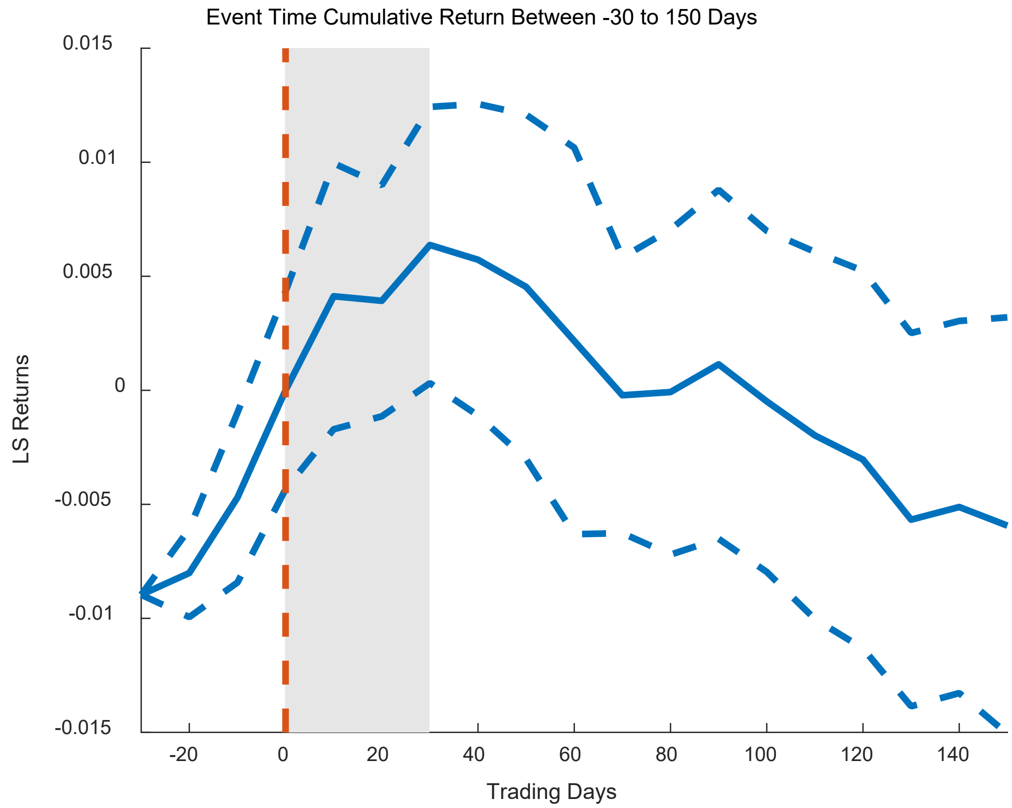


Figure 3. Event time cumulative abnormal returns during the top 100 cash mergers.

This figure plots the long-short event time cumulative abnormal returns (CAR) of equal weighted longing (shorting) stocks with (without) *InducedBuy*. The blue solid line is the average cumulative abnormal returns for the top 100 cash mergers, blue dashed lines are the 95% confidence interval, and the red dashed lines indicate the cash-payment date. The grey shaded region indicates [0,30) trading days around the merger completion.

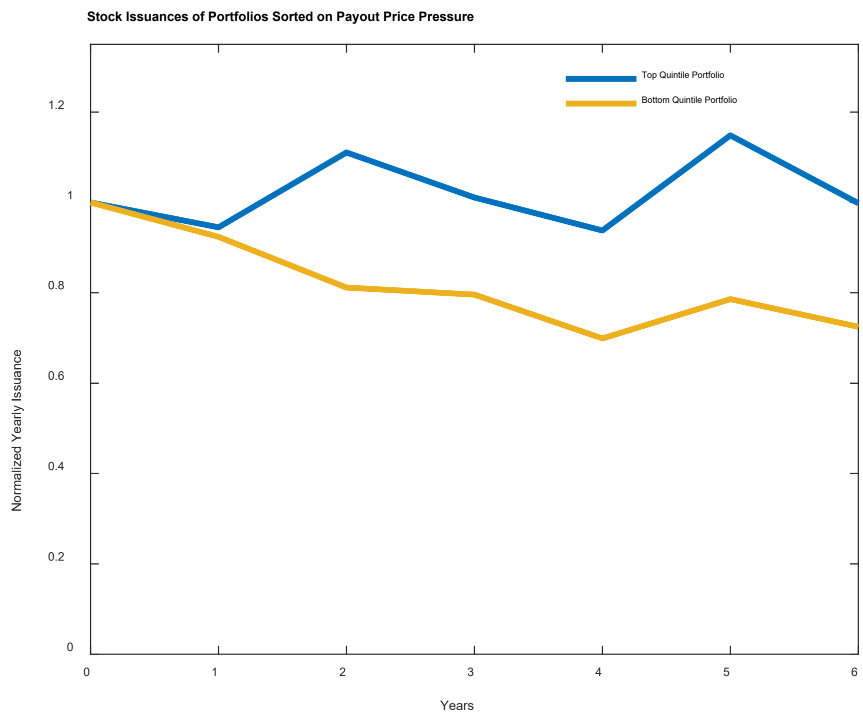


Figure 4. Equity Issuance by Calendar Time Portfolios.

This figure plots dollar equity issuance patterns of the average stocks in calendar time portfolios normalized at the total issuance in the first year. The blue and yellow lines are the yearly equity issuance of an average stock in the top and bottom-quintile portfolios over the next six-year horizon.

Table 1. Top Cash Mergers and Their Characteristics

The largest 20 cash mergers, in terms of the value of stocks retired, over Q1 1999 through Q3 2011 are tabulated in this table. These mergers correspond to the delisting code (233) and distribution codes (32XX) in the CRSP header files. The total value of stocks delisted is usually different from the merger deal size due to prior minority shares held by the acquirer in the cash target. # ANcerno Accts is the number of client accounts observable in ANcerno that had (and had not) accumulated shares of the cash merger target before the merger payment date.

Cash Merger Target	Total Value of Stocks Delisted	Payment Date	# of ANcerno Accts With Target	# of ANcerno Accts Without Target
Genentech	$ 100,115,275,000	3/26/2009	552	13,196
Anheuser Busch	$ 50,614,830,000	11/17/2008	342	14,038
AT&T Wireless	$ 40,943,370,000	10/26/2004	286	6,244
TXU	$ 31,934,776,000	10/10/2007	406	15,477
First Data	$ 25,637,054,000	9/24/2007	366	15,283
Alltel	$ 24,630,678,000	11/16/2007	209	15,994
Cox Communications	$ 21,069,585,000	12/8/2004	457	6,514
HCA Inc.	$ 20,899,800,000	11/17/2006	521	11,999
Bestfoods	$ 20,255,602,000	10/4/2000	108	3,214
Hilton Hotels	$ 18,543,810,000	10/24/2007	242	15,877
Clear Channel	$ 17,923,824,000	7/30/2008	202	14,563
Wrigley William Jr	$ 17,493,120,000	10/6/2008	206	15,991
Harrahs Entertainment	$ 16,882,020,000	1/25/2008	182	19,340
Kerr Mcgee	$ 16,031,982,000	8/10/2006	199	11,131
Rohm & Haas	$ 15,420,314,000	4/1/2009	162	13,528
Kinder Morgan	$ 14,434,133,000	5/30/2007	126	17,375
Medimmune	$ 13,796,576,000	6/18/2007	453	17,737
Electronic Data Sys	$ 12,631,350,000	8/25/2008	194	13,966
Georgia Pacific	$ 12,496,224,000	12/22/2005	188	8,400
Lyondell Chemical	$ 12,174,048,000	12/20/2007	143	19,059

Table 2. Trading Activity Around Mergers by ANcerno Portfolios

Regression of net trading by investors following the delisting event. *Abnormal Dollar Volume*$_{j,t,e}$, for investor *j* at *t* trading day into merger event *e*, is the abnormal net dollar volume (on all stocks except for the target and acquirer) originating from *j* in the at the [-10, 10) *t*-th trading day. The abnormal dollar volume is calculated by dividing by the total net dollar volume at that day by the total cumulative gross dollar volume from the [-30, -10) days around the payment event. Investor portfolios must have had at least 1 million dollars of gross volume in the [-30, -10) days to be in the sample. *Held Target*$_{j,e}$ indicates whether the investor *j* held the target of the merger prior to the distribution event. *Post Event*$_{t,e}$ indicates the trading event time in the [0, 10) days of the distribution. Regressions are conducted separately for the top 10, 30, and 100 cash (columns 1 through 3) and stock-financed (columns 4 through 6) mergers. The t-statistics are clustered by each merger event.

	Abnormal Dollar Volume$_{j,t,e}$					
	Cash Mergers			Stock Mergers		
	Top 10	Top 30	Top 100	Top 10	Top 30	Top 100
Held Target$_{j,e}$	0.0492***	0.0525***	0.0597***	0.0335***	0.0288***	0.0350***
	(5.195)	(6.244)	(6.850)	(4.898)	(4.452)	(4.888)
Post Event$_{t,e}$	-0.00467*	0.00347*	0.000858	0.000250	-0.00173	-0.00284**
	(-1.658)	(1.873)	(0.835)	(0.0730)	(-0.869)	(-2.471)
Interaction$_{j,t,e}$	0.0604***	0.0439***	0.0280***	-0.00893	0.00367	0.00693*
	(5.637)	(5.964)	(5.996)	(-1.194)	(0.704)	(1.932)
N	488,120	1,419,200	4,654,380	417,000	1,210,780	4,060,000
Adj R^2	0.001	0.000	0.000	0.000	0.000	0.000

Table 3. Abnormal Returns Associated With Investor Purchases

Panel A. Fama MacBeth regressions of cumulative excess returns over the daily risk-free rate around the top 100 cash mergers for stocks in the whole CRSP universe. $InducedBuy_{i,e}$ is an indicator for whether ANcerno stockholders of the merger target increased their net holding of stock *i* in the [0, 30) trading days around the merger payment date. Columns 1 and 2 regresses contemporaneous excess returns on $InducedBuy_{i,e}$ and controls. Columns 3 and 4 regresses excess returns in the following 60 trading days. Columns 5 and 6 regresses excess returns during the 90 to 150 days after the merger payment. Columns 7 and 8 document the entire reversal between the 30 and 150 trading days. OLS t-statistics are reported in parenthesis.

	Event Time Fama-MacBeth Regressions							
	Excess Return [0, 30)		Excess Return [30, 90)		Excess Return [90, 150)		Excess Return [30, 150)	
$InducedBuy_{i,e}$	0.847%	0.917%	-0.518%	-0.242%	-0.679%	-0.332%	-1.303 %	-0.666%
	(5.45)	(6.18)	(-2.76)	(-1.29)	(-2.39)	(-2.17)	(-3.54)	(-2.52)
$Log\_BE_{i,e}$		0.193%		0.008%		-1.195%		-0.867%
		(0.93)		(-0.02)		(-3.27)		(-1.72)
$Log\_ME_{i,e}$		-0.233%		-0.059%		0.616%		0.259%
		(-1.03)		(-0.16)		(1.82)		(0.45)
$Ret12_{i,e}$		-0.762%		-0.625%		-1.03%		-1.58%
		(-0.99)		(-0.79)		(-2.25)		(-1.05)
$Avg\ N$	2,474	2,427	2,474	2,427	2,474	2,427	2,474	2,427
$Avg\ R^2$	0.18%	3.52%	0.08%	3.31%	0.06%	2.93%	0.06%	3.33%

Panel B. Fama MacBeth regressions of cumulative excess returns over the daily risk-free rate around the top 100 cash mergers for stocks that are purchased in net by ANcerno investors. $InducedBuy_{i,e}$ is an indicator for whether ANcerno stockholders of the merger target increased their net holding of stock i in the [0, 30) trading days around the merger payment date. Columns 1 and 2 regresses contemporaneous excess returns on $InducedBuy_{i,e}$ and controls. Columns 3 and 4 regresses excess returns in the following 60 trading days. Columns 5 and 6 regresses excess returns during the 90 to 150 days after the merger payment. Columns 7 and 8 document the entire reversal between the 30 and 150 trading days. OLS t-statistics are reported in parenthesis.

	Event Time Fama-MacBeth Regressions							
	Excess Return [0, 30)		Excess Return [30, 90)		Excess Return [90, 150)		Excess Return [30, 150)	
$InducedBuy_{i,e}$	0.512%	0.561%	-0.312%	-0.172%	-0.698%	-0.493%	-0.943%	-0.591%
	(3.26)	(3.96)	(-1.69)	(-0.94)	(-3.03)	(-3.06)	(-3.70)	(-2.28)
$Log\_BE_{i,e}$		0.014%		0.128%		-1.256%		-0.785%
		(0.64)		(0.34)		(-3.07)		(-1.43)
$Log\_ME_{i,e}$		-0.117%		-0.191%		0.598%		0.157%
		(-0.49)		(-0.48)		(1.52)		(0.27)
$Ret12_{i,e}$		-0.944%		-0.879%		-0.841%		-1.78%
		(-1.12)		(-1.05)		(-0.85)		(-1.16)
$Avg\ N$	1,969	1,931	1,969	1,931	1,969	1,931	1,969	1,931
$Avg\ R^2$	0.15%	3.87%	0.04%	3.54%	0.05%	3.26 %	0.04%	3.67%

Table 4. Abnormal Returns Associated With Investor Purchases

Panel A. Summary Statistics of mutual fund holdings of cash-merger targets and the reinvestment price pressure. *Cash Merger* $Weight_{j,e}$ is a mutual fund (*j*)'s holding weight of the cash financed merger target if it had held the target prior to a merger event *e*. *Cash Merger* $Pressure_{i,e}$ is the predicted price pressure for stock *i* from all visible mutual fund holdings calculated by assuming proportional reinvestment of cash merger distribution dollars.

	Mean	Std	Q1	Median	Q3	N
Cash Merger $Weight_{j,e}$ *(Top 10)*	1.040%	1.549%	0.185%	0.432%	1.190%	1,799
Cash Merger $Weight_{j,e}$ *(Top 30)*	0.763%	1.256%	0.128%	0.272%	0.857%	4,023
Cash Merger $Weight_{j,e}$ *(Top 100)*	0.595%	1.030%	0.066%	0.196%	0.651%	9,839
Cash Merger $Pressure_{i,e}$ *(Top 10)*	0.0494%	0.148%	0.0024%	0.012%	0.107%	21,474
Cash Merger $Pressure_{i,e}$ *(Top 30)*	0.0311%	0.102%	0.00067%	0.005%	0.023%	62,855
Cash Merger $Pressure_{i,e}$ *(Top 100)*	0.0245%	0.078%	0.00074%	0.004%	0.019%	209,510

Panel B. Fama MacBeth regressions of cumulative excess returns over the daily risk-free rate around the top 100 cash mergers for a measure of predicted price pressure. *Cash Merger* $Pressure_{i,e}$ is the aggregate investment into each stock i under the assumption of proportional reinvestment by mutual fund portfolios. Columns 1 and 2 regresses contemporaneous excess returns on *Cash Merger* $Pressure_{i,e}$ and controls. Columns 3 and 4 regresses excess returns in the following 60 trading days. Columns 5 and 6 regresses excess returns during the 90 to 150 days after the merger payment. Columns 7 and 8 document the entire reversal between the 30 and 150 trading days. OLS t-statistics are reported in parenthesis.

	Event Time Fama-MacBeth Regressions							
	Excess Return [0, 30)		Excess Return [30, 90)		Excess Return [90, 150)		Excess Return [30, 150)	
Cash Merger	0.297%	0.249%	-0.140%	-0.230%	-0.180%	0.068%	-0.242%	-0.09%
$Pressure_{i,e}$	(2.32)	(2.18)	(-0.66)	(-1.24)	(-0.54)	(0.280)	(-0.54)	(-0.28)
$Log\_BE_{i,e}$		0.055%		-0.127%		-1.164%		-1.170%
		(0.28)		(-0.35)		(-3.37)		(-2.18)
$Log\_ME_{i,e}$		-0.134%		-0.091%		0.546%		0.507%
		(-0.60)		(-0.23)		(1.49)		(0.87)
$Ret12_{i,e}$		-0.85%		-0.639%		-1.03%		-1.630%
		(-1.00)		(-0.74)		(-1.07)		(-1.04)
$Avg\ N$	2,101	2,065	2,101	2,065	2,101	2,065	2,101	2,065
$Avg\ R^2$	0.21%	3.62%	0.10%	3.60%	0.22%	3.18%	0.017%	3.87%

Table 5. Characteristics of Stocks that Experience Cash Merger Induced Demand

Panel regression of stocks bought by target stockholders around the 100 largest cash mergers on stock characteristics. The left-hand side variable, $InducedBuy_{i,e}$, indicates whether ANcerno institutional investors holding the target of the merger bought stock i in the 30 trading days on and after the payment date of the merger event, e. $Log\_BE_{i,e}$ is log book equity. $Log\_ME_{i,e}$ is log market capitalization. $Ret12_{i,e}$ is past 12 month returns of asset i. $Inst\_Own_{i,e}$ is the percent of the stock held by institutional managers normalized by its standard deviation during each merger event. $SP500\_Membership_{i,e}$ indicates whether the stock was a member of the S&P500 at the time of merger payment. The t-statistics are clustered by each merger event.

	$InducedBuy_{i,e}$			
	Top 10 Mergers	Top 30 Mergers	Top 100 Mergers	Top 300 Mergers
$Inst\_Own_{i,e}$	2.499%	2.314%	1.906%	1.918%
	(3.50)	(5.76)	(7.16)	(11.81)
$SP500\_Membership_{i,e}$	-6.966%	-7.798%	-8.468%	-9.994%
	(-4.02)	(-5.08)	(-7.65)	(-12.12)
$Log\_BE_{i,e}$	-1.136%	-0.416%	-1.215%	-1.520%
	(-1.95)	(-1.39)	(-5.02)	(-10.78)
$Log\_ME_{i,e}$	5.105%	4.273%	4.950%	6.071%
	(4.07)	(4.17)	(6.80)	(13.47)
$Ret12_{i,e}$	1.114%	0.317%	0.446%	3.55%
	(0.86)	(0.63)	(1.42)	(2.47)
Event Fixed Effect	Yes	Yes	Yes	Yes
N	24,435	72,340	242,693	742,834
$Adj\ R^2$	3.76%	6.94%	7.62%	8.05%

Table 6. Flow and Cash Return Aggregated

Summary statistic on quarterly cash induced demand, $CID_{i,t}$. $FIPP_{i,t}$, investor flow induced price pressure, serves as a benchmark. Only stocks that have not had a cash return program are included.

Assuming proportional reinvestment to initial fund values, flows and capital return are aggregated to the stock level in this table. Specifically, investor flow induced price pressure to stock *i* is calculated as

$$FIPP_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Inv\_Flow_{j,t}.$$

The flow-induced price pressure is simply the weighted average percentage flow into each mutual fund scaled by the proportional share held of a stock by each fund. Treating capital return as inflow and assuming proportional reinvestment, cash induced demand can be effectively calculated as:

$$CID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t},$$

where $Cap\_Flow_{j,t}$ is the amount of cash flow from capital returns experienced by portfolio *j* from *t-1* to *t*:

$$Cap\_Flow_{j,t} = \sum_{\iota} Weight_{\iota,j,t-1} \cdot \left(|Buyback_{\iota,t}| + Dividend_{\iota,t}\right).$$

CID and *FIPP* can be interpreted as a percentage increase in the aggregate mutual holdings of stock *i* as driven by cash-return and investor flows respectively.

	Mean	Std	Q1	Median	Q3	$\rho_{t,t-1}$	$\rho_{t,t-4}$	N
$FIPP_{i,t}$ (1990 to 2016)	2.53%	9.84%	-1.50%	0.82%	4.09%	0.260	0.088	87,373
$FIPP_{i,t}$ (1990 to 2002)	4.06%	12.13%	-1.05%	1.97%	6.16%	0.227	0.047	51,922
$FIPP_{i,t}$ (2003 to 2016)	0.28%	3.82%	-1.86%	-0.23%	1.81%	0.228	0.098	35,451
$CID_{i,t}$ (1990 to 2016)	0.46%	0.23%	0.29%	0.44%	0.60%	0.695	0.529	87,373
$CID_{i,t}$ (1990 to 2002)	0.37%	0.20%	0.22%	0.34%	0.48%	0.570	0.384	51,922
$CID_{i,t}$ (2003 to 2016)	0.59%	0.20%	0.45%	0.57%	0.71%	0.661	0.484	35,451

Table 7. Cash Induced Demand, Fama-MacBeth

This table records Fama MacBeth regression coefficients of average quarter excess returns on $CID_{i,t-1}$ and various controls.

Assuming proportional reinvestment to initial fund values, capital returns are aggregated to the stock level in this table. Specifically, cash induced demand for stock *i* is calculated as:

$$CID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t}.$$

$LME_{i,t-1}$ is the log market capitalization. $LBE_{i,t-1}$ is the log book equity from 1 quarter prior. $Ret12_{i,t-1}$ is the prior 12-month return. $Issue_{i,t-1}$ is the percentage increase in shares outstanding over the past 5 years. $FIPP$ is the contemporaneous flow-induced price pressure to the period of the excess returns. Only non-dividend-paying stocks that have not had any capital return over the past year are used in the regression. Stocks with market capitalizations lower than the bottom decile of NYSE and stocks at the bottom decile of percentage mutual fund holdings are filtered. All the regressor variables are standardized by their unconditional standard deviation. The t-statistics in the first 3 columns are *Newey-West* with a single lag. The t-statistics in the next 3 columns are *Newey-West* with 4 lags to account for overlapping returns.

	1 Quarter Excess Returns $(Ret_i - Rf)_{t-1\to t}$			4 Quarter Excess Returns $1/4 \cdot (Ret_i - Rf)_{t-1\to t+3}$		
$CID_{i,t-1}$	**1.11%**	**1.17%**	**1.04%**	**0.97%**	**0.83%**	**0.87%**
	(2.12)	**(2.48)**	**(2.39)**	**(2.50)**	**(2.63)**	**(2.83)**
$LME_{i,t-1}$		-0.26%	-0.13%		-0.24%	-0.30%
		(-0.61)	(-0.32)		(-0.53)	(-0.75)
$LBE_{i,t-1}$		-0.00%	0.02%		0.07%	0.22%
		(0.01)	(0.05)		(0.16)	(0.64)
$Ret12_{i,t-1}$		0.36%	0.19%		-0.01%	-0.13%
		(0.62)	(0.34)		(-0.03)	(-0.28)
$Issue_{i,t-1}$		**-0.77%**	**0.75%**		**-0.65%**	**-0.66%**
		(-4.84)	**(-4.74)**		**(-4.16)**	**(-4.18)**
$FIPP_{i,t-1\to t-1+k}$			**3.04%**			**1.97%**
			(8.23)			**(4.96)**
$Avg\ N$	803	772	772	803	772	772
$Avg\ R^2$	1.33%	3.92%	4.44%	1.26%	3.75%	4.63%

Table 8. Cash Induced Demand, Calendar Portfolios Sort

This table records monthly returns of calendar time strategies based on cash induced demand. Specifically, cash induced demand to stock i is calculated as:

$$CID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t}.$$

Panel A. This panel records the monthly excess returns and risk-adjusted alphas of market cap value weighted portfolios sorted on $CID_{i,t}$. Non-dividend-paying stocks that have not had any capital return over the past year are sorted into quintile portfolios, and the table reports the *monthly* returns of overlapping portfolio strategies that hold each portfolio for 1 (left) to 4 (right) quarters. Stocks with market capitalizations lower than the bottom decile of NYSE and stocks at the bottom decile of percentage mutual fund holdings are filtered. The sample period of returns is from January 1990 through December 2016.

		Q1 Holding Period				Q1 Through Q4 Holding Period			
		Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
CID	1	0.35%	**-0.69%**	-0.46%	**-0.54%**	0.42%	**-0.63%**	**-0.39%**	**-0.40%**
		(0.69)	**(-2.19)**	(-2.47)	**(-2.86)**	(0.84)	**(-2.12)**	**(-2.31)**	**(-2.32)**
	2	0.59%	**-0.42%**	-0.24%	-0.26%	0.55%	-0.44%	**-0.26%**	**-0.27%**
		(1.27)	**(-1.66)**	(-1.49)	(-1.62)	(1.23)	(-1.84)	**(-2.05)**	**(-2.07)**
	3	0.57%	-0.35%	-0.21%	-0.26%	0.57%	-0.34%	-0.21%	-0.19%
		(1.39)	(-1.64)	(-1.35)	(-1.58)	(1.45)	(-1.84)	(-1.68)	(-1.46)
	4	0.62%	-0.30%	-0.22%	-0.06%	**0.80%**	-0.08%	0.02%	0.13%
		(1.42)	(-1.58)	(-1.30)	(-0.36)	**(2.13)**	(-0.44)	(0.12)	(0.95)
	5	**1.19%**	**0.45%**	**0.49%**	**0.57%**	**1.06%**	**0.32%**	**0.36%**	**0.40%**
		(3.74)	**(3.07)**	**(3.34)**	**(3.91)**	**(3.33)**	**(2.22)**	**(2.62)**	**(2.93)**
	LS	**0.84%**	**1.14 %**	**0.95%**	**1.11%**	**0.64%**	**0.94%**	**0.75%**	**0.80%**
	5-1	**(2.47)**	**(3.52)**	**(4.00)**	**(4.71)**	**(2.08)**	**(3.27)**	**(3.51)**	**(3.71)**

Panel B. This table records the average time series loading of risk factors by the long-short $CID_{i,t}$ calendar time long-short portfolio strategy depicted in the previous panel for 1 quarter and 1 to 4 quarter holding periods.

	Q1 Holding Period						Q1 Through Q4 Holding Period					
	Long Short (5 Minus 1)			Long Short (5 Minus 3)			Long Short (5 Minus 1)			Long Short (5 Minus 3)		
Alpha	1.14%	0.95%	1.11%	0.80%	0.70%	0.82%	0.94%	0.75%	0.80%	0.66%	0.57%	0.59%
	(3.62)	(4.00)	(4.71)	(3.62)	(3.62)	(4.28)	(3.27)	(3.51)	(3.71)	(3.56)	(3.50)	(3.57)
Mktrf	-0.48	-0.24	-0.31	-0.29	-0.17	-0.23	-0.49	-0.28	-0.30	-0.28	-0.18	-0.19
	(-6.48)	(-4.35)	(-5.43)	(-5.74)	(-3.80)	(-4.82)	(-7.32)	(-5.50)	(-5.69)	(-6.54)	(-4.73)	(-4.73)
SMB		-0.89	-0.87		-0.43	-0.41		-0.72	-0.72		-0.34	-0.33
		(-11.64)	(-11.63)		(-6.89)	(-6.78)		(-10.60)	(-10.51)		(-6.42)	(-6.35)
HML		0.73	0.66		0.37	0.32		0.71	0.69		0.32	0.31
		(8.99)	(8.09)		(5.69)	(4.83)		(9.78)	(9.23)		(5.73)	(5.41)
UMD			-0.20			-0.15			-0.07			-0.03
			(-3.95)			(-3.74)			(-1.44)			(-0.75)
N	324	324	324	324	324	324	324	324	324	324	324	324
R^2	0.113	0.531	0.552	0.090	0.314	0.341	0.140	0.539	0.540	0.114	0.320	0.319

Table 9. Cash Induced Demand, Calendar Portfolios Sort Characteristics

This table examines the characteristics related to size and future capital returns for stocks sorted on cash induced demand.

Panel A. This panel records the average Book Equity and Market Equity Size in $ billions for portfolios sorted on $CID_{i,t}$ for selected periods of the sample.

		Q1 1990		Q1 2003		Q1 2016	
		Book Equity	Market Equity	Book Equity	Market Equity	Book Equity	Market Equity
CID	1	0.055	0.245	0.101	0.434	0.191	0.839
	2	0.059	0.171	0.176	0.556	0.216	1.103
	3	0.037	0.092	0.259	0.618	0.392	1.243
	4	0.076	0.148	0.332	0.631	0.533	1.176
	5	0.134	0.298	0.775	1.480	1.404	2.431

Panel B. This records the average share buyback and change in dividends paid quarterly by the firms in these quintile portfolios over the next 12 years. The sample covers 1990 - 2016. The portfolio initiation period is from 1990 through 2008 for the 24 Quarter Average and 1990 through 2004 for the 48 Quarter Average. That is:

$$\text{N Quarter } \Delta\text{Buyback} = \frac{1}{N}\sum_{i=1}^{N} \text{Buyback}_{i,t+i} - \frac{1}{20}\sum_{i=1}^{20} \text{Buyback}_{i,t-i},$$

$$\text{N Quarter } \Delta\text{Dividend} = \frac{1}{N}\sum_{i=1}^{N} \text{Dividend}_{i,t+i} - \frac{1}{20}\sum_{i=1}^{20} \text{Dividend}_{i,t-i},$$

and

$$\text{N Quarter } \Delta\text{Issuance} = \frac{1}{N}\sum_{i=1}^{N} \text{Issuance}_{i,t+i} - \frac{1}{20}\sum_{i=1}^{20} \text{Issuance}_{i,t-i}.$$

		12 Quarter Average			24 Quarter Average			48 Quarter Average		
		ΔBuyback	ΔIssuance	ΔDivy	ΔBuyback	ΔIssuance	ΔDivy	ΔBuyback	ΔIssuance	ΔDivy
CID	1	0.16%	-1.57%	0.02%	0.20%	-1.71%	0.03%	0.28%	-1.83%	0.05%
		(31.02)	(-10.90)	(8.99)	(36.22)	(-10.05)	(9.65)	(36.22)	(-15.48)	(9.77)
	2	0.18%	-1.67%	0.02%	0.23%	-1.83%	0.03%	0.29%	-1.61%	0.06%
		(31.66)	(-12.97)	(7.28)	(38.71)	(-10.69)	(10.82)	(36.34)	(-19.88)	(10.24)
	3	0.19%	-1.28%	0.04%	0.24%	-1.41%	0.05%	0.29%	-1.25%	0.07%
		(28.92)	(-10.69)	(10.42)	(36.78)	(-8.97)	(10.33)	(32.73)	(-11.79)	(11.68)
	4	0.21%	-0.96%	0.05%	0.26%	-0.93%	0.06%	0.31%	-1.11%	0.09%
		(27.91)	(-13.05)	(11.88)	(32.00)	(-12.03)	(14.29)	(36.77)	(-11.68)	(15.54)
	5	0.24%	-0.89%	0.06%	0.29%	-0.88%	0.09%	0.30%	-0.65%	0.12%
		(20.82)	(-6.36)	(16.18)	(25.38)	(-5.84)	(22.75)	(28.41)	(-7.02)	(17.80)
	LS	0.08%	0.69%	0.04%	0.08%	0.83%	0.06%	0.01%	1.18%	0.06%
	5-1	(8.15)	(3.25)	(10.76)	(7.83)	(3.53)	(14.22)	(1.15)	(7.99)	(9.44)

Table 10. Future Payout and Issuance Predictions

This table records Fama MacBeth regression coefficients of changes in quarterly buyback, dividend payments, and issuances over 24 quarter horizons on $\overline{CID}_{i,t-1}$ and various controls. The regressors are normalized so that their standard deviations are 1. ΔBuyback is the difference between the average N quarter future Buybacks and the average buyback from the past 5 years:

$$\text{N Quarter ΔBuyback} = \frac{1}{N}\sum_{i=1}^{N}\text{Buyback}_{i,t+i} - \frac{1}{20}\sum_{i=1}^{20}\text{Buyback}_{i,t-i}.$$

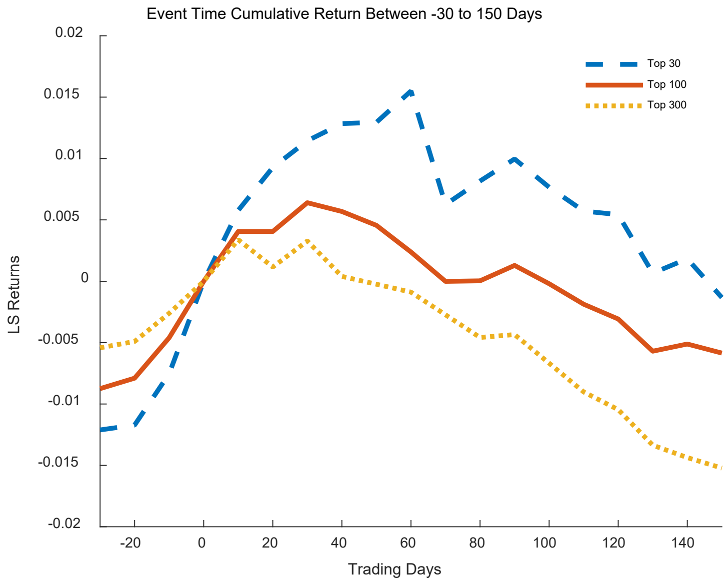
ΔDividend and ΔIssuance are calculated in the same way. The t-statistics are *Newey-West* corrected with *N* lags to account for overlapping observations.

Future quarterly average buybacks, dividends, and issuances regressed on various characteristics.

	24 Quarter ΔBuyback		24 Quarter ΔDividend		24 Quarter ΔIssuance	
$CID_{i,t-1}$	0.05%	0.01%	0.04%	0.03%	0.42%	0.65%
	(2.38)	(0.61)	(7.47)	(4.94)	(4.47)	(4.11)
$LME_{i,t-1}$		0.02%		-0.02%		-0.48%
		(1.29)		(-2.49)		(-0.81)
$LBE_{i,t-1}$		0.04%		0.02%		0.15%
		(6.69)		(2.75)		(0.21)
$Ret12_{i,t-1}$		0.01%		0.01%		0.01%
		(3.13)		(3.53)		(0.05)
$Issue_{i,t-1}$		-0.16%		0.00%		3.10%
		(-4.74)		(0.04)		(21.91)
$FIPP_{i,t-1}$		-0.01%		0.01%		0.08%
		(-2.13)		(2.32)		(0.53)
$Avg\ N$	432	417	432	417	432	417
$Avg\ R^2$	1.295%	11.011%	1.124%	1.776%	0.247%	23.032%

Appendix

A1. Cumulative Abnormal Returns During Cash Mergers.



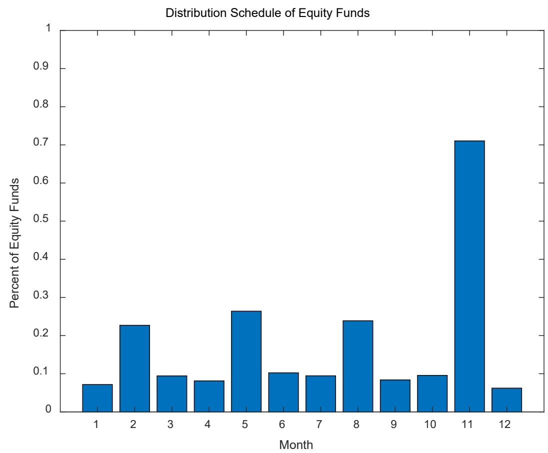
This figure plots the long-short event time cumulative abnormal returns in excess of the market return determined by *InducedBuy*. Stocks in the long-portfolio are stocks that purchased by merger-cash redeploying investors, while the short-portfolio are the unpurchased stocks.

A2. Investor Flow Calculated Using Total Fund Returns and Flow Calculated Using NAV Returns

Capital gains and dividend distributions calculated by comparing difference between total return and NAV price return per share of mutual funds.

$$Distribution_{j,t} = \left(Ret_{j,t} - Ret_{j,t}^{NAV}\right).$$

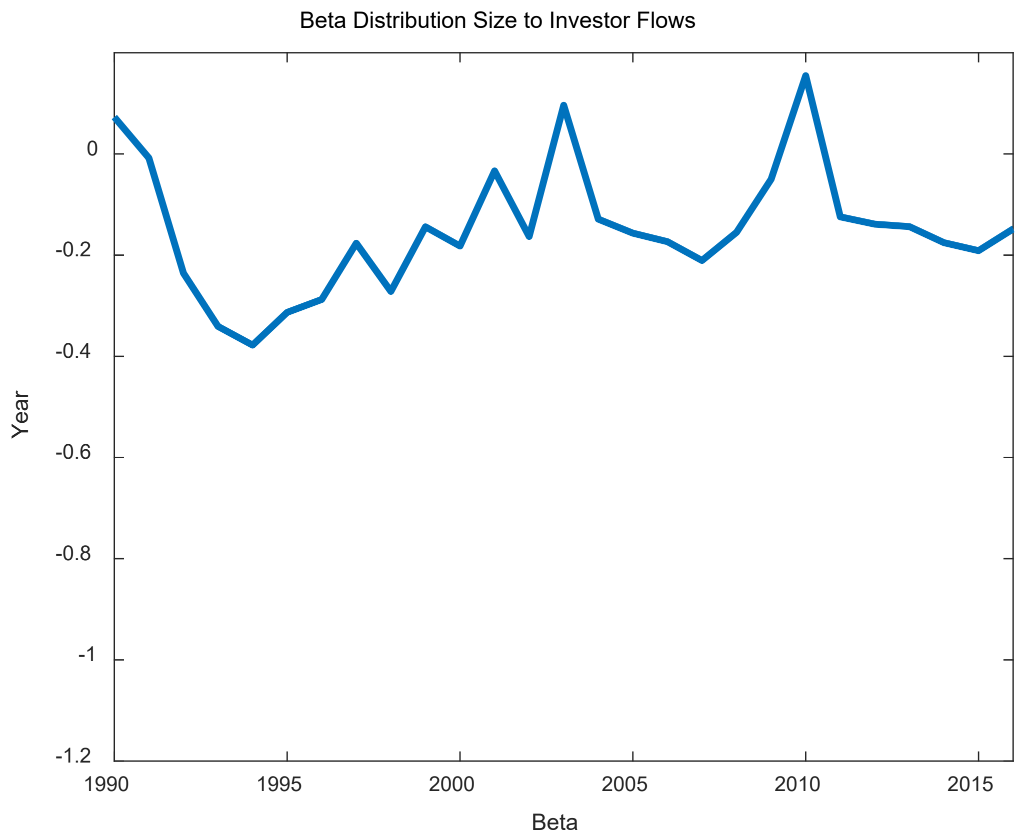
Monthly distribution schedule of Equity Open Ended Mutual Funds in the CRSP database over 1990 through 2016.



$Ret_{i,t}^{NAV}$ is adjusted for splits and mergers in shares. Here, for \$1 invested in fund, j, $Ret_{j,t}$ is the net return that includes the price return of the share plus the distribution amount. The distribution amount can be taken as cash by the investor or can be reinvested as new shares of the fund j. Investor flow can be defined as the outflow due to distribution plus other residual investor flow.

$$Inv\_Flow_{j,t} = ResFlow_{j,t} + \beta \cdot Distribution_{j,t}.$$

β can be estimated by assuming that $ResFlow_{j,t}$ is uncorrelated with $Distribution_{j,t}$. Coefficient is -0.153 (t = -9.16) for this sample period for mutual funds with at least \$10 million under management. That is, 15.3% of the distributions are returned to investors, while 84.7% is retained by the portfolio. The top panel plots time series of the beta. The bottom panel describes the panel regression.



	$Inv\_Flow_{j,t}$		
$Distribution_{j,t}$	-0.153 (-9.16)	-0.178 (-10.74)	-0.142 (-10.81)
Month Fixed	No	Yes	Yes
Fund Fixed	No	No	Yes
R^2	0.16%	1.34%	8.37%
N	1,572,254	1,572,254	1,572,254

A3. Cash Return Induced Demand, Fama MacBeth

Assuming proportional reinvestment to initial fund values, cash return are aggregated at the stock level. Specifically, Dividend- and Buyback-Induced Demand to stock *i* is calculated as:

$$DID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Div\_Flow_{j,t},$$

and:

$$BID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Buy\_Flow_{j,t}.$$

This table records the Fama MacBeth regression coefficients of average quarter excess returns on $DID_{i,t-1}$, $BID_{i,t-1}$, and various controls. $LME_{i,t-1}$ is the log market capitalization. $LBE_{i,t-1}$ is the log book equity from 1 quarter prior. $Ret12_{i,t-1}$ is the prior 12-month return. $Issue_{i,t-1}$ is the percentage increase in shares outstanding over the past 5 years. $FIPP$ is the contemporaneous flow-induced price pressure to the period of the excess returns. Only non-dividend-paying stocks that have not had any repurchasing events over the past 5 years are used in the regression. All the regressor variables are standardized by their unconditional standard deviation. The t-statistics in the first 3 columns are *Newey-West* with a single lag. t-statistics in the next 3 columns are *Newey-West* with 4 lags to account for overlapping returns.

	1 Quarter Excess Returns $(Ret_i - Rf)_{t-1\to t}$			4 Quarter Excess Returns $1/4 \cdot (Ret_i - Rf)_{t-1\to t+3}$		
$DID_{i,t-1}$	0.37%	0.48%	0.28%	0.48%	0.54%	0.41%
	(0.96)	(1.47)	(1.11)	(1.55)	(1.93)	(2.03)
$BID_{i,t-1}$	1.10%	1.13%	1.21%	0.57%	0.48%	0.72%
	(2.55)	(2.89)	(3.28)	(1.84)	(2.28)	(2.61)
$LME_{i,t-1}$		-0.26%	-0.17%		-0.21%	-0.30%
		(-0.60)	(-0.44)		(-0.49)	(-0.78)
$LBE_{i,t-1}$		0.03%	0.08%		0.05%	0.22%
		(0.07)	(0.22)		(0.12)	(0.65)
$Ret12_{i,t-1}$		0.37%	0.23%		-0.02%	-0.12%
		(0.64)	(0.40)		(-0.04)	(-0.26)
$Issue_{i,t-1}$		-0.78%	-0.76%		-0.64%	-0.66%
		(-4.91)	(-4.84)		(-4.18)	(-4.21)
$FIPP_{i,t-1\to t-1+k}$			3.03%			1.97%
			(8.34)			(4.89)
$Avg\ N$	804.18	771.56	771.56	804.18	771.56	771.56
$Avg\ R^2$	1.62%	4.08%	4.58%	1.59%	3.90%	4.76%

A4. Cash Return Induced Demand, Calendar Portfolios Sort

This table records monthly returns of calendar time strategies based on dividend and buyback induced demand. Dividend- and Buyback-Induced Demand to stock i is calculated as:

$$DID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Div\_Flow_{j,t},$$

$$BID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Buy\_Flow_{j,t},$$

Panel A. This records the monthly excess returns and risk-adjusted alphas of market cap value weighted portfolios sorted on $DID_{i,t}$. Non-cash paying stocks are sorted into quintile portfolios and the table reports the returns of overlapping portfolio strategies that hold each portfolio for varying number of quarters. The sample period of returns is from January 1990 through December 2016.

		Q1 Holding Period				Q1 to Q4 Holding Period			
		Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
DID	1	0.39%	-0.62%	**-0.36%**	**-0.43%**	0.53%	-0.49%	-0.24%	-0.25%
		(0.79)	(-1.88)	**(-2.00)**	**(-2.33)**	(1.07)	(-1.58)	(-1.49)	(-1.54)
	2	0.51%	-0.47%	-0.25%	-0.28%	0.49%	**-0.50%**	**-0.28%**	**-0.27%**
		(1.12)	(-1.83)	(-1.62)	(-1.81)	(1.09)	**(-2.05)**	**(-2.15)**	**(2.02)**
	3	0.58%	-0.37%	-0.20%	-0.24%	0.65%	-0.29%	-0.13%	-0.12%
		(1.34)	(-1.53)	(-1.23)	(-1.41)	(1.56)	(-1.41)	(-0.98)	(-0.91)
	4	**1.09%**	0.18%	**0.32%**	**0.36%**	**0.87%**	-0.02%	0.13%	0.20%
		(2.73)	(0.91)	**(2.01)**	**(2.22)**	**(2.26)**	(-0.11)	(0.90)	(1.44)
	5	**0.92%**	0.12%	0.14%	**0.31%**	**0.93%**	0.13%	0.18%	**0.29%**
		(2.65)	(0.72)	(0.86)	**(1.98)**	**(2.78)**	(0.98)	(1.40)	**(2.27)**
	LS	0.52%	**0.73%**	**0.50%**	**0.73%**	0.40%	**0.62%**	**0.42%**	**0.54%**
	5-1	(1.46)	**(2.10)**	**(2.01)**	**(3.04)**	(1.31)	**(2.11)**	**(2.03)**	**(2.59)**

Panel B. This record the monthly excess returns and risk adjusted alphas of market cap value weighted portfolios sorted on $BID_{i,t}$. Non-cash paying stocks are sorted into quintile portfolios and the table report the returns of overlapping portfolio strategy that holds each portfolio for varying number of quarters. The sample period of returns is from January 1990 through December 2016.

		Q1 Holding Period				Q1 to Q4 Holding Period			
		Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
BID	1	0.39%	**-0.67%**	**-0.52%**	**-0.57%**	0.44%	**-0.61%**	**-0.42%**	**-0.43%**
		(0.76)	**(-2.19)**	**(-2.60)**	**(-2.84)**	(0.90)	**(-2.22)**	**(-2.66)**	**(-2.65)**
	2	0.56%	**-0.45%**	**-0.34%**	**-0.33%**	0.55%	**-0.43%**	**-0.31%**	**-0.29%**
		(1.26)	**(-2.00)**	**(-2.06)**	**(-1.97)**	(1.29)	**(-2.10)**	**(-2.52)**	**(-2.32)**
	3	0.68%	-0.28%	-0.19%	-0.08%	0.76%	-0.15%	-0.07%	0.02%
		(1.63)	(-1.37)	(-1.25)	(-0.53)	(1.95)	(-0.82)	(-0.55)	(0.14)
	4	**0.82%**	-0.01%	0.05%	0.12%	**0.83%**	-0.01%	0.06%	0.09%
		(2.23)	(-0.06)	(0.33)	(0.72)	**(2.30)**	(-0.08)	(0.46)	(0.70)
	5	**1.05%**	0.31%	**0.36%**	**0.47%**	**1.05%**	**0.30%**	**0.35%**	**0.40%**
		(3.22)	(1.93)	**(2.36)**	**(3.17)**	**(3.30)**	**(2.16)**	**(2.71)**	**(3.10)**
	LS	**0.67%**	**0.98%**	**0.87%**	**1.05%**	**0.61%**	**0.92%**	**0.77%**	**0.83%**
	5-1	**(2.01)**	**(3.14)**	**(3.48)**	**(4.20)**	**(2.17)**	**(3.52)**	**(3.85)**	**(4.09)**

A5. Cash-Induced Demand, Calendar Portfolios Sort on All Stocks

This table records monthly returns of calendar time strategies based on dividend and buyback induced demand on all stocks. Specifically, Cash-Induced Demand to stock i is calculated as:

$$CID_{i,t} = \sum_j \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t}.$$

The columns record the monthly excess returns and risk-adjusted alphas of market cap value weighted portfolios sorted on $CID_{i,t}$. All stocks with market caps greater than the tenth percentile of NYSE firms and at the top 9 deciles of percentage mutual fund holdings are sorted into quintile portfolios. The table reports the returns of an overlapping portfolio strategy that holds each portfolio for one or four quarters. The sample period of returns is from January 1990 through December 2016.

		Q1 Holding Period				Q1 to Q4 Holding Period			
		Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
CID	1	0.53%	-0.46%	**-0.28%**	**-0.33%**	0.54%	-0.44%	**-0.26%**	**-0.27%**
		(1.17)	(-1.86)	**(-2.07)**	**(-2.42)**	(1.22)	(-1.88)	**(-2.21)**	**(-2.20)**
	2	0.59%	-0.25%	-0.20%	-0.17%	**0.67%**	-0.15%	-0.10%	-0.06%
		(1.69)	(-1.87)	(-1.95)	(-1.63)	**(1.98)**	(-1.23)	(-1.08)	(-0.67)
	3	**0.83%**	0.14%	0.12%	0.14%	**0.82%**	0.14%	0.13%	0.14%
		(2.92)	(1.34)	(1.15)	(1.30)	**(2.94)**	(1.41)	(1.35)	(1.36)
	4	**0.82%**	**0.23%**	0.19%	0.20%	**0.80%**	**0.20%**	**0.17%**	0.17%
		(3.28)	**(2.14)**	(1.90)	(1.90)	**(3.22)**	**(2.16)**	**(1.96)**	(1.91)
	5	**0.63%**	0.13%	0.27%	0.07%	**0.66%**	0.17%	0.06%	0.08%
		(2.92)	(1.29)	(0.43)	(1.06)	**(3.09)**	(1.66)	(0.91)	(1.31)
	LS	0.10%	0.59%	0.31%	**0.40%**	0.13%	0.61%	**0.32%**	**0.35%**
	5-1	(0.27)	(1.78)	(1.81)	**(2.34)**	(0.34)	(1.89)	**(2.04)**	**(2.19)**

A6. Fund Portfolio Level Flow and Capital Return

Summary statistics on quarterly capital return and percentage flow per mutual fund portfolio. $Inv\_Flow_{j,t}$ is the percentage investor flow into mutual fund j, that is $Inv\_Flow_{j,t} = \left(TNA_{j,t} - TNA_{j,t-1} \cdot \left(1 + ret_{j,t}\right) - MGN_{j,t-1}\right)/TNA_{j,t-1}$. Dividend-induced-capital flow, for portfolio j, is defined as:

$$Div\_Flow_{j,t} = \sum_i Weight_{i,j,t-1} \cdot Dividends_{i,t}.$$

Pro rata buyback flow, for portfolio j, is defined as:

$$Buy\_Flow_{j,t} = \sum_i Weight_{i,j,t-1} \cdot |Buyback_{i,t}|\,.$$

$Weight_{i,j,t-1}$ is the portfolio weight of asset i, by portfolio j, at t - 1. $|Buyback_{i,t}|$ is the percentage decrease in shares outstanding of asset i between t – 1 and t. $Dividend_{i,t}$ is the dividend yield of asset i between t – 1 and t. $\rho_{t,t-1}$ and $\rho_{t,t-4}$ are the autocorrelation coefficients at 1 and 4 quarters lags, respectively.

	Mean	Std	Q1	Median	Q3	$\rho_{t,t-1}$	$\rho_{t,t-4}$	N
$Inv\_Flow_{j,t}$ (1990 to 2016)	0.46%	23.62%	-4.37%	-1.42%	2.61%	0.344	0.161	81,822
$Div\_Flow_{j,t}$ (1990 to 2016)	0.35%	0.23%	0.18%	0.31%	0.48%	0.836	0.783	81,822
$Buy\_Flow_{j,t}$ (1990 to 2016)	0.43%	0.26%	0.23%	0.39%	0.58%	0.616	0.466	81,822
$Inv\_Flow_{j,t}$ (1990 to 2002)	2.17%	23.77%	-3.60%	-0.50%	4.23%	0.389	0.107	19,746
$Div\_Flow_{j,t}$ (1990 to 2002)	0.28%	0.23%	0.10%	0.24%	0.40%	0.933	0.849	19,746
$Buy\_Flow_{j,t}$ (1990 to 2002)	0.26%	0.18%	0.13%	0.23%	0.35%	0.402	0.284	19,746
$Inv\_Flow_{j,t}$ (2003 to 2016)	-0.09%	23.55%	-4.58%	-1.68%	2.10%	0.318	0.181	62,076
$Div\_Flow_{j,t}$ (2003 to 2016)	0.37%	0.22%	0.20%	0.34%	0.50%	0.798	0.762	62,076
$Buy\_Flow_{j,t}$ (2003 to 2016)	0.48%	0.25%	0.29%	0.46%	0.63%	0.581	0.412	62,076

A7. Use of Cash Returns by Passive and Active Mutual Funds

This table describes how cash return programs induce redeployment by passive and active mutual funds between 1990 and 2015. Dividends received are directly used to increase holdings, while stock buybacks exchange cash for shares with mutual fund portfolio.

Panel A. Change in portfolio holdings for funds sorted on dividend exposure. Passive (left) and active (right) mutual funds are sorted by the size of dividends received relative to their total net assets into 3 groups. This table tabulates the pooled average of 1) dividend received each quarter, 2) percentage of funds that increased their total share-holdings, 3) percentage of funds that reduced their total share-holdings, 4) change in total share-holding size (using end-of-quarter prices), and 5) residual change in total share-holding after compensating for investor inflow and outflow (residuals from quarterly regressions of change in total share-holdings on inflow and outflow).

Passive Funds	Average Div_Flow	% Funds Increasing Holdings	% Funds Reducing Holdings	$\Delta Holdings^{all}$	Residual $\Delta Holdings^{all}$
Lowest Div Funds	0.241%	59.7%	40.3%	2.94%	0.217%
				(12.3)	(1.75)
2	0.451%	61.3%	38.7%	3.20%	0.600%
				(13.9)	(4.84)
Highest Div Funds	0.633%	58.1%	41.9%	3.34%	0.850%
				(13.4)	(7.36)

Active Funds	Average Div_Flow	% Funds Increasing Holdings	% Funds Reducing Holdings	$\Delta Holdings^{all}$	Residual $\Delta Holdings^{all}$
Lowest Div Funds	0.130%	39.7%	60.3%	-0.315%	-0.611%
				(-3.12)	(-8.26)
2	0.307%	40.4%	59.6%	-0.230%	-0.144%
				(-2.39)	(-2.01)
Highest Div Funds	0.564%	43.1%	56.9%	0.312%	0.400%
				(2.86)	(4.45)

Panel B. Stocks sorted on percentage buybacks. Stocks with detectable buybacks are sorted into quintiles. Stocks without any buybacks are also grouped into a single bin. This table tabulates the pooled average of 1) buyback size, 2) percentage of mutual funds that increased their holdings, 3) percentage of mutual funds that reduced their holdings, and 4) percentage of mutual funds that liquidated their holdings of the stock in the same quarter.

	Average Buyback	% Passive Funds Increased Position	% Passive Funds Reducing Position	% Passive Funds Liquidated Position	% Active Funds Increased Position	% Active Funds Reducing Position	% Active Funds Liquidated Position
Stocks Without Buyback	0.000%	44.017%	19.786%	4.916%	35.324%	32.391%	15.855%
Lowest Buyback Stocks	0.057%	43.583%	23.431%	4.604%	33.164%	32.119%	13.944%
2	0.301%	43.667%	24.333%	3.809%	32.875%	32.391%	13.112%
3	0.730%	43.145%	25.699%	3.538%	32.908%	33.443%	13.490%
4	1.515%	42.330%	26.718%	3.601%	32.527%	34.232%	14.158%
Highest Buyback Stocks	4.062%	39.138%	28.503%	4.251%	32.834%	35.447%	16.071%

Panel C. This table describes the panel regression coefficients of buying of stocks by index mutual funds in each capital returning bin on the ex-ante percentage shares held in each bin on the full panel of stocks between 1990 and 2015. That is:

$$BuyPassive_{i,t,bin} = \frac{\sum_j Max(\Delta Holding_{i,j,t},0)(PassiveDum_j)|j \in bin_t}{\sum_j Holding_{i,j,t-1}}, BuyActive_{i,t,bin} = \frac{\sum_j Max(\Delta Holding_{i,j,t},0)(ActiveDum_j)|j \in bin_t}{\sum_j Holding_{i,j,t-1}}, \text{ and}$$

$$PercHold_{i,t,bin} = \frac{\sum_j Holding_{i,j,t-1}|j \in bin_t}{\sum_j Holding_{i,j,t-1}}.$$

Coefficients are clustered quarterly. The largest coefficient per column is highlighted in bold.

	$BuyPassive_{i,t,1}$	$BuyPassive_{i,t,2}$	$BuyPassive_{i,t,3}$	$BuyActive_{i,t,1}$	$BuyActive_{i,t,2}$	$BuyActive_{i,t,3}$
$PercHeld_{i,t-1,1}$	**0.0248**	**0.0323**	0.0042	**0.1415**	0.0333	0.0048
	(4.88)	**(3.14)**	(6.36)	**(21.43)**	(7.35)	(2.77)
$PercHeld_{i,t-1,2}$	0.0043	0.0213	0.0017	0.0595	**0.0520**	0.0213
	(1.24)	(5.53)	(1.40)	(4.85)	**(7.98)**	(7.81)
$PercHeld_{i,t-1,3}$	0.0045	0.0020	**0.0127**	0.0136	0.0370	**0.0609**
	(1.55)	(0.95)	**(3.11)**	(1.78)	(3.43)	**(9.16)**
R^2	0.0091	0.0092	0.0087	0.0695	0.0260	0.0438
N	285,654	297,559	257,522	285,654	297,559	257,522

A8. Gross Purchasing Patterns of Funds Sorted by Investors Flows

This table describes the panel regression coefficients of buying of stocks by mutual funds in the 5 investor flow bins on the ex-ante percentage shares held in each bin on the full panel of stocks between 1990 and 2016. That is:
$Buying_{i,t,bin} = \frac{\sum_j Max(\Delta Holding_{i,j,t}, 0) | j \in bin_t}{\sum_j Holding_{i,j,t-1}}$, and $PercHold_{i,t,bin} = \frac{\sum_j Holding_{i,j,t-1} | j \in bin_t}{\sum_j Holding_{i,j,t-1}}$.
Coefficients are clustered quarterly. The largest coefficient per column is highlighted in bold.

	$Buying_{i,t,1}$	$Buying_{i,t,2}$	$Buying_{i,t,3}$	$Buying_{i,t,4}$	$Buying_{i,t,5}$
$PercHeld_{i,t-1,1}$	0.208	**0.739**	0.781	0.481	0.558
	(4.05)	**(3.31)**	(1.96)	(2.59)	(3.79)
$PercHeld_{i,t-1,2}$	0.070	0.022	-0.090	0.020	-0.035
	(1.26)	(-0.37)	(-0.45)	(0.13)	(-0.67)
$PercHeld_{i,t-1,3}$	0.230	0.218	0.083	0.455	0.273
	(1.50)	(1.13)	(0.49)	(2.47)	(2.44)
$PercHeld_{i,t-1,4}$	**0.427**	0.549	0.261	**0.885**	0.269
	(2.62)	(3.02)	(1.09)	**(2.81)**	(3.43)
$PercHeld_{i,t-1,5}$	0.417	0.451	**2.225**	0.672	**0.644**
	(3.41)	(3.18)	**(1.75)**	(3.42)	**(4.10)**
R^2	2.54%	2.39%	3.36%	2.35%	3.24%
N	316,960	308,133	334,968	349,440	341,487

A9. Cash Return and Investor Flow Calculations

Dividend yield per stock is the difference between total return ($Ret_{i,t}$) and price return ($Retx_{i,t}$) each quarter:

$$Divy_{i,t} = Ret_{i,t} - Retx_{i,t}.$$

I use the reduction in shares outstanding as my measure of percentage buybacks. This measurement is readily available and comprehensive in the cross section of equities. To deal with mergers that reduce shares outstanding but are not part of a share repurchase programs, the lower limit for the reduction is restricted to -10%. However, changing this threshold to values such as -20% or -5% has no significant effect on my results.

$$Buyback_{i,t} = |\Delta SharesOutstanding_{i,t} \cdot \left(\Delta SharesOutstanding_{i,t} \in [-10\%, 0)\right)|,$$

where $\Delta SharesOutstanding_{i,t}$ is the percentage change in split-adjusted shares outstanding. See (Hanson and Greenwood 2012) for a histogram of yearly net changes in shares outstanding. The dollar values of dividends and buybacks per stock are estimated by multiplying the stock's buyback and dividend yields by its lagged market capitalization.

The dollar investor flows into equity mutual fund are calculated as:

$$\sum_i \left(TNA_{i,t} - TNA_{i,t} \cdot \left(1 + Ret_{i,t}\right) - MGN_{i,t}\right),$$

where $MGN_{i,t}$ is a compensating term for fund mergers. This important measure of investor demand serves as a benchmark throughout to compare the size of cash flows.

The rest of this paper will examine the implications of dividend and buyback dollars on institutional investor portfolios and test for price pressure in accordance with the cash return induced demand channel.

A10. Cash Mergers and Comparison to Stock Financed Mergers

Regression of net trading by investors following the delisting event. *Normalized Net Dollar Volume*$_{j,e}$, for investor j at merger event e, is the total net dollar volume (on all stocks except for the target and acquirer) originating from j in the [0, 30) trading days around divided by the total net dollar volume from j in the [-30, 0) days around a payment event. Investor portfolios must have had at least 1 million dollars of net volume in the [-30, 0) days to be matched in the sample. *Held Target*$_{j,e}$ is an indicator variable representing whether the investor account held the target of the merger prior to the merger event. Regressions are conducted separately for the top 10, 30, 100, and 300 cash (columns 1 through 4) and stock-financed (columns 5 through 8) mergers with stock retirement values greater than 1 billion dollars. The t-statistics are clustered by each merger event.

	Normalized Net Dollar Volume$_{j,e}$							
	Cash-Financed Mergers				*Stock-Financed Mergers*			
	Top 10 Mergers	Top 30 Mergers	Top 100 Mergers	Top 300 Mergers	Top 10 Mergers	Top 30 Mergers	Top 100 Mergers	Top 300 Mergers
Held Target$_{j,e}$	0.415	0.296	0.141	0.077	0.027	0.086	0.019	0.027
	(4.66)	(3.90)	(2.71)	(2.40)	(0.18)	(0.97)	(0.31)	(0.67)
Event Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investor Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,656	21,221	73,833	225,173	4,640	16,073	61,883	195,312
$Adj\ R^2$	14.8%	12.4%	11.6%	12.6%	3.6%	7.0%	9.9%	11.3%

A11. Calendar Time Portfolio and Institutional Ownership

This table records monthly returns of calendar time strategies based on cash induced demand. Specifically, cash induced demand to stock *i* is calculated as:

$$CID_{i,t} = \sum_{j} \frac{SharesHeld_{i,j,t-1}}{\sum_j SharesHeld_{i,j,t-1}} Cap\_Flow_{j,t}.$$

Panel A. This panel records the monthly excess returns and risk-adjusted alphas of market cap value weighted portfolios sorted on $CID_{i,t}$ and percentage institutional ownership. Non-dividend-paying stocks that have not had any capital return over the past year are sorted into two halves by institutional ownership, and then into quintile portfolios based on *CID*, and the table reports the *monthly* returns of overlapping portfolio strategies that hold each portfolio for 1 (top) to 4 (bottom) quarters. Stocks with market capitalizations lower than the bottom decile of NYSE and stocks at the bottom decile of percentage mutual fund holdings are filtered. The sample period of returns is from January 1990 through December 2016.

CID	High Institutional Ownership (Q1)				Low Institutional Ownership (Q1)			
	Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
1	0.54%	-0.48%	-0.25%	-0.36%	0.12%	**-0.98%**	**-0.71%**	**-0.65%**
	(1.08)	(-1.52)	(-1.22)	(-1.74)	(0.21)	**(-2.55)**	**(-2.68)**	**(-2.43)**
2	0.56%	-0.39%	-0.22%	-0.25%	0.42%	**-0.65%**	-0.44%	**-0.51%**
	(1.26)	(-1.55)	(-1.23)	(-1.38)	(0.81)	**(-1.97)**	(-1.82)	**(-2.09)**
3	0.52%	**-0.41%**	-0.30%	-0.30%	0.28%	**-0.64%**	**-0.52%**	**-0.55%**
	(1.28)	**(1.99)**	(-1.68)	(-1.68)	0.68%	**(-2.46)**	**(-2.62)**	**(-2.72)**
4	0.73%	-0.16%	-0.06%	0.03%	**1.06%**	0.15%	0.19%	0.38%
	(1.89)	(-0.83)	(-0.40)	(0.22)	**(2.43)**	(0.55)	(0.86)	(1.72)
5	**0.74%**	-0.05%	-0.03%	0.07%	**1.41%**	**0.70%**	**0.75%**	**0.82%**
	(2.17)	(-0.29)	(-0.19)	(0.44)	**(4.04)**	**(3.19)**	**(3.65)**	**(3.92)**
LS	0.20%	0.43%	0.22%	0.43%	**1.30%**	**1.68%**	**1.46%**	**1.47%**
5-1	(0.61)	(1.35)	(0.89)	(1.77)	**(3.17)**	**(4.36)**	**(4.46)**	**(4.41)**

CID	High Institutional Ownership (Q1-Q4)				Low Institutional Ownership (Q1-Q4)			
	Raw Rx	CAPM	3-Factors	4-Factors	Raw Rx	CAPM	3-Factors	4-Factors
1	0.47%	-0.56%	-0.31%	-0.34 %	0.22%	**-0.88%**	**-0.63%**	**-0.55%**
	(0.94)	(-1.80)	(-1.63)	(-1.81)	(0.41)	**(-2.64)**	**(-3.02)**	**(-2.59)**
2	0.62%	-0.33%	-0.16%	-0.14%	0.30%	**-0.76%**	**-0.56%**	**-0.57%**
	(1.43)	(-1.41)	(-1.08)	(-0.97)	(0.60)	**(-2.70)**	**(-3.19)**	**(-3.16)**
3	0.56%	-0.34%	-0.22%	-0.18%	0.55%	**-0.41%**	**-0.30%**	-0.28%
	(1.44)	(-1.80)	(-1.51)	(-1.24)	(1.27)	**(-1.78)**	**(-1.99)**	(-1.85)
4	0.70%	-0.16%	-0.10%	0.02%	**1.08%**	0.21%	0.28%	**0.37%**
	(1.91)	(-0.96)	(-0.71)	(0.18)	**(2.73)**	(0.97)	(1.80)	**(2.38)**
5	**0.76%**	-0.03%	-0.03%	0.02%	**1.36%**	**0.63%**	**0.72%**	**0.71%**
	(2.29)	(-0.18)	(-0.20)	(0.15)	**(3.98)**	**(3.21)**	**(4.12)**	**(4.02)**
LS	0.29%	0.53%	0.28%	0.36%	**1.14%**	**1.51%**	**1.35%**	**1.26%**
5-1	(0.92)	(1.74)	(1.28)	(1.66)	**(3.28)**	**(4.67)**	**(4.90)**	**(4.52)**