Accelerated Share Repurchases: Value Creation or Extraction*

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Abstract

In this paper, we hand-collect the largest sample of ASR contracts in the literature to date, 716 ASRs from 2004 to 2015, and find that ASRs have now become the second largest method of share repurchase in the U.S. We examine management's motives to initiate an ASR, finding univariate support for quarterly EPS management. However, multivariate logit results indicate firms are more likely to initiate an ASR if they would have met EPS forecasts *without* the accretive effects of an ASR. Our results primarily support the agency theory of free cash flow as we find the likelihood of conducting an ASR increasing in firms that are larger, have higher levels of cash and free cash flow, higher operating performance, but facing declining investment sets as reflected by slowing sales growth and lower M/B ratios. Contrary to the literature, we find CARs surrounding ASR announcements are significantly higher than those of OMR firms. However, post-announcement operating performance is declining for both groups.

Keywords: Payout policy, accelerated share repurchases, earnings management, signaling, agency theory.

JEL Classification: G35; G32.

"It is critical … to understand that corporate leaders' duty of care and loyalty is not to every investor or trader who owns their companies' shares at any moment in time, but to the company and its long-term owners. Successfully fulfilling that duty requires that corporate leaders … resist the pressure of short-term shareholders to extract value from the company if it would compromise value creation for long-term owners…" [Larry Fink, Chairman and CEO of BlackRock, Mar. 31, 2015]

I. Introduction

This paper examines the question of what motivates management to use privately negotiated Accelerated Share Repurchase (ASR) contracts as part of the firm's share repurchase authorization. ASR contracts are a relatively new financial innovation that enable a firm to quickly repurchase large amounts of its outstanding equity through a financial intermediary using derivative contracts. While having been around since the late 1990s, ASRs have received little attention in the literature[1] due to both their limited initial adoption and the lack of disclosure requirements prior to 2003.[2] As such, the first noticeable use of ASR contracts is observed beginning in 2004 (see e.g., Bargeron, Kulchania, and Thomas, 2011; Michel, Oded, and Shaked, 2010; and Dickinson, Kimmel, and Warfield, 2012). Using a hand-collected sample of 716 ASR contracts covering the period from 2004 to 2015, we find that at least 346 distinct firms have employed ASR contracts to buy back their shares. By absolute dollar amounts, ASRs have now become the second largest method of share repurchase in the U.S.[3] In recent years, 2013 and 2014, we find that, of all common share repurchases, ASRs comprise 9.5% ($58.95 billion) in 2013 and 10.53% ($71.21 billion) in 2014, respectively (see Figures 1 and 2). In 2015, firms reported a total ASR repurchase amount of $78.82 billion, representing 10.71% of all repurchases.[4]

An ASR contract is considered a privately negotiated repurchase by the Securities and Exchange Commission (SEC), and as such, does not qualify for "safe harbor" protection for the firm's management against charges of share price manipulation afforded to most open market repurchases (OMR) under SEC

[1] Accelerated Share Repurchase (ASR) contracts were first introduced in the literature in a working paper by Cook and Kim (2006) dealing with the use of derivative contracts to repurchase firm shares.

[2] In December of 2003, the SEC implemented new disclosure rules surrounding the repurchase of a firm's own shares through Item 703 of Regulation S-K under Section 12 of the Securities Exchange Act of 1934. As of March 15, 2004, firms are now required to disclose all share repurchase activity in their quarterly and annual financial statements (10-Qs/10-Ks) including the number of shares repurchased as well as the average price paid per share, the amount purchased under publicly announced repurchase authorizations, and the remaining amount available to be repurchased under such programs. Details of share purchases made under privately negotiated programs (including accelerated share repurchases) are to be indicated by footnote.

[3] Share repurchases first supplanted dividends as the primary form of corporate payout in 1997 (see e.g., Farre-Mensa, Michaely, and Schmalz, 2014; and Grullon and Michaely, 2002) and have since become the primary vehicle to distribute firm cash (Skinner, 2008). Open market repurchases (OMR) currently represent approximately 90% of all share repurchases (see e.g., Banyi, Dyl, and Kahle, 2008; Grullon and Michaely, 2004), with the remaining 10% made through either tender offers and/or privately negotiated contracts (Peyer and Vermaelen, 2005; Banyi et al., 2008).

[4] ASR dollar amounts are expressed in 2015 dollars adjusted for inflation using the U-CPI. Total shares repurchased are based on amounts reported in the merged Compustat/CRSP database.

Rule 10b-18.[5] However, ASRs are very different from what has traditionally been considered a privately negotiated repurchase. An ASR is a legal contract between a firm and a financial intermediary that obligates the firm to immediately repurchase a significant amount of its outstanding equity. Typically, upon contract initiation, the financial intermediary borrows the repurchasing firm's shares from institutional investors and immediately short sells them to the firm. The intermediary then covers its short position in the open market over a predetermined contractual period. The distinguishing feature of an ASR that differentiates it from other repurchase methods is the incorporation of a forward contract with the intermediary that enables the firm to ultimately pay a volume-weighted average price (VWAP) for its shares similar to the average repurchase price paid in an open market repurchase (OMR) program.[6] We find that, on average (median), ASRs target 4.18% (3.01%) of the firm's outstanding equity, representing a mean (median) dollar amount of $598.2 ($254.4) million. Of the targeted shares in an ASR, approximately 90.64% of the shares are delivered to the firm during the quarter of contract initiation and are either retired or converted to Treasury stock. As such, an ASR can best be described as a hybrid form of repurchase that combines the immediacy of share delivery, like that of a tender offer but without the associated premium, with a repurchase price similar to that of an OMR (Michel et al., 2010). Therefore, the question that arises is: What would motivate a firm's management to forego the "safe harbor" protection of Rule 10b-18 to aggressively repurchase such a large percentage of its outstanding equity?[7]

Although several researchers have attempted to address this question in the nascent ASR literature (see e.g., Akyol, Kim, and Shekhar, 2014; Bargeron et al., 2011; Chemmanur, Cheng, and Zhang 2010; Chiu and Liang, 2015; Dickinson et al., 2012; Kurt 2015; Marquardt, Tan, and Young, 2011; and Michel et al., 2010), several discrepancies exists among the findings in this research, as well as in the interpretation of the results dealing with the firm's motivation for initiating an ASR. In an attempt to uncover the motivations for the use of an ASR, researchers have focused their attention on the two primary benefits associated with its use: (1) the immediacy of share delivery and (2) the legal commitment to repurchase.[8]

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[5] In 1982, the Securities and Exchange Commission (SEC) amended Rule 10b-18 of the Securities Exchange Act of 1934 to allow firms a "safe harbor" exemption against charges of stock price manipulation when repurchasing their own shares in the open market if the repurchase confirms to four (4) conditions relating to the manner, timing, price, and volume of the repurchase.

[6] Bargeron et al. (2011) suggest that the objectives of an ASR could almost be duplicated simply through the execution of a "large, easily verifiable, expedited OMR" (p.79), especially if a firm was willing to forego the "safe harbor" protection afforded by SEC Rule 10b-18.

[7] Grullon and Michaely (2002) argue that one of the primary drivers for the increased use of share repurchases to distribute firm cash over the last several decades, starting in the early 1980s, was the modification of SEC Rule 10b-18 (safe harbor) in 1982 that prevented the firm's management from being sued for share price manipulation when repurchasing firm shares (see Footnote 4 for a discussion of the requirements). Additionally, Lazonick (2014) proposes that misaligned compensation incentives, accompanied by the ability to evade charges of share price manipulation under SEC Rule 10b-18's 'safe harbor' provisions, has led management to disgorge the majority of the firm profits through massive open market repurchases.

[8] See e.g., Allen and Michaely (2003), Dittmar (2000), and Grullon and Ikenberry (2000) for a review of the early motivations put forth in the corporate finance literature dealing with share repurchases. Farre-Mensa, Michaely, and Schmaltz (2014) provide a

First, the ability to immediately repurchase a significant amount of outstanding equity, as well as the acceleration in the reduction of shares outstanding, have been suggested as motivations for firms seeking either to deter takeover attempts or to manage reported quarterly EPS. Akyol et al. (2014) find that firms conducting ASRs were more likely to have been the target of takeover rumors in the 12 months prior to initiating an ASR than firms only conducting OMRs; however, they find that these firms are still more likely to receive takeover bids after the ASR announcement, casting doubt on the deterrent effect of an ASR. Similarly, Bargeron et al. (2011) find that firms that are more likely to conduct an ASR have been the target of a takeover attempt in the 6 months prior to an ASR. However, in stark contrast, Chemmanur et al. (2010) find no significant difference in the likelihood of being a takeover target between OMR and ASR firms in the 12 months prior to the repurchase announcement.

In relation to the use of an ASR as an earnings management tool, Dickinson et al. (2012) suggest that firms enjoy immediate, accretive effects of repurchases on reported EPS through the use an ASR while avoiding any unrealized losses (or gains) on the forward contract under current GAAP.[9] They further report that the market discounts the reported earnings of ASR firms relative to non-ASR firms, indicating that the earnings of ASR firms are misrepresented. Marquardt et al. (2011) find that firms are more likely to employ ASRs when annual CEO bonus compensation is linked to EPS, as well as when the repurchase is accretive. Bargeron et al. (2011) find some univariate support for the use of ASRs to manage earnings; however, in multivariate logit regressions, none of the coefficients on their proxy variables for earnings management are significant. Akyol et al. (2014) find no evidence linking the choice of an ASR to the number of outstanding and exercisable executive options or the relationship between the CEO's annual bonus and reported EPS.[10] Additionally, Chemmanur et al. (2010) report that executives in ASR firms have significantly less equity based compensation in the form of options than executives in OMR firms, which they suggest contradicts the earnings management motive for an ASR.

Second, as ASRs are legally binding contracts, the firm's legal commitment to repurchase is often seen as sending a stronger (or more credible) signal to the market than the announcement of an OMR. Chemmanur et al. (2010) find that ASR firms have lower valuation ratios than OMR firms, consistent with management's desire to signal undervaluation. They also report that the market reacts more positively and significantly to the announcement of an ASR relative to an OMR. Additionally, Chemmanur et al. find that ASR firms earn higher profit margins in the four quarters post-announcement than OMR firms, suggesting

more recent, comprehensive review of payout literature with attention focused on the growth of share repurchases relative to dividends over the last several decades.

[9] Bens, Nagar, Skinner and Wong (2003) and Hribar, Jenkins, and Johnson (2006) both define an 'accretive' share repurchase as one in which reported EPS are increased by at least $0.01.

[10] See e.g. Bens, Nagar, Skinner and Wong (2003), Fenn and Liang (2001), and Kahle (2002) for a discussion of the link between share repurchases and executive and/or employee stock options.

that management has positive inside information prior to the ASR announcement. Bargeron et al. (2011) report somewhat contradictory findings in relation to the signaling effect of an ASR. They find that pre-announcement cumulative abnormal returns (run-up) for ASR firms are indistinguishable from zero while non-ASR firms have significantly negative pre-announcement abnormal returns, findings which contradicts signaling undervaluation as a motive for an ASR. They confirm this finding in logit regressions in which the coefficient on prior stock performance is positive and highly significant. However, upon decomposing the market-to-book ratio into firm, sector and long-run components per the method found in Rhodes-Kropf, Robinson, and Viswanathan (2005), they find that the likelihood of conducting an ASR is significantly and negatively related to the "*firm-specific deviation in value*" (p.80), providing support for the undervaluation motive for an ASR. Additionally, Bargeron et al. report that 3-day CARs surrounding ASR announcements are positive and significant at 1.42%, but slightly less than those from non-ASR repurchases (1.46%), further casting doubt on the use of an ASR to signal undervaluation. Michel et al. (2010) report 3-day CARs associated with ASR announcements (1.3%) are significantly lower than those of OMR announcements reported in the literature. They also report a negative post-announcement drift of 8.5% in the nine months following an ASR announcement, contrary to the positive long-run abnormal returns found in the OMR literature. They suggest this finding clearly contradicts the use of ASRs to signal undervaluation.[11]

The results from the ASR literature are also mixed in terms of whether ASR helps alleviate the agency cost of overinvestment by returning excess cash to shareholders. Chemmanur et al. (2010) find that ASR firms have significantly less cash and higher payout ratios than OMR firms, contradicting with the use of ASRs to return excess cash. Bargeron et al. (2010) confirm that ASR firms have less cash than non-ASR firms; however, they find no significant differences in free cash flow between the two groups. They also find that, in multivariate regressions, the coefficients on cash and free cash flow never enter significantly, casting doubt on the agency theory of free cash flows. However, the coefficient on the log of the firm's market-to-book ratio is negative and highly significant, suggesting that firms faced with declining investment opportunities commit to return excess cash to avoid overinvestment. Lastly, they find robust support that a firm may initiate an ASR to return cash from recent asset sales. Michel et al. (2010) argue that firms with weak growth prospects, as evidenced by the negative post-announcement drift associated with an ASR, have less need for the financial flexibility associated with excess cash, and therefore may use ASR to signal the desire to distribute cash to shareholders. They suggest, however, that if an ASR was employed to signal the intent to distribute excess cash, the abnormal announcement return for ASR should be larger than that for OMR, contradictory to what they found.

[11] Ikenberry, Lakonishok, and Vermaelen (1995) and Peyer and Vermaelen (2005, 2009) report significant long run abnormal returns following OMR announcements.

Thus, the only consensus that appears to exists in the nascent ASR literature is that the underlying motivation for an ASR must be tied to the ability to quickly repurchase a large amount of the firm's outstanding equity.[12] While the possibility exists that a firm initiates an ASR to send a stronger signal to the market,[13] the information content of the *signal* remains unclear. In a recent survey of payout literature, Farre-Mensa, Michaely, and Schmalz (2014) state that "*the literature has not settled on the importance of the signaling value, or more generally, the information content, of ARSs relative to conventional OMRs …* [nor has] *the matter regarding the market impact of ASRs … been settled.*" (p.125) These confounding implications can be attributed to the fact that no centralized database exists for ASR contracts which forces researchers to hand-collect data on ASR contracts. As such, substantial variation is often found among the differing data sets used in the nascent ASR literature, primarily due to identification issues. Farre-Mensa et al. argue that "… *the difference in* [ASR] *results seems to be driven by subtle variations in the way the papers search for announcements and eliminate duplicate observations, which, in turn, results in substantial variations in sample size and composition*." (p.125) This identification problem is a result of both the incipient nature of ASRs and the ambiguous verbiage in repurchase announcements.[14] Additionally, the approach to identify and classify ASRs varies across studies.[15] For example, in working papers, Cook and Kim (2006), Chemmanur et al. (2010), and Marquardt et al. (2011) treat ASRs as an entirely new form of share repurchase that exists outside of the firm's OMR program. Conversely, Bargeron et al. (2011) and Michel et al. (2010) argue that ASRs cannot be separated from the firm's repurchase program, which often includes both OMR and ASR components that may or may not be announced simultaneously.[16] This has led to substantial differences in the size of ASR samples and the inclusion of

[12] Bargeron et al. (2011) find support for the use of ASRs in relation to their "credibility and immediacy hypothesis." (p.72) Michel et al. (2010) suggest that "from the company's perspective … the main advantage of ASRs over OMRs ... [is] obtaining the shares quickly." (p.14)

[13] Michel at al. (2010), Bargeron et al. (2011) and Chemmanur et al. (2010) all argue that the relative large size of an ASR compared to an OMR, accompanied by the firm commitment (legal requirement) to repurchase, should send a stronger signal to the market.

[14] Bargeron et al. (2011) stress the necessity of verifying the announcements of 'accelerated' repurchase transactions with the SEC due to firms often announcing the 'acceleration' of their open market repurchase (OMR) programs through public announcements. Some of these accelerated repurchase announcements are misidentified in the early literature as ASR contracts, when in fact they were simply an announcement of the firm's proposed *acceleration* of its existing open market repurchases. To distinguish their results, Bargeron et al. present the example of Microsoft's $19 billion dollar 'accelerated' repurchase in 2005, which is not an actual ASR contract, but was apparently misidentified in the Chemmanur et al. (2010) data as an ASR.

[15] Bargeron et al. (2011) illustrate this issue by contrasting their data sample to that of Chemmanur et al. (2010): *"*... First, Chemmanur et al. drop program authorization announcements where a firm includes the option to execute the program via non-OMR transactions, e.g., privately negotiated repurchases, etc. Second, Chemmanur et al. conclude that, when an ASR from their hand-collected sample is also reported in SDC, SDC has erroneously classified an ASR as an OMR, so they drop these ''OMRs'' from their sample. …our treatment of ASRs as part of repurchase programs is also distinct from that of Chemmanur, Cheng, and Zhang who classify firms as strictly conducting OMRs versus ASRs which is not consistent with certain features of the data that reveal how ASRs are used by firms. Thus, the differences in results and conclusions across the two papers are largely attributable to … fundamental differences in sample construction." (p. 76)

[16] Michel et al. (2010) find that 85% of the ASRs in their study came from companies with ongoing open market repurchase programs (OMRs) and that by size, the ASRs often represented over 50% of the total repurchase programs. Bargeron et al. (2011) report that the average number of shares repurchased via each ASR in their study was approximately 58% of the total authorized

misidentified *accelerated* open market repurchase (OMR) programs in current research. As a remedy to this situation, Farre-Mensa et al. suggest that "*the literature will settle on more definitive answers regarding the signal value and market impact of ASRs only once larger and more standardized datasets can be assembled*." (p.125)

In this paper, we hand-collect the largest sample of ASR contracts in the literature to date, 716 distinct ASR contracts over the period from 2004 to 2015, to examine the firm's motives for conducting an ASR. Being cognizant of the identification issue associated with the ASR data used in previous studies, we first hand-collect information relating to the mention of an ASR from multiple news sources and then confirm each individual mention through regulatory filings found in the SEC's online Edgar database.[17] Consistent with the suppositions of Bargeron et al. (2011) and Michel et al. (2010), we find that 664 of the 716 ASR contracts (92.74%) are part of a firm's new or existing repurchase authorization, while only 52 ASRs (7.26%) are 'stand-alone' programs, solely authorized or authorized in addition to, but independent of, the firm's existing repurchase authorization.[18] By focusing our study on the firm's choice to conduct an ASR as part of its larger, overall repurchase authorization, or initiating it independently, as opposed to simply conducting an OMR, we attempt to resolve the issue regarding the information content of an ASR *relative* to that of an OMR. And for those 74% of firms that choose to publically announce an ASR, we seek to uncover the information the firm is conveying (*signaling*) to the market.

Given the characteristics of an ASR contract, we follow previous literature in focusing on motivations to conduct an ASR bound up in either the immediacy of share repurchases or the ability to send a more 'credible' signal to the market, or both, as these motivations are not mutually exclusive. Both Bargeron et al. (2011) and Michel et al. (2010) conclude that a firm's motive for the use of an ASR should be closely associated with the benefits of the immediacy of repurchase. Thus, we focus our initial examination on earnings management as a possible motivation for the use of ASR.[19] An ASR allows the firm to quickly reduce the number of shares outstanding used to compute its quarterly reported EPS. As

shares in each firm's repurchase program. These findings suggest that most ASR programs are not totally independent of the firms' open market repurchase programs. Akyol et al. (2014) report finding 79 ASR announcements that occurred simultaneously with other repurchase announcements, which they argue supports the idea that an ASR may be part of a larger repurchase program.

[17] See Section 3 for a complete description of our data collection process.

[18] Of the 530 publically announced ASRs, 149 (28.11%) are announced 'simultaneously' as part of a new (or updated) repurchase authorization, while 329 (62.08%) are announced as part of a pre-existing authorization, 'subsequent' to the original repurchase authorization announcement.

[19] We limit our focus to earnings management as a primary motive for an ASR based on the immediacy of repurchase. While we certainly agree that an ASR could serve to function as a deterrent to takeover bids (and attempt to control for this in a multivariate setting), we are unable to find a significant amount of takeover rumors (or bids) in the SDC Mergers and Acquisitions database. Banyi et al. (2009) discuss issues with the SDC that result in capture rates of approximately 50% for OMR announcements. We assume this may also be the case for takeover rumors (bids). Due to time constraints, we do not attempt to hand-collect data on possible takeover rumors and/or bids for both ASR and non-ASR (OMR-only) firms over a 12-year period.

such, we empirically examine whether firms use ASR contracts to meet or beat analyst quarterly consensus EPS forecasts.

Bargeron et al. (2011) and Michel et al. (2010) also suggest that due to an ASR contract's binding legal requirement to repurchase, as well as the relative size of the repurchase, an ASR should send a more *credible* signal to the market. While traditional signaling (asymmetric information) theory suggests than firms announce OMRs to send a costly signal to the market of managements' view that firm shares are currently undervalued in relation to private information about the firm's positive future prospects (see e.g. Bhattacharya, 1979; Miller and Rock, 1985; Vermaelen, 1981; Ikenberry, Lakonishok, and Vermaelen, 1995), Farre-Mensa, Michaely, and Schmalz (2014), in a recent survey of payout literature, conclude that empirical evidence casts doubt on the validity of the signaling theory as a primary motivation for repurchasing firm shares. Instead, Farre-Mensa et al. suggest that the agency theory of free cash flow (Jensen, 1986; Grullon and Michaely, 2004) is a more empirically, plausible answer to the question of why firms *generally* repurchase shares. In support, they cite several recent empirical works including Grullon and Michaely (2004), who find that firms that announce OMR programs do not experience gains in operating performance in the three years' post-announcement, a finding which contradicts the implied gains in profitability under traditional signaling theory. Grullon and Michaely suggest that the positive abnormal market returns surrounding the announcement of an OMR are in response to management's commitment to avoid the agency cost of overinvestment by returning excess 'free' cash. Therefore, we focus on the free cash flow theory as a possible motive for an ASR. This motive may be bound up in the immediacy of repurchase, as well as the desire to signal the market of the commitment to avoid overinvestment. Thus, we empirically examine the free cash flow theory in conjunction with our analysis of earnings management by considering the differences in firm characteristics between firms that conduct ASRs and those that only conduct OMRs (non-ASR firms).[20] Additionally, logit regressions to test for earnings management also reveal key determinants of the likelihood of conducting an ASR. To compare our results to the previous ASR literature, we also consider signaling undervaluation as a possible motive for an ASR and test accordingly.

To test for earnings management, we extend the analysis of Hribar et al. (2006), who find that firms that would have missed analyst EPS forecasts by one or two cents exhibit a disproportionate likelihood of an accretive (OMR) share repurchase. To compare ASR firms with non-ASR firms, we condition only on firms that have positive quarterly repurchases to eliminate the endogeneity issue associated with the decision to repurchase. Univariate results reveal that 56.03% of the quarterly repurchases made by ASR-

[20] Non-ASR firms are firms that have positive share repurchases of at least $10K in the quarter, but that do not initiate an ASR during the same quarter. As Skinner (2008) reports that approximately 90% of share repurchases are conducted as OMRs, as well as the fact that tender offers are virtually non-existent, we assume that non-ASR firms utilize OMR as their primary method of share repurchase.

firms are accretive compared to only 40.27% of those made by non-ASR firms. Additionally, we find that 29.8% (25.2%) of repurchases made by ASR (non-ASR) firms enable them to meet or exceed analyst quarterly EPS forecasts in the current quarter. In multivariate logit regressions, we find that the likelihood of initiating an ASR increases in both the accretive nature of the repurchase and the *positive* pre-repurchase earning surprise (i.e., the earnings surprise calculated without the accretive effects of the repurchase). This finding first confirms the univariate result that firms tend to initiate ASRs when the repurchases are accretive to earnings. Second, and more interestingly, this finding shows that a firm is more likely to initiate an ASR if it would have met or exceeded its EPS forecast *without* the accretive effects of the ASR. Thus, our results provide evidence that ASRs are used for short-term earnings management for some firms, while they are also employed for other motives, especially for those firms with strong earnings performance prior to the repurchase.

As part of our earnings management analysis, we compare firm characteristics between ASR firms and non-ASR firms. Our univariate results are most consistent with the agency theory of free cash flow. While both ASR firms and non-ASR firms have similar levels of cash and leverage, ASR firms are significantly larger, less financially constrained, have higher free cash flow, better pre-repurchase operating performance, and are more profitable than non-ASR firms. Additionally, ASR firms appear to be maturing in their life-cycle as their market-to-book and rate of sales growth (while still positive) are less than non-ASR firms suggesting that larger, more mature firms are likely to commit to return excess cash to shareholders through an ASR (Grullon and Michaely, 2004; Grullon, Michaely, and Swaminathan, 2002). Interestingly, we find that median pre-repurchase abnormal returns to ASR firms are indistinguishable from zero and, in contrast to prior studies, find no significant difference between pre-repurchase abnormal returns of ASR and non-ASR firms. This finding clearly casts doubt on the use of an ASR to signal undervaluation.

Our results from multivariate logit regressions also provide support for the agency theory of free cash flow. We find the likelihood of conducting an ASR is increasing in both the levels of cash and free cash flow. Additionally, firms are more likely to initiate an ASR when their operating return on assets (OROA) is higher, suggesting that firms generating higher operating income are more likely to disgorge cash through an ASR. As predicted by the free cash flow theory, larger and more mature firms with a declining investment opportunity set (as reflected in lower market-to-book ratios) are also more likely to return excess cash through an ASR. We next conduct matched-pair conditional logit regressions. Here, our results further strengthen support for the free cash flow hypothesis. The firm's level of cash is positively and significantly (1% and 5%) related to the likelihood of including an ASR. In addition, free cash flow continues to have a significant and positive impact on the use of an ASR. Both findings indicate that disgorging excess cash may be a motive for firms to choose an ASR. We also continue to find that the coefficient on operating return on assets is positive and significant suggesting that highly profitable firms

are likely to return cash through an ASR. We find that the coefficient on 3-year sales growth is now negative and significant in several models as well as the firms market-to-book ratio, supporting the notion that as growth slows down in these large firms, the propensity to payout cash through an ASR increases. Interestingly, we find some limited support for the signaling theory in our matched logit regressions as the coefficient on prior stock performance (run-up) is negative and significant in several regression specifications, suggesting that, among repurchasing firms with similarly matched characteristics, a firm is more likely to initiate an ASR if it experienced negative abnormal returns prior to the repurchase.

We attempt to further disentangle the signaling information found in the announcement of an ASR versus that of an OMR by focusing on the market response surrounding the repurchase announcement. Using standard event methodology, we calculate 3-day (and 5-day) CARs surrounding ASR and OMR announcements. Contrary to Bargeron et al. (2011) and Michel et al. (2010), we find that CARs surrounding ASR announcements are higher than those associated with only OMRs. Specifically, we find mean (median) 5-day CARs surrounding ASR announcements of 1.95% (1.53%) are significantly higher than those associated with non-ASR firms of 1.37% (1.16%). We further attempt to verify the determinants of the markets' positive response by regressing the 3-day (5-day) announcement CARs against variables for the announcement type and percent of equity sought (as well as the earnings management and control variables from our logit regressions). We find that the coefficient on the inclusion of an ASR is positively and significantly related to the 3-day (5-day) CARs. Thus, based on the short-term announcement effects of an ASR, we conclude that the market views ASRs as value-increasing events.

To further examine the signaling effects of an ASR, we follow the methodology of Lie (2005) by examining the post-repurchase operating return on assets (OROA) over the subsequent 8-quarters. We find that both ASR firms and non-ASR firms exhibit significant declines in operating performance following announcement. While, on average, OROA declines by 3.96% for ASR and 5.15% for OMR firms, the difference between the two groups is not significant. Thus, the results suggest that ASR firms experience a similar level of decline in operating performance as OMR firms following the repurchase.[21] To sum up, although ASR firms are associated with larger announcement returns than OMR firms, the pre-announcement CAR is not significantly different between the two groups and the long-term post-announcement effects as measured by the operating returns are negative for both ASR and OMR firms. The above results suggest that signaling undervaluation is unlikely to be a primary motivation for management's use of an ASR.

[21] Here we follow Lie (2005) and focus only on post repurchase operating performance for firms that repurchase at least 1% of their outstanding equity during the quarter. Lie reports that firms that repurchase less than 1% experience no significant 'relative' (performance adjusted) increase in operating performance.

Taken together, these findings suggest that ASR announcements lead to a more positive short-term market reaction than OMR announcements. In addition, the market responds more favorably to a purchase conducted by firms with strong operating performance at or prior to the announcement and/or more cash on hand. The ASR firms tend to be those with solid profitability but reduced investment opportunity sets, and the market responds favorably to these firms due to their commitment to distribute excess cash and avoid the agency cost of overinvestment. However, both ASR and OMR firms experience a decline in long-term operating performance after the announcement. Overall, our results provide support for the free cash flow explanation, but not the signaling undervaluation hypothesis.

Our study makes important contributions to the ASR literature by significantly extending previous work (such as Bargeron et al., 2011) on a firm's motives for the inclusion of an ASR. First, we use a hand-collected sample of 716 ASRs from 2004 to 2015, which is over two times larger than the largest sample used in the ASR literature up to date. This allows for an extensive examination of the unresolved issues associated with the signaling and information content of an ASR (Farre-Mensa et al., 2014). Contrary to the ASR literature, we find that 25.98% (186 out of 716) of ASRs are conducted without a public announcement. As most of the existing studies on ASR include only publically announced ASRs, our sample allows us to implications of the use of ASR based on a comprehensive sample of ASRs.[22] Second, we extend beyond the current ASR literature by investigating whether firms use ASRs in lieu of (or in addition to) open market repurchases to meet or beat the analyst earnings forecasts. Here, our study is related to those of Kurt (2015) and Marquardt et al. (2011), although there are several distinctions. While Kurt (2015) also examines the use of ASRs to manage quarterly EPS, like much of the early literature, his focus is solely on the use of ASRs to manage earnings. In contrast, as we find that over 92% of ASRs are conducted as part of the firms "open" market share repurchase authorization, we concentrate on the firm's decision to include an ASR as part of the firm's larger repurchase authorization and therefore condition on (all) firms that repurchase in the quarter in order to deal with the endogenous decision to repurchase. Also like much of the extant ASR literature, Kurt only focuses on 'announced' ASRs. Here we also differ by including all ASRs (announced and unannounced) to seek to determine if firms are quietly attempting to manage earnings through repurchases. Kurt chooses to drop ASRs from his search if they don't have a specific announcement (or effective date) and, like Bargeron et al. (2011), uses the subsequent date of a 10-Q or 10-K as an announcement date if he is unable to determine the actual announcement (representing over 8% of his sample). While Marquardt et al. (2011) also link ASRs to EPS, they focus on managements' use of ASRs to reach the level of EPS necessary to trigger CEO cash bonus. Additionally, their approach to treat ASR as a new form of repurchase that is completely apart from the firm's OMR authorization is

[22] Only 530 distinct ASR contracts (74.02%) out of our sample of 716 ASRs were publically announced either a press release or an 8-K filing with the SEC.

inconsistent with the method used in other studies in the literature and the fact that many ASRs are simultaneously initiated along with an OMR. Third, our study contributes to the earnings management literature associated with the use of share repurchases to manage reported EPS. In this regard, our work is related to Hribar et al. (2006) as well as Bens et al. (2003), who find that firms repurchase shares to meet an earnings benchmark, either an endogenous benchmark such as the firm's historical growth rate or an exogenous benchmark such as the analyst earnings forecasts. However, these studies focus on the use of open market repurchases (OMRs) to manage EPS. We add to this line of research by examining the firm's decision to initiate an ASR, *relative* to an OMR, to conduct short-term earnings management. Fourth, we explore whether ASRs send a more credible signal to the market regarding undervaluation than OMRs. Finally, we present evidence that maturing and low-growth firms are more likely to employ ASRs than OMRs to convey their commitment to return excess cash to investors, thus alleviating the agency cost of overinvestment.

The remainder of the paper proceeds as follows. Section 2 provides background and hypothesis development. Section 3 provides details about our ASR sample selection and summary statistics. Section 4 provides the empirical analysis of the earnings management and free cash flow explanations. In Section 5 we examine the signaling and free cash flow hypotheses by examining the post-announcement operating performance, short-term market reaction and long term abnormal returns of the repurchasing firms. Section 6 offers concluding remarks.

2. Literature Review and Hypothesis Development

2.1 Accelerated Share Repurchases

An accelerated share repurchase is a privately negotiated repurchase wherein the issuer contracts with a financial intermediary, most often an investment bank, for the immediate or accelerated purchase and delivery of the targeted shares. The intermediary typically borrows 80% or more of the targeted shares from institutional investors and immediately shorts them to the issuer at the closing price on the day of contract initiation.[23] The intermediary then covers its short position by purchasing shares in the open market over a contractual period that ranges from a few months to a year, thus establishing a volume-weighted average price (VWAP) for the repurchased shares. Upon initiation of the ASR, the issuer enters a long forward contract with the intermediary to eliminate the price risk faced by the intermediary while it covers

[23] During the early adoption of the use of ASRs, firms typically paid the full amount of the stated contract up front and received 100% of the targeted shares, typically priced at the close on the day of contract initiation. However, this resulted in the firm assuming an unlimited amount of exposure on the forward contract. More recently, issuers and intermediaries have established minimum and maximum repurchase amounts as well as price floors, ceilings, and collars during an initial pricing estimation period. As such, firms now generally receive an initial minimum stated amount of shares in the ASR contract, typically 80% to 90%, and then receive the balance of the shares at settlement.

its short position in the open market. At maturity of the forward contract, if the VWAP is higher than the initial price paid by the issuer, the issuer will settle the forward by either delivering cash or additional shares to the intermediary. If the VWAP is lower, the intermediary has the option to deliver additional shares (which is almost always the case) or to refund cash to the issuer (see Figure 3). Either way, the issuer ultimately pays the VWAP for its shares (Pagach and Branson, 2007). In the earlier part of our sample period the intermediary charged the issuer a fee, often as high as 6% of the total ASR amount, for acting in this capacity (Dickinson et al., 2012); however, in the later half, intermediaries frequently incentivized issuers to enter ASR contracts by offering a discount to the VWAP.

Two characteristics that distinguish an ASR from an OMR specifically deal with (1) the timing and (2) the firm's commitment to repurchase. First, a substantial percentage of the shares purchased via an ASR are delivered to the firm within a few days of the contract date and are either immediately retired or become designated as treasury stock depending on the firm's state of incorporation. Either way, the delivered shares are immediately deducted from the firm's outstanding share count and are no longer used in calculating earnings per share.[24] In contrast, shares acquired through an OMR are often purchased over a period of one to three years after the firm publically announces its repurchase authorization (Stephens and Weisbach, 1998) and are quietly retired or converted to treasury stock.[25] As such, the market is often unaware of the actual timing of the open market repurchases since firms are only required to report their repurchase activity quarterly with the SEC (Lie, 2005). While either method results in the firm ultimately paying a volume weighted average price (VWAP) for its shares, the effects of an ASR are more immediate in reducing the firm's outstanding share count. Therefore, shares repurchased via an ASR will have a much earlier accretive effect on the firm's reported EPS than those repurchased through an OMR (Dickinson et al., 2012). We conjecture that a firm is motivated to choose an ASR due to the immediacy of repurchase and/or the commitment to repurchase its shares.

2.2 Earnings Management Hypothesis

Prior research suggests that the need for immediacy may stem from the desire to deter a rumored takeover attempt or to manage reported EPS.[26] There exists an extensive literature on earnings management

[24] EPS is calculated as net income divided by the 'weighted average common shares outstanding' during the quarter. The accretive (denominator) effect of a share repurchase on calculated EPS thus depends on the actual 'timing' of the repurchase during the quarter. As such, shares repurchased earlier in the quarter have a greater accretive effect than those received near the end.

[25] Stephens and Weisbach (1998) find that, on average, firms only repurchase approximately 74% to 82% of the stated target shares in their OMR announcement. Additionally, they report that as many as 10% of the firms repurchase less than 5% of their targeted shares, with a substantial number of firms failing to repurchase any shares at all.

[26] Akyol, Kim, and Shekhar (2014) examine the use of ASRs to deter takeover attempts and find that firms that use ASRs are more likely to have been the subject of a takeover attempt (or a rumored takeover) in the twelve months prior to the initiation of an ASR. However, they find that even after completing an ASR, these firms are still as likely to receive takeover bids as firms that did not conduct an ASR. Based on these findings, Akyol et al. conclude that ASRs may not be effective as takeover deterrents. Bargeron et al. (2011) control for the effects of takeover attempts during the six months prior to announcement and find similar results to Akyol, Kim, and Shekhar (2014).

(see e.g. Brown and Caylor, 2005; Burgstahler and Dichev, 1997; Degeorge, Patel, and Zeckhauser, 1999; Graham, Harvey, and Rajgopal, 2005; Skinner and Sloan, 2002); however, much of this literature focuses on the use of accruals to manage reported net income. In contrast, several studies have recently begun to examine the use of share repurchases to manage quarterly reported EPS with the focus on incentive compensation. Dittmar (2000), Fenn and Liang (2001), and Kahle (2002) report a strong and positive relation between executive stock options and repurchases used to offset the potential dilutive effect of exercise on EPS. Bens et al. (2003) report that executives base repurchase decisions on a desire to manage the dilutive effect of the total exercisable employee stock options (ESOs). Cheng, Harford, and Zhang (2015) find that a firm is more likely to conduct an accretive share repurchase when the CEO's bonus is explicitly tied to the reported EPS and the pre-repurchase EPS is just below the threshold needed to trigger the bonus. A related strand of earnings management literature focuses on the use of repurchases to meet or exceed an earnings benchmark. Bens et al. (2003) find that managers tend to increase share repurchases when earnings fall below a level required to maintain a historical or targeted rate of EPS growth. Hribar et al. (2006) find that managers frequently use open market repurchases to meet analyst quarterly consensus EPS forecast. They find a disproportionate amount of accretive share repurchases for firms that would have missed analysts' forecast by only one or two cents a share. In a related working paper, Kurt (2015) finds some univariate support for the use of *announced* ASRs to meet analyst EPS forecasts. Myers, Myers, and Skinner (2007) report that "… *managers appear to strategically time stock repurchases to boost reported EPS when they would otherwise decrease* …" (p. 251) to maintain a string of 20 consecutive quarters of EPS growth.

In a survey of 384 financial executives, Brav, Graham, Harvey, and Michaely (2005) report that three-fourths of the respondents indicated that boosting reported EPS factors into repurchase decisions. Michel et al. (2010) suggest that the motivation to initiate an ASR may stem from the firm's desire to increase EPS. While not empirically testing their supposition, they report that most ASR announcements are clustered in the second and third months of each fiscal quarter, which they suggest is indicative of management's attempts to control for anticipated earnings shortfalls. Graham, Harvey, and Rajgopal (2005) report that management feels that it must beat analyst quarterly earnings forecast to build credibility and preserve its reputation in the capital markets, to maintain or increase their firm value, and to avoid the uncertainty created by missing the forecast. Brown and Caylor (2005) propose that since negative earnings surprises are now less frequent the market tends to negatively overreact when firms miss quarterly analyst estimates. Additionally, Skinner and Sloan (2002) suggest that management is fully aware that if they miss the analysts' earnings forecast by as much as a penny, the punitive effects of a myopic market focused on quarterly EPS growth can have a devastating effect on the firm's stock price.

In a study of the accounting consequences associated with ASRs, Dickinson et al. (2012) suggest that the current FASB accounting treatment of ASRs makes them especially suitable as instruments to manage EPS.[27] They report that under current generally accepted accounting principles (GAAP), the forward contract associated with an ASR is treated as an equity instrument tied to the company's stock. Since the company has the option to settle the forward contract by issuing additional shares, it is not required to adjust the forward contract to its fair market value (mark-to-market) over the contract period. Thus, while the unrecorded gains and losses resulting from changes in the value of the firm's shares represent potential off-balance sheet assets or liabilities, they will be recorded as adjustments to shareholder's equity upon realization at settlement, entirely bypassing the income statement. As an ASR enables the firm to immediately reduce a significant amount of its outstanding equity, and thus reduce the average number of shares outstanding used to calculate the reported EPS, we suggest that firms may initiate an ASR as part of their current repurchase authorizations to meet or exceed analyst EPS forecast when, otherwise, they would have missed the forecasted EPS without the ASR. We form the following testable hypotheses:

H1 (a): *The likelihood that a firm initiates an accelerated share repurchase is increasing in the negative pre-repurchase earnings surprise or when the repurchase is accretive.*

H1 (b): *The likelihood that a firm initiates an accelerated share repurchase should be positively related to the ASR's ability to enable the firm to meet its analyst quarterly EPS forecast.*

2.3 Free Cash Flow Hypothesis

Jensen (1986) proposes that a firm faced with fewer growth opportunities should pay out excess cash in the form of dividends or share repurchases to avoid the agency cost of overinvestment. Grullon, Michaely and Swaminathan (2002) find that maturing firms experience a significant decline in risk as their investment opportunity set declines, thus, shifting their valuation from risky growth options to fixed assets. As such, they suggest that these firms should pay out excess cash when faced with reduced investment sets. Grullon and Michaely (2004) find that, during the three-year period following an OMR announcement, firms exhibit deteriorating operating performance as well as a reduction in capital expenditure, research and development, and the firm's cost of capital. They argue that the market's positive abnormal response to an OMR announcement is not due to signaling undervaluation or positive outlook, but to management's commitment to return excess cash to shareholders to minimize the agency cost of overinvestment. Lie (2005) also finds that operating performance decreases for firms following the announcement of an OMR; however, he reports that firms that actually repurchase shares during the same fiscal quarter as the OMR

[27] Financial Accounting Standards Board's (FASB) Emerging Issues Task Force (EITF) Issue 99-7 "*Accounting for an Accelerated Share Repurchase*" states that an ASR must be accounted for as two separate transactions: (1) a treasury stock acquisition and (2) a forward contract that allows settlement in either cash or firm shares.

announcement exhibit increases in operating performance *relative* to non-repurchasing firms. If the motivation for the use of an ASR stems from management's desire to signal the market of their commitment to return excess cash, we expect to find that ASR firms have fewer growth opportunities and higher free cash flow relative to non-ASR firms. The following hypothesis is developed to test if the free cash flow theory is an underlying motive for an ASR:

H2: *Firms that announce an ASR should have fewer growth opportunities and/or a higher level of free cash flow than those that only announce an open market repurchase authorization.*

2.4 Signaling Undervaluation Hypothesis

The other major difference between ASR and OMR is the firm's commitment to repurchase its shares. OMR announcements are not legally binding and, thus, do not obligate the firm to repurchase any of the targeted shares. Thus, OMRs provide the firm with the flexibility to time its repurchases to take advantage of the changes in stock price, cash flows, or investment opportunities. This inherent flexibility is one of the primary reasons OMRs have gained such popularity among various repurchase methods (see e.g., Stephens and Weisbach, 1998; Fenn and Liang, 2001; Jagannathan, Stephens and Weisbach, 2000; and Lie, 2005). In sharp contrast, entering an ASR legally obligates the firm to immediately repurchase the stated number of shares in the contract. Therefore, a firm that initiates an ASR loses the flexibility to time a repurchase. As such, an ASR represents a more credible commitment to repurchase than an OMR authorization (see e.g., Bargeron et al., 2011; and Farre-Mensa et al., 2014).

One of the primary motivations for share repurchases in the literature is to signal undervaluation, in which management with private information about the firm's prospects sends a costly signal to the market regarding the undervaluation of its shares (e.g., Bhattacharya, 1979; Miller and Rock, 1985; Vermaelen, 1981; Ikenberry, Lakonishok, and Vermaelen, 1995; and Dittmar, 2000). Brav et al. (2005) report that CFOs indicate undervaluation as the primary motivation for a firm to repurchase its shares (see also Boudry et al., 2013; and Dittmar, 2000). In the ASR literature, Bargeron et al. (2011), Chemmanur et al. (2010) and Michel et al. (2010) suggest that the credibility of the firm's commitment to immediately repurchase its shares through an ASR should send a stronger signal to the market than can be accomplished using an OMR announcement. OMRs have long been criticized as lacking credibility as they represent a weak signal due to the firm's ability to postpone or refrain from repurchasing shares (see e.g., Vermaelen, 1981; and Comment and Jarrell, 1991). Chan et al. (2010) further suggest that OMRs are viewed as mere authorizations due to the inherent flexibility to time or to abstain from repurchases. If a firm initiates an ASR to increase the strength of its signal of undervaluation to the market, we would expect to see higher, positive cumulative abnormal returns (CARs) surrounding ASR announcements relative to those of an OMR. Additionally, we should expect to see more favorable post-repurchase operating performance for

ASR firms relative to non-ASR (OMR-only) firms due to management's positive inside information about future cash flows. We form the following hypotheses to test if signaling is a motive for initiating an ASR:

H3 (a): *Cumulative abnormal returns (CARs) surrounding an ASR announcement should be significantly positive and higher than those surrounding an OMR authorization.*

H3 (b): *Post-repurchase operating performance of an ASR firm should improve and be better than that of an OMR only firm.*

3. Data description

3.1 ASR Sample

We hand-collect a sample of 716 ASR contracts initiated by 346 distinct firms over the period from 2004 to 2015. This period of study is selected for several reasons. First, as reported in Bargeron et al. (2011), there is negligible evidence of the use of ASRs prior to 2004. Second, the extant literature on accelerated share repurchases examine a subset of the period between 2004 and 2008. Lastly, as Banyi et al. (2008) report, data on share repurchases prior to 2004 is subject to measurement or estimation errors due to the proxy used for repurchases and the lack of regulation regarding the disclosure of repurchases.[28] We begin the data collection process by conducting keyword searches for ASRs using the ABI/Inform database from 2004 to 2011 and the SEC's Edgar database for the period from 2012 to 2015. We follow Akyol et al. (2014) and use keywords including "accelerated share repurchase(s)," "accelerated stock repurchase(s)," "accelerated stock buyback(s)," "accelerated share buyback(s)," "accelerated repurchase(s)," and "accelerated buyback(s)." In addition, we search the Lexis-Nexis database and Google.com for additional mentions of ASRs. The initial search process results in 11,364 matches. We individually examine each match to determine if it is an accelerated share repurchase contract. The key features of an ASR can be identified by the contract initiation, the immediate delivery of shares by the intermediary, and the entry into a long forward position by the firm. Next, we use the Edgar database to search for SEC filings (8-K, 10-Q, 10-K, and others) to confirm the details of each search result. From these filings, we construct the largest database of accelerated share repurchases contracts in the literature to date.[29]

[28] Banyi et al. (2008) find that, even after the 2003 change in the SEC's repurchase disclosure requirements, the Compustat measure of share repurchases (Compustat annual data item #115 minus changes in the value of preferred stock), either overstates or understates actual repurchases by at least 10% in 34% (48%) of the quarterly (annual) Compustat purchases of common stock observations. They also find that the SDC (Securities Database Corporation) capture rate for repurchase announcements during the year 2004 was only 53.1% (119 of 224) suggesting that the SDC is far from accurate in its reporting of repurchase announcements.

[29] As previously mentioned, there is some confusion in the early literature as to what constitutes an actual accelerated share repurchase contract. Firms often refer to "accelerating" their share repurchases when in fact they are simply increasing the rate of their open market repurchases.

Table 1 presents the summary statistics of the sample of 716 ASR contracts. In Panel A, we see that ASRs experienced rapid growth before the financial crisis reaching a total dollar amount of $85.91 billion (9.12% of total reported Compustat/CRSP repurchases) in 2007 before declining to $606 million in 2009. After the crisis, ASR usage quickly recovered and steadily increased in dollar amount and percentage. Panel B presents the characteristics of ASR announcements by year. Of the 716 ASRs, 530 (74.02%) were publically announced through either a press release or an 8-K filing.[30] There appears to be a trend in the latter half of the sample period where firms choose not to publically announce their ASRs. Of those publicly announced, 149 (20.81%) were simultaneously announced with either a new or existing repurchase authorization. One of the most salient features in the data is the fact that 664 ASRs, representing 92.74% of the sample, are a part of the firm's new or preexisting repurchase authorization. Only 52 ASRs (7.26%) are stand-alone programs, either solely authorized or authorized in addition to, but independent of, the firm's existing repurchase authorization. Our sample is consistent with the proposition of Bargeron et al. (2011) and Michel et al. (2010) that ASRs are primarily initiated under the firm's overall repurchase authorization. This observation is important in how we disentangle the motivations of the firm's inclusion of an ASR apart from OMRs.

Panel A of Table 2 presents the summary statistics of the ASR programs. On average, ASRs are extremely large with a mean (median) dollar amount of $598.20 ($254.36) million. The mean (median) percent of outstanding equity sought in an ASR is 4.18% (3.01%), while ASRs represent a mean (median) percentage of the most recent repurchase authorization of 42.77% (33.33%). These amounts (percentages) are comparable to those found in prior studies.[31] The mean (median) total number of shares purchased under an ASR contract is 11.58 (5.45) million with the mean (median) number of shares delivered to the firm during the quarter of contract initiation equal to 10.49 (4.80) million shares. Thus, firms on average (median) receive approximately 90.64% (88.06%) of the total number of shares acquired under an ASR in the first quarter of the program. Additionally, for those firms that conduct ASRs while concurrently repurchasing their shares in the open market, the shares repurchased via the ASR represent an average of 76.6% of all shares purchased during the same quarter. As such, an ASR clearly enables a firm to quickly repurchase a significant percentage of its outstanding equity. Panel B of Table 2 presents the distribution of ASRs by the Fama/French 12 industry categories. All twelve Fama/French industries are represented by ASRs with the top three comprised of finance (20.95%), business equipment (16.20%) and wholesale/retail (15.08%). ASRs are utilized the least in the consumer durables (1.82%) and energy (1.54%).

[30] The remaining 186 (25.98%) ASR programs were discovered either in subsequent quarterly 10-Qs or annual 10-K filings with the SEC.

[31] Bargeron et al. (2011) find that among 256 ASRs, the mean (median) equity sought is 5.27% (3.48%) while the mean (median) percentage of the "announced program" is 58.03% (50.70%). In a study of 127 ASRs, Michel and Oded (2010) find a mean (median) percentage of equity sought of 5.3% (3.6%) and report that the mean ASR percentage of an ongoing OMR program is 50.0%.

3.2 Share Repurchase Sample and Descriptive Statistics

To put together our sample of share purchases to test for earnings management we collect data from the following sources: quarterly share repurchases and firm financial data from the merged Compustat/CRSP database, analyst's quarterly earnings forecast data from the Thomson Reuters' Institutional Brokers' Estimate System (IBES) database, stock prices (returns) from CRSP, data on executive stock options from Execucomp, and repurchase authorization announcements, and takeover rumors and asset sales from SDC's Mergers and Acquisition database. We start by collecting all quarterly data from the merged Compustat/CRSP database for the years 2004 to 2015 yielding 265,891 firm-quarter observations.[32] Next, we collect data on analyst quarterly consensus EPS forecasts and reported EPS from IBES. Following Hribar et al. (2006), we select the earliest possible consensus estimate of EPS to give management adequate time to react to a potential earnings miss. Matching the IBES data with the quarterly repurchase sample results in a sample of 163,869 firm-quarters. We further precondition on firms with positive share repurchases in a given quarter by requiring CSHOPQ (*Common Shares Outstanding Purchased-Quarterly* reported in Compustat) to be positive.[33] Following Hribar et al. (2006), we delete those firm-quarter repurchases under $10,000; however, we choose not limit the maximum amount.[34] To mitigate the possible skewness associated with the small market-cap effect, we also eliminate firm-quarter observations with an end-of-quarter closing share price of $3.00 or less. Next, we turn our attention to our hand-collected sample of ASRs. We first consolidate all ASR contracts initiated by the same firm in each quarter, resulting in a sample of 692 firm-quarter ASRs. We then match each firm-quarter ASR to the Compustat/CRSP/IBES record based on the quarter in which a firm receives its initial delivery of shares, resulting in 621 ASR firm-quarter observations. The above steps result in the final sample of 52,443 firm-quarter repurchase observations of which 621 are associated with ASRs.

In addition to many of the explanatory variables used in Bargeron et al. (2011), we include variables to control for operating return on assets (OROA) (see e.g. Grullon and Michaely, 2004; Lie, 2005), sales growth over the most recent three years (Grullon, Michaely, and Swaminathan, 2002), dividend yield (Grullon and Michaely, 2002), financial constraints (e.g., Chen and Wang, 2012; Farrell, Unlu, and Yu, 2014), executive options outstanding (Kahle, 2002), and total employee options outstanding (Bens et al.,

[32] Following Grullon and Michaely (2004), we include financials and utilities as they comprise over 25.4% of our sample of ASRs. We also conduct analysis without financials and utilities and find the results are very similar. While not included to conserve space, results are available from the authors upon request.

[33] We differ from Hribar et al. (2006) who estimate *shares repurchased* in the quarter as: $CSHO_{BegQtr} + shares\ issued - CSHO_{EndQtr}$. They estimate *shares issued* as the ". . . *issuance of stock* (#84) minus any increase in *preferred stock* (item #55) or *redeemable preferred stock* (item #77), divided by average price . . ." . (pg. 9). $CSHO$ represents *common shares outstanding*.

[34] Hribar et al. (2006) deletes all firm-quarter observations in which total repurchases exceed 20% as possible tender offers. As accelerated share repurchase (ASR) contracts are often very large and may be conducted for reasons similar to tender offers, we choose not to limit the size of the repurchase during any quarterly observation (see e.g. Akyol, Kim, and Shekhar, 2014).

2003), as these variables have been shown to influence the decision to repurchase shares. Appendix A describes in detail the construction of all variables.

Table 3 presents univariate statistics of our sample of firm-quarters observations. Consistent with previous studies, we find that ASR firms are significantly larger, both economically and statistically, than non-ASR firms. The average (median) ASR firm has total assets of $33.89 ($8.12) billion and a market capitalization of $18.95 ($7.37) billion. The median ASR firm is approximately 3.7 times larger than non-ASR firms based on both size proxies. ASR and non-ASR firms are similarly capitalized with debt representing 20% of assets. To examine the free cash flow explanation, we include measures of excess cash (cash to assets and free cash flow), operating performance (operating ROA), and growth (market to book ratio and sales growth). Similar to Bargeron et al. (2011), ASR firms have significantly less cash than do non-ASR firms on average; however, the median difference is not significant. Unlike Bargeron et al., we find that ASR firms have significantly higher mean (median) free cash flow, lending support for the notion that firms initiate an ASR to distribute excess cash (e.g. Grullon and Michaely, 2004). Grullon and Michaely (2004) suggest that maturing firms, faced with a reduced investment opportunity set, repurchase shares to avoid the agency cost of over-investment (Jensen, 1986). As such, a firm may initiate an ASR to return large amounts of excess cash more quickly than allowable through an OMR to signal the management's commitment not to overinvest in negative net present value projects. Thus, we expect less favorable operating performance in ASR firms relative to OMR firms. We use operating return on assets (OROA) as a measure of operating performance. We find that both the mean and median OROA is significantly higher for ASR firms. Using sales growth to measure firm's growth opportunities, we find that the 3-year sales growth rate for ASR firms is significantly lower than for non-ASR firms. However, the difference in the market-to-book ratio between ASR and non-ASR firms is insignificant.

We control for the firm's prior stock performance by calculating the cumulative abnormal return (CAR) for each firm over the period from 44 days to 4 days prior to the beginning of the current quarter.[35] If signaling undervaluation is the motive to include an ASR, we would expect to find relatively lower prior CARs for ASR firms versus non-ASR firms. In contrast to Bargeron et al. (2011), we find that neither the mean nor median difference in prior CARs between ASR and non-ASR firms is statistically different.[36] We

[35] As our focus for earnings management is on the decision to conduct an ASR in the current quarter, we use the last day of the prior quarter (lagged actual period end date) as our relevant date for the calculation of abnormal stock run-up prior to the current quarter.

[36] We find approximately 26% of the ASRs in our sample (186 out of 716) are not publically announced and are only referenced in subsequent public filings (10-Qs, 10-Ks) for the quarter (or fiscal year). In contrast, Bargeron et al. (2011) use the "filing date" of the 10-Q or 10-K as the "public announcement date" in 36 such cases (out of 256 ASRs) representing 14.06% of their sample. In many of these cases, it is highly probable that they are measuring 'post' cumulative abnormal returns, as well as other stock related metrics, well after the choice to include an ASR has been determined, as well as after the ASR has already been initiated. However, they report that their findings are robust to the exclusion of these 36 observations.

measure prior stock price volatility as the standard deviation of returns over the period from 255 days to 46 days before the beginning of the current quarter. Mean (median) pre-repurchase volatility is significantly lower for ASR firms, which is consistent with Bargeron et al. Next, we consider liquidity because larger repurchases have been found to be associated with a more liquid market for the repurchasing firm's shares (Barclay and Smith, 1988). We use the natural logarithm of Amihud (2002)'s illiquidity measure and compute the average illiquidity of each firm over the period from 255 days to 46 days prior to the beginning of the current quarter. Since the Amihud measure represents illiquidity, we expect our sample of repurchasing firms to be inversely related. We find that all repurchasing firms are negatively related to the Amihud illiquidity measure. However, the mean (median) liquidity is 28.86% (23.18%) higher for ASR firm than for non-ASR firms, with both the mean and median differences being highly significant.

We adopt the measure of leverage deficit as constructed in Uysal (2011) to control for the firm's use of repurchases to move towards its target leverage (Hovakimian, Opler, and Titman, 2001). Leverage deficit is defined as the difference between a firm's actual and target debt ratios. A positive (negative) leverage deficit indicates that the firm is over (under) leveraged. ASR and non-ASR firms are slightly below their target debt ratios, with no significant mean or median difference between the two. Also, recent studies suggest that the likelihood of a share repurchase is negatively related to financial constraints (see e.g., Chen and Wang, 2012; Farrell et al., 2014). Following Farrell et al. (2014), we use the Hadlock and Pierce (2010) index (HP-index) as a measure of financial constraints. The smallest HP-index value (least financially constrained) is negative 4.6369. Neither ASR firms nor non-ASR firms appear to be financially constrained, which is to be expected as these firms have the financial slack to conduct share repurchases. More importantly, we find that ASR firms are significantly less financially constrained than non-ASR firms. Finally, we find significant differences in dividend yield, both exercisable executive and exercisable total employee options outstanding, as well as rumored (attempted) takeovers between the two groups.

From the above discussion, we present a picture of the characteristics of a firm that chooses to employ an ASR as a part of (or independent of) its repurchase authorization compared with those of a firm that use OMR only. While both groups have similar levels of cash and leverage, ASR firms are much larger and less financially constrained than non-ASR firms. In addition, ASR firms have higher OROA and free cash flow but slower sales growth than non-ASR firms. ASR firms do not appear to be more undervalued relative to non-ASR firms as we find no significant difference in market-to-book ratios or prior stock performance between the two groups. Furthermore, shares of ASR firms are more liquid and exhibit lower pre-repurchase volatility than those of non-ASR firms. As we are fully aware of the caveat of interpreting univariate results, we control for these variables in a multivariate logit framework below.

4. Empirical Analysis of the Earnings Management and Free Cash Flow Hypotheses

4.1 Variables for Earnings Management

To test the hypothesis that firms include ASRs to manage reported EPS, we follow the methodology of Hribar et al. (2006) to determine pre-repurchase estimates of EPS. In particular, Hribar et al. use Compustat quarterly data over the period from 1988 to 2001 to investigate the frequency of accretive stock repurchases and whether these repurchases are used to meet or exceed quarterly analyst consensus forecast. They examine the impact of stock repurchases on reported earnings by constructing two estimates of "as-if" pre-repurchase EPS, one which considers the denominator effect of share repurchases (ASIF_EPS1) and the other estimate which incorporates the numerator effect (ASIF_EPS2). The numerator effect, "C_t", represents the forgone after-tax interest income on cash (or interest expense if financed) used to repurchase shares. Both Hribar et al. and Bens et al. (2003) argue that the opportunity cost (k) of funds that are used for share repurchases must be less than the firm's earnings-to-price ratio ($k < EPS/P$) at the time of repurchase for the repurchase to be accretive to reported EPS.[37]

We construct the two ASIF pre-repurchase EPS measures for our sample of 52,443 firm-quarter observations. As the IBES consensus estimates contain both basic and diluted forecasts of EPS, we first calculate a simple Compustat based dilution factor to ensure that our measures of pre-repurchase EPS are comparable to the values reported in IBES. We adjust our estimates of pre-repurchase EPS using the dilution factor if the IBES consensus estimate is reported on a diluted basis as indicated by the variable IB-PDI.[38] We then construct the first pre-repurchase EPS estimate ($ASIF1$) reflecting the denominator effect of the repurchase as

$$ASIF1 = IBQ_t/(CSHOQ_{t-1} + 0.5 * CSHISQ_t) \quad (1)$$

where IBQ_t is Compustat *Income Before Extraordinary Items* available to common in the current quarter, $CSHOQ_{t-1}$ represents the common shares outstanding at the beginning of the quarter and $CSHISQ_t$ represents the shares issued during the quarter.[39] As in Hribar et al., we assume new shares are issued uniformly across the quarter and thus multiply $CSHISQ_t$ by a weighting factor of 0.5. Our calculation of $ASIF1$ EPS deviates slightly from Hribar et al. in our choice of income measure used to calculate pre-

[37] This condition is both necessary and sufficient for the share repurchase to be accretive, i.e. to increase reported EPS by at least $0.01. See e.g., Hribar et al. (2006) for a detailed mathematical derivation (pg. 8).

[27] In our sample, 35.6% (18,667 out of 52,443 matched firm-quarter observations) have IB-PDI indicators equal to "D" (diluted), while 33,773 records (64.4%) have missing values for the IB_PDI indicator variable.

[39] $CSHISQ_t$ is calculated as $CSHOQ_t - CSHOQ_{t-1} + CSHOPQ_t$ where $CSHOQ$ represents common shares outstanding at the end of the fiscal quarter, $CSHOQ_{t-1}$ represents the common shares outstanding at the beginning of the quarter, and $CSHOPQ_t$ represents common shares repurchased during the quarter.

repurchase EPS.[40] For the second ASIF pre-repurchase measure of EPS ($ASIF2$), we estimate the numerator effect (C_t) as the total dollar amount of all repurchases during the quarter [41] multiplied by the average 3-month Treasury Bill rate if the repurchases were financed with excess cash.[42] If the total repurchase dollar amount exceeds excess cash, then we use the firm's average cost of debt (k_{debt}) to calculate the after-tax interest expense associated with the repurchase.[43] The second pre-repurchase EPS estimate ($ASIF2$) is calculated as follows:

$$ASIF2 = (IBQ_t + C_t)/(CSHOQ_{t-1} + 0.5 * CSHISQ_t) \quad (2)$$

Both measures of ASIF pre-repurchase EPS allow us to estimate the effects of share repurchases on the reported EPS. Using our ASIF EPS estimates, we next construct two sets of variables to test the earnings management hypotheses: H1 (a) and H1 (b). For brevity, we only discuss the construction of the ASIF2 variables as the construction of the ASIF1 variables is identical. Our primary variable of interest is ASIF2_SURPRISE which measures the difference between the ASIF2 pre-repurchase EPS estimate and the IBES consensus EPS forecast ($ASIF2\_SUPRISE = ASIF2 - IB\_MEANEST$), which represents the pre-repurchase earnings surprise. If the firm would have missed the analyst consensus EPS forecast without the repurchase, then this measure is negative and represents the magnitude of the pre-repurchase earnings miss. We expect that for a firm that wishes to manage its reported EPS through a share repurchase, the likelihood for initiating an ASR should be negatively related to ASIF2_SURPRISE and increase in the absolute value of the pre-repurchase earnings miss.

We next construct several variables to measure the actual effect of the share repurchase. Hribar et al. (2006) find that firms that would have missed consensus forecasted EPS by one or two cents have a disproportionate amount of accretive share repurchases during the same quarter. Additionally, Marquardt et al. (2011) find that firms are more likely to conduct an ASR when the repurchase is accretive to EPS. Therefore, we create the variable ASIF2_DIFF which measures the difference between the actual EPS and

[40] Hribar et al. use Compustat item NI (Net Income) to calculate their "ASIF" measures of pre-repurchase EPS. In untabulated results, we find that the use of Compustat items IBQ (Income Before Extraordinary Items-Quarterly) more closely reflects the actual Compustat reported EPS in item EPSFXQ (Earnings Per Share (diluted) – Excluding Extraordinary Items).

[41] The total dollar amount of all repurchases in the quarter is calculated as ($CSHOPQ_t * PRCRAQ_t$) where $CSHOPQ_t$ represents all common shares repurchased during the fiscal quarter and $PRCRAQ_t$ represents the average repurchase price paid per share.

[42] Excess cash is calculated as the amount of cash and cash equivalent assets (CHEQ) in excess of 6% of total quarterly assets (ATQ) for all retail firms (i.e. those firms with 2-digit SIC codes in the following group: 52, 53, 54, 55, 56, 57, 58, and 59), and otherwise, in excess of 2% of total quarterly assets (ATQ) for all other firms. All values are as of the beginning of the firm-quarter in which the share repurchase takes place.

[43] Our proxy for the firm's cost of debt (k_{debt}) is calculated as $XINT/(LT - AP - TXP - XACC)$ where $XINT$ represents *Interest and Related Expense-Total*, LT represents *Total Liabilities*, AP represents *Accounts Payable*, TXP represents *Income Taxes-Payable*, and $XACC$ represents *Accrued Expenses*. All values are from Compustat and are as of the prior fiscal year-end. This proxy represents the firm's average (after-tax) cost of debt capital on all borrowed funds in excess of thirty days. Corporate tax rate is assumed to be 35%.

the estimated ASIF2 pre-repurchase EPS. As the actual EPS already includes the effects of the share repurchase, by subtracting ASIF2 pre-repurchase EPS, we can calculate the per-share dollar effect of the share repurchases. Using ASIF2_DIFF, we determine if the share repurchase is accretive to earnings and/or if it enables the firm to meet or beat the consensus EPS forecast by constructing two indicator variables. The first indicator variable, ACCRETIVE_ASIF2, takes the value of one if the share repurchase is accretive, and zero otherwise. The second indicator variable, MBEPS_ASIF2, takes the value of one if the share repurchase enables the firm to meet or exceed its consensus EPS forecast, and zero otherwise.

Panel A of Table 4 presents univariate statistics characterizing the details of the firm-quarter share repurchase observations. As previously indicated, quarterly ASR repurchases are significantly larger in size than OMRs: The mean (median) quarterly dollar amount of ASRs is $589.99 ($251.49) million, which is 6.94 (33.82) times that of $85.09 ($7.42) million for the non-ASRs. In addition, an ASR firm acquires a mean (median) of 12.81 (5.96) million shares during the quarter, representing approximately 4.18% (3.01%) of all outstanding equity. On the other hand, a non-ASR firm acquires an average (median) of 2.12 (0.30) million shares or 1.07% (0.54%) of outstanding equity. For the earnings estimates, we observe that firms electing to use ASRs are more profitable than non-ASR firms. The mean (median) reported IBES actual EPS for ASR firms is approximately $0.77 ($0.69) per share compared to $0.53 ($0.39) for non-ASR firms, with the difference being significant. The consensus analyst estimates are generally accurate, confirming the findings of Hribar et al. (2006). It is interesting to note that the actual earnings surprise for ASR firms is positive and higher than that for the non-ASR firms, with the difference being highly significant. If we consider the two estimates of ASIF EPS without the repurchase, we find that for ASIF1 and ASIF2, the median earnings surprise would have been slightly negative with a pre-repurchase earnings miss of $0.03 per share for ASR firms and $0.01 per share for the other repurchasing firms, with the difference being highly significant. The mean differences between the two groups, however, are not significant. Further, we find that the median accretive effects (*Actual EPS – ASIF_EPS*) for all share repurchases offset the median pre-repurchase earnings miss. For both estimates of ASIF EPS, we find that the median ASR repurchases increased the reported EPS by $0.03. For non-ASR repurchases, we find a median ASIF2_DIFF of $0.01 per share, but ASIF1_DIFF (the denominator effect) has no incremental effect on the reported EPS. This is not surprising as the proportion of shares being acquired in a typical OMR is minimal with a median percentage of 0.54% of shares outstanding.[44]

Panels B and C of Table 4 present univariate statistics on accretive share repurchases and repurchases that meet or beat IBES consensus EPS forecasts, respectively. We focus on the results based

[44] Both Hribar et al. (2006) and Almeida, Fos and Kronlund (2016) find that for repurchases to be accretive to reported EPS, they need to exceed 1.0% of outstanding equity on average.

on the estimates of ASIF2 pre-repurchase EPS.[45] In Panel B, we find that 21,217 (40.46%) are accretive to quarterly EPS. More importantly, 56.03% of ASRs are accretive, which is significantly higher than 40.27% for non-ASRs. For accretive repurchases, we find that the actual earnings surprise and the pre-purchase earnings miss are similar across the ASR and non-ASR groups. However, the median ASIF2_DIFF of ASRs is significantly larger than that of the non-ASRs, with the difference of $0.01 significant at the 5% level. In Panel C, we observe that 25.54% of the quarterly repurchases enable a firm to meet or beat its analyst earnings forecast. Interestingly, 29.79% of ASRs result in the firm's ability to meet or beat its earnings forecast, which is higher than 25.18% for non-ASRs. For the subset consisting of repurchase firms that meet or beat their EPS forecasts, we highlight that the median ASIF2 pre-repurchase earnings miss for ASRs is $0.09, which is significantly larger than $0.05 for non-ASR firms. Also, the median accretive effect per share of $0.14 for ASRs is greater than $0.09 for non-ASRs, with the difference being significant at the 1% level.[46] These results provide some preliminary support that earnings management may be a motive for firms to initiate an ASR relative to an OMR. In the next section, we extend our investigation to a multivariate framework to further explore this hypothesis.

4.2 Multivariate Regression Results

In this section, we examine the earnings management and free cash flow hypotheses using multivariate logit regressions. To identify potential multicollinearity, we first examine the correlation between the earnings management and control variables. As shown in Table 5, firm size (proxied by the natural log of total assets) is negatively correlated with our measure of Amihud illiquidity (-0.73). This is to be expected as larger firms tend to have more liquid markets for their shares. We also see that firm size is negatively correlated with the HP-Index (-0.58), while Amihud illiquidity is positively correlated with the HP-Index (0.52). When all three variables are included as explanatory variables, the sign on the coefficient of firm size is reversed and the significance of the HP-Index is subsumed by firm size and Amihud illiquidity. This suggests that Amihud illiquidity and the HP-Index may both proxy for firm size. Therefore, in a subset of our regressions, we exclude firm size from the model. We also find that Free Cash Flow and Operating Return on Assets (OROA) are positively correlated (0.75). As such, we include only one of these two (instead of both) variables in each regression. Lastly, the correlation between Total Employee Options and Executive Options (0.49) is moderately high. As Executive Options is a subset of Total Employee Options, we would expect these variables to be correlated. To address this issue, we choose to include only Total Employee Options in our regressions.

[45] While not reported, the results obtained from using the ASIF1 estimates are similar and are available upon request from the authors.

[46] While 25.5% of our sample firms meet or beat their consensus analyst EPS forecasts as a direct result of share repurchases, we do not suggest any form of malfeasance on the part of management. However, we do suggest the semblance of earnings management exists based on the results of our univariate analysis.

Table 6 presents coefficient estimates of the explanatory variables as well as ρ-values based on robust standard errors clustered at the firm level. The dependent variable, ASR, is a dummy variable that takes a value of one if an ASR is initiated in the given quarter, and zero otherwise. We control for firm-level variables in Models 1 through 4, while we include additional factors suggested by prior literature to be related to the motives of share repurchase in Models 5 through 8. Industry and year fixed effects are included in all models. We first use the ASIF2 pre-repurchase variables to test the earnings management explanation.[47] As previously discussed, if management's motivation to initiate an ASR is to meet or exceed the analyst EPS forecast, we hypothesize that the likelihood of conducting an ASR should be inversely related to the pre-repurchase earnings surprise (ASIF2_Surprise). Interestingly, in Models 1 and 2, we find that the coefficient on ASIF2_Surprise is positive and significant, indicating the likelihood that a firm chooses to include an ASR increases in the pre-repurchase *positive* earnings surprise. In other words, a firm is more likely to initiate an ASR if it would have met or exceeded its forecast EPS *without* a share repurchase. Next, we find the coefficient on Accretive_ASIF2 is positive and highly significant in Models 5 and 6. This result is consistent with our univariate result that almost 60% of ASR are accretive and the finding of Marquardt et al. (2011) that firms are more likely to include an ASR if it is accretive to EPS. When we include both ASIF2_Surprise and Accretive_ASIF2 in Models 4 and 8, the coefficients on ASIF2_Surprise and Accretive_ASIF2 remain positive and highly significant. Our third variable, MBEPS_ASIF2, indicates whether share repurchase results in the firm meeting or exceeding its forecasted EPS. In Models 3 and 7, we find that the coefficient of MBEPS_ASIF2 is positive but insignificant. Our findings suggest that a firm is more likely to use ASR if it has *higher* than expected earnings or if the repurchase is accretive. These implications are consistent with prior findings of repurchase activities. For example, Hribar et al. (2006) report that a discontinuity of repurchase activity exists around a pre-repurchase earnings surprise of zero and a disproportionate amount of share repurchases found for firms that would have missed earnings by only one or two cents per share. To sum up, we find that one of the main motives of ASR is the accretive nature of the repurchase, providing some evidence for the earnings management hypothesis. On the other hand, ASRs seems to be preferred by firms with a positive pre-repurchase earnings surprise. This indicates that there are other motives for firms to consider ASRs besides managing earnings.

For the agency cost hypothesis, we find solid support that firms may be using ASRs to disgorge excess cash. In particular, we find that cash and free cash flow are positively related to the likelihood of an ASR in six of the eight models. Additionally, firms are more likely to use an ASR when their operating return on assets (OROA) is more favorable, suggesting that firms generating higher operating income are

[47] Untabulated results for the ASIF1 estimates are similar and available upon request.

more likely to disgorge income through an ASR. As expected, larger and more matured firms faced with a declining investment opportunity set (reflected in lower market-to-book ratios) may choose to return excess cash to shareholders using an ASR to reduce the agency cost of overinvestment (Grullon and Michaely, 2002, 2004). For control variables, we generally find results consistent with prior literature. The coefficient on firm size is positive and highly significant, supporting the idea that larger firms are more likely to conduct an ASR relative to smaller firms. In addition, we confirm the findings in Bargeron et al. (2011) that the market-to-book is negatively associated with the likelihood of initiating an ASR. Prior stock return volatility is negatively related to the likelihood of an ASR, indicating that firms are more likely to consider an ASR if the market for their shares has been relatively stable. As an alternative proxy for firm size, we find a significant and negative coefficient on the Amihud illiquidity measure, indicating that larger firms and/or firms with more liquid stocks are more likely to initiate an ASR. Furthermore, the coefficient on leverage deficit is negative, indicating that a firm is more likely to conduct an ASR if its market leverage is well below its target leverage (Uysal, 2011). Next, we rerun the logit regressions using a matched set of firms to discern differences in the motives between firms with very similar characteristics.

We follow the matching techniques similar to those adopted in the repurchasing literature (e.g., Babenko, Tserlukevich, and Vedrashko, 2012) by matching on SIC industry, size and market valuation.[48] Specifically, we start by selecting matching firms from our sample of 52,433 firm-quarters with a positive repurchase based on (1) the same 2-digit SIC industry code, (2) a book value of total assets between 80% and 120% of the ASR sample firm as of the prior fiscal year-end and (3) a market value of equity between 80% and 120% of the ASR sample firm as of prior fiscal year-end. We also require that the matching firm-quarter observations must occur within plus or minus one fiscal year of the ASR sample firm-quarter. The matching firm-quarter cannot have the same unique Compustat firm identifier and cannot have conducted an ASR within plus or minus one fiscal year of the current ASR firm-quarter observation. We select the matched firm with the lowest absolute deviation in total assets and market value of equity as compared to our sample ASR firm. Our matching procedure results in a matched sample of 1,242 firm-quarter observations.

Table 7 presents the results from the conditional logit regressions using our matched sample. In general, the results are consistent with those found in Table 6. In particular, we have similar findings for ASIF2_Surprise pre-repurchase variable, Accretive_ASIF2 and MBEPS_ASIF2. When we include both ASIF2_Surprise and Accretive_ASIF2 in model (4) and (8), the coefficients are highly significant. While

[48] We follow the standard matching methodology found in most of the repurchasing literature by matching on industry and size (as proxied by the book value of assets); however, while most studies also match on a proxy for growth such as Market-to-Book (M/B), our sample of Compustat data is missing the variables necessary to compute M/B for 5,417 (10.33%) firm-quarters in our original sample. We, therefore, use another market-based measure of the firm, the market value of equity, as our sample is only missing this variable for 236 (or 0.45%) observations.

the accretive nature of the repurchase is a deciding factor when considering the use of an ASR, the positive coefficient on ASIF2_Surprise confirms that there are motivations beyond earnings management for firms to consider ASR. Our matched pair analysis provides further support for the free cash flow hypothesis for the use of an ASR. In particular, the firm's level of cash is positively and significantly (1% to 5%) related to the likelihood of including an ASR, suggesting that as firms with higher levels of cash are more likely to initiate an ASR to return cash to shareholders. In addition, free cash flow continues to have a significant and positive impact on the use of ASR. Both findings indicate that disgorging excess cash may be a motive for firms to choose ASR. We find that the coefficient on operating return on assets (OROA) is positive and significant, suggesting that firms with more favorable operating performance are more likely to initiate an ASR. For growth measures, we find that the coefficient on 3-year sales growth is negative and now significant in the first four models and that on the market to book ratio is negative and significant in Models 5 through 8, supporting the notion that as growth slows down in these large firms, the propensity to payout cash increases. The results on the control variables are similar those in Table 6, except for the following notable differences. First, prior stock performance enters five of the eight models as negative and highly significant, suggesting that an ASR firm has lower prior returns than a non-ASR matched firm. Second, leverage deficit is no longer a significant factor for the inclusion of an ASR.

4.3 Robustness Checks

As previously discussed, the accretive nature of share repurchases depends both on the relationship between the firm's earnings-to-price ratio (E/P) and the opportunity cost of the share repurchase (k) (i.e., $E/P > k$ for the repurchase to be accretive at the time of the repurchase), and the timing of the repurchase during the quarter. Repurchases made earlier in the quarter carry more weight, q, in the calculation of the firm's weighted average shares outstanding during the quarter used in reported EPS, and thus will have a more accretive effect on EPS than those shares purchased later in the quarter. Michel et al. (2010) report in their study of 127 ASRs over the period from 2004 to 2007 that the majority of ASRs, based on announcement date, are initiated in the second and third month of the quarter, 45.7% and 36.2%, respectively. Thus, it is possible for firms to initiate an ASR in the current quarter in an effort to manage the reported EPS in the *subsequent* quarter. As previously indicated, the IBES summary database includes mean consensus analyst EPS forecast for up to eight future quarters. So, management, having private information about the next quarter (t+1) pre-repurchase earnings shortfall, could initiate an ASR in the current quarter (t) to obtain the full accretive effect of an ASR at the beginning of the next quarter. Thus, they can boost quarter (t+1) EPS to meet or beat the forward-looking quarter (t+1) EPS forecast. We repeat our analysis of earnings management by calculating the ASIF2 pre-repurchase estimates of EPS for quarter (t+1). From these, we compute the three earnings management variables of interest: ASIF2_Surprise (t+1), Accretive_ASIF2 (t+1), and MBEPS_ASIF2 (t+1) and run the same set of logit regressions represented in

Table 6 using the quarter (t+1) variables. Untabulated results confirm that it is unlikely for firms to initiating ASRs in the current quarter (t) to meet or beat the quarter (t+1) EPS forecast. The coefficients on the quarter (t+1) earnings management variables are generally insignificant.[49]

As an additional robustness check, we exclude financial and utility firms as they are highly regulated. This results in a sample of 38,275 firm-quarter observations containing 459 ASR firm-quarter repurchases. We rerun the logit regression models shown in Table 6 and find that the results remain robust. In addition, we divide our sample into pre- and post-financial crisis periods by using 2009 as the separating year. We find that the results are similar across the two periods and conclude that the financial crisis does not result in a significant shift in the motives for the initiation of an ASR.[50]

4.4 Summary of Findings

Our finding suggest that a firm is more likely to initiate an ASR when the repurchase is accretive, providing support for the earnings management explanation. However, ASR firms tend to be those with a positive earnings surprise prior to the repurchase and the ability to meet or exceed EPS forecast may not be a main driver of the decision to initiate an ASR. This is not surprising given that ASR firms are larger and more mature firms than non-ASR firms. While these firms may be using ASRs to obtain a larger accretive effect in order to achieve an immediate and short-term bump in earnings, our results are most consistent with the agency theory of free cash flow. More specifically, we find that, relative to firms that only repurchase through the open market, firms that are likely to include an ASR are large firms with a higher level of cash, more free cash flow, and better operating performance. Additionally, compared to non-ASR firms, ASR firms appear to be maturing in their life-cycle as their sales growth and market to book ratio are lower, indicating that they are faced with reduced investment opportunity sets. Thus, ASR firms are likely to commit to return excess cash to shareholders through the use of ASRs. This description of an ASR firm is very similar to the maturing firms found in Grullon and Michaely (2004) that repurchase their shares in the open market in an effort to signal the market, not of the firm's positive outlook, but of management's commitment to return excess cash to shareholders to avoid the agency cost of overinvestment. In the next section, we extend the studies of Grullon and Michaely and Lie (2005) by examining the post-repurchase operating performance of repurchase firms to investigate whether signaling and/or free cash flow theories can explain managements' motive for the inclusion of an ASR.

5. Signaling Undervaluation versus Free Cash Flow Hypothesis

[49] We do find that the $Accretive\_ASIF2_{t+1}$ is significant and positive only in Model 7 when included with $ASIF2\_Surprise_{t+1}$; however, $ASIF2\_Surprise_{t+1}$ as well as $MBEPS\_Surprise_{t+1}$ never enter any model significantly.

[50] All results are available from the authors upon request.

As previously discussed, if management chooses to announce an ASR as part of its preexisting or current authorization to signal information to the market, an examination of both subsequent operating performance and the market's reaction to an ASR announcement can shed light on the information being conveyed. To do so, we extract from our ASR sample a subsample of ASRs in which firms publicly announce the repurchases. Of the 716 ASR contracts, 530 distinct ASR contracts (523 ASR programs) were publically announced through a press release or an 8-K filing with the SEC (or both). Of these 530 announced ASR contracts, 478 (90.2%) were announced as part of a pre-existing (or concurrently) announced repurchase authorization, while 52 (9.8%) are considered 'standalone' ASRs that are authorized independent of any of the firm's other repurchase authorizations. Next, we merge the announced ASRs with the repurchase announcements reported in the Securities Data Corporation (SDC) Platinum Mergers and Acquisition database. As Banyi et al. (2008) report, the SDC database gathers announcement data from multiple sources and, as such, contains duplicate announcement records. To address this issue, we eliminate subsequent repurchase announcements if they occur in the same month and year.[51] We also eliminate announcements coded as completed or withdrawn, and all other privately negotiated announcements.[52] As some firms announce multiple ASRs contracts within the same program/announcement, we combine multiple ASR contracts under the same announcement into one distinct program, thus, arriving at a final sample of 4,151 repurchase announcements consisting of 523 ASR program announcements and 3,628 OMR program announcements.

5.1 Market Reaction to Repurchase Announcements

We analyze the markets' response to the announcement of an accelerated share repurchase relative to an OMR using our combined sample of 4,151 repurchase announcements. Of these, CRSP returns data is only available to calculate abnormal returns for 522 ASRs and 2,986 open market repurchases. We use a standard event-methodology (Brown and Warner, 1985) to calculate abnormal returns with a parameter estimation period from 255 days to 46 days prior to the announcement date with a required minimum of 100 days of returns during the estimation period. All abnormal returns are calculated based on the market-model using the value-weighted return on all CRSP firms listed on the NYSE, AMEX, and NASDAQ. The proxy for the risk-free rate is one-month T-bill rate obtained from Ken French's website. Table 8 reports 3-day, as well as 5-day, cumulative abnormal returns (CARs). Prior studies report that 3-day CARs for ASRs are lower than those found in the literature for OMR announcements.[53] For example, Bargeron et al.

[51] Firms often conduct multiple ASRs under the same original (or augmented) repurchase authorization. Also, the SDC 'capture rate' of 63.10% in the current study is similar to the 53.1% reported in Banyi et al. (2008)

[52] While ASRs are privately negotiated repurchases, the SDC database often codes these as either "OMR" or "Private". As such, we eliminate private repurchases only after matching ASRs to ensure the highest capture rate possible.

[53] For example, Lie (2005) finds mean (median) 3-day CARs of 3.0% (1.9%) for OMR announcements while Grullon and Michaely (2004) find 2.7% (1.8%). Peyer and Vermaelen (2009) report a positive 3-day CAR of 2.39% surrounding the announcement of an OMR program over the period from 1991 to 2001.

(2011) find mean (median) 3-day CARs of 1.42% (0.95%) while Michel and Oded find mean 3-day (5-day) CARs of 1.26% (1.34%). In the current study, however, we find significant mean (median) 3-day CARs of 1.64% (1.40%) for ASRs versus 1.43% (1.17%) for open market authorizations, however the difference in mean or median between the two groups is not significant. When comparing the 5-day CARs [-2, +2], we find significant differences between ASRs and OMR authorizations. Mean (median) 5-day CARs for ASRs are 1.95% (1.53%) versus 1.37% (1.16%) for OMR announcements. This represents a positive mean (median) difference of 0.57% (0.41%).

Also, different from the findings of Bargeron et al. (2011), we find that the combined 3-day (5-day) CARs for ASRs that are announced *simultaneously* as part of a firm's new or augmented repurchase authorization are significantly larger than those of *subsequently* announced ASRs that are part of a preexisting authorization.[54] We find mean (median) 3-day CARs for simultaneously announced ASRs are 2.61% (2.80%) versus only 1.29% (1.13%) for subsequently announced ASRs, with differences significant at the 5% (1%) level. Also, the 3-day CARs are significantly higher for those firms that simultaneously announce an ASR versus those OMR-only firms that never include an ASR as part of their repurchase authorization, representing a mean (median) difference of 1.14% (1.61%). Since the combined information effects of the simultaneously announced repurchase authorization and the ASR contract are impounded in the cumulative abnormal returns, the market response to the ASR cannot be disentangled from the response to the repurchase authorization. However, the market responds more favorably to the firm's commitment to immediately repurchase its shares when an ASR is announced concurrently as part of a new or augmented repurchase authorization. Like Bargeron et al., we find that open market authorizations that include subsequent ASRs have significantly lower mean (median) 3-day CARs, 0.93% (0.79%), than those that never include an ASR as part of their repurchase programs, 1.46% (1.19%). As Bargeron et al. suggest, this may indicate that firms, whose initial repurchase authorization was received poorly by the market, include a subsequently announced ASR as means to strengthen the signal.

From the univariate results, we conclude that the announcement effects of an ASR are value-increasing. To explore the determinants driving the abnormal returns, we report, in Table 9, the OLS regressions of 3-day and 5-day cumulative abnormal returns (CARs) on the set of earnings management variables, free cash flow theory measures, and control variables used in the logit regressions in Table 6.[55] We control for the announcement type with a dummy variable, ANCDTYPE, which takes a value of 1 for

[54] Of the 472 (478) publically announced ASR programs (contracts), which are part of the firm's existing (or new) share repurchase authorization, we find that 98 are announced *simultaneously* as part of a new or augmented repurchase authorization, while 374 are announced as part of, but *subsequent* to, a prior announced outstanding (pre-existing) repurchase authorization.

[55] In Table 9 regressions, in contrast to Tables 6 & 7, we include all control variables concurrently because we find that the results are not significantly altered when excluding correlated variables as was the case in the logit regressions, however we only report the results for our variables of interest. Complete results are availabl e upon request.

the announcement of an ASR and 0 for the announcement an OMR, to gauge the market response to an ASR announcement. We also control for the percent of equity sought in the repurchase announcement as larger repurchase authorizations have been found to be associated with higher abnormal returns (Comment and Jarrell, 1991). The dependent variable in Models 1 through 3 is the 3-day CAR around the repurchase announcement date [-1, +1], while in Models 4 through 6, we use the 5-day CAR [-2, +2]. All variables are winsorized at the 1% level to mitigate the effect of outliers. Coefficients on the regressors are reported with their ρ-values in parentheses, which are based on the robust standard errors clustered by firm.

We find the coefficient on ANCDTYPE is both positive and highly significant in all models, confirming our univariate results that the market response is more favorable for an ASR than an OMR. Consistent with prior studies, abnormal returns are significantly increasing in the size of the announced program. Interestingly, we find that the short-term cumulative abnormal returns are significantly positively related to the pre-repurchase measure of earnings surprise. This finding suggests that the market responds more favorably to repurchase announcements made by firms that have a record of positive earnings and that have could meet or exceed analyst forecasts in the past without the use of repurchases. When combined with the positive response to an ASR announcement, we suggest that the market is rewarding those firms that are already operating profitably and are committing to pay out excess cash immediately through an ASR. Taken together, these findings suggest that ASR announcements lead to a more positive short-term market reaction than OMR announcements. In addition, the market responds more favorably to a purchase conducted by firms with strong operating performance at or prior to the announcement and/or more cash on hand. The ASR firms tend to be those with solid profitability but reduced investment opportunity sets, and the market responds favorably to these firms due to their commitment to distribute excess cash and avoid the agency cost of overinvestment. Overall, our results provide further support for the free cash flow explanation, but not the signaling hypothesis.

5.2 Post-Repurchase Operating Performance

In this section, we examine changes in post-repurchase operating performance for firms that announce an ASR during the quarter. As previously discussed, if management's motivation to initiate a costly ASR is to signal its positive outlook or undervaluation, we would expect the firm's future operating performance to increase *relative* to firms that repurchase through OMR transactions (see e.g., Comment and Jarrell, 1991; Dittmar, 2000; Bargeron, 2011). However, if management's motivation for initiating an ASR is its commitment to expediently return excess cash to shareholders to avoid the agency cost of overinvestment, we would expect operating performance to remain the same or decrease *relative* to the OMR firms (Grullon and Michaely, 2004). Following the methodology in Lie (2005),[56] we measure the

[56] See Gong, Louis, and Sun (2008), and Chen and Wang (2013) for additional examples of this procedure.

post-announcement operating performance over the eight quarters following a repurchase announcement using the performance-adjusted operating return on assets (OROA).[57] The performance-adjusted OROA is calculated using on a matched sample of firms based on similar operating performance in the four quarters prior to the repurchase announcement. As the purpose of our study is differentiate the ex-post motivations to include an ASR as part of an existing repurchase authorization in which the firm's decision to authorize repurchases has been made ex-ante, we match ASR firms with firms having open market repurchase authorizations announced in the same quarter.[58] Additionally, we require repurchases in which firms acquire at least 1% of the outstanding equity as Lie finds that relative improvements in operating performance are only found in firms that purchase a significant amount of their shares in the announcement quarter.

We match the sample of 4,151 ASR and OMR repurchase announcements with the original sample of 52,441 firm-quarter repurchases to arrive at a final sample of firms that announce and repurchase shares in the same quarter. While all 523 announced ASRs are matched to firm-quarter observations, only 312 make repurchases in excess of 1% of outstanding equity and have valid Compustat data on operating performance around the announcement. To find the match pairs for ASR firms, we matched on 2-digit SIC industry code, market-to-book value of assets between 80% and 120% of the ASR sample firm at prior fiscal year-end, and average operating performance (OROA) over the (4) quarters prior to the announcement quarter between 80% and 120% of the ASR sample firm. We choose the matching firm with the lowest absolute deviation of differences in operating performance using Lie's (2005) formula as

$$\left|\mathrm{OROA}_{\mathrm{Qtr\ 0,ASR\ firm}} - \mathrm{OROA}_{\mathrm{Qtr\ 0,Firm\ i}}\right| + \left|\mathrm{OROA}_{[-4\ Q\mathrm{trs,Qtr\ 0}],\mathrm{ASR\ firm}} - \mathrm{ORAO}_{[-4\ \mathrm{Qtrs,Qtr\ 0}],\mathrm{Firm\ i}}\right| \quad (3)$$

As in Lie, we disregard the second term if a firm lacks the data required to calculate the OROA in the prior four quarters ending with the announcement quarter. In untabulated results, we find that the pre-repurchase operating performance is very similar between the matched pairs of repurchasing firms. The mean (median) announcement quarter OROA is 4.50% (4.07%) for ASR firms and 4.49% (3.86%) for the OMR firms. Pre-announcement four-quarter mean (median) OROA is 4.53% (3.94%) for ASR sample and 4.46% (3.88%) for the OMR sample. The mean (median) differences of both measures are insignificant.

[57] As in prior studies, we follow the definition of return on assets (ROA) as operating income before depreciation (Compustat OIBDP) scaled by the book value of cash-adjusted assets at the beginning of the quarter. Cash-adjusted assets are derived by subtracting cash and cash equivalent assets (CHE) (if available) from total assets (AT).

[58] The customary practice in the post-repurchase literature is to match repurchasing firms with 'non-repurchasing' firms to understand the original motives for announcing an OMR authorization (see e.g. Grullon and Michaely, 2004; Lie, 2005; Gong, Louis, and Sun, 2008; and Chen and Wang, 2013).

Table 10 presents the post-announcement percentage changes in OROA for eight quarters for the sample of ASR firms and the control sample of OMR-only firms. All quarterly percentage changes are in reference to the announcement quarter (Qtr. 0). Consistent with Lie (2005), we find that both ASR firms and OMR-only firms exhibit a decline in operating performance following repurchase announcements. More importantly, the difference in mean or median OROA between the two groups is not significant across individual quarters and over the (+1, +4) or (+1, +8) period. In addition, the matched-pair results suggest no significant change in the performance-adjusted OROA of an ASR firm *relative* to a matched OMR firm. In other words, ASR firms experience a similar pattern of decline as other repurchasing firms during the two years following the repurchase announcement. These results provide little support for management's use of an ASR to signal the firm's positive outlook *relative* to other non-ASR repurchasing firms. Additionally, when considering the earlier finding that the pre-repurchase cumulative abnormal returns for ASR firms are not significant, and the pre-repurchase CAR is not significantly different between the ASR and non-ASR groups, we conjecture that signaling undervaluation is not the primary motivation for management's use of an ASR. The results do, however, provide further support for the free cash flow hypothesis. Although operating performance is declining in the post-announcement period for all repurchasing firms, ASR-firms tend to be much larger and more profitable than non-ASR firms. In addition, ASR firms are likely to be maturing firms with reduced investment opportunity sets compared to non-ASR firms. Therefore, our results strongly support the notion that management's main motivation to initiate an ASR is to convey its commitment to return excess cash to shareholders more efficiently than can be accomplished using an OMR alone.

6 Conclusion

Over the last decade, Accelerated Share Repurchase (ASR) contracts have been used by U.S. firms to quickly repurchase large amounts of their outstanding equity. In the last several years, ASRs have now become the second largest method of share repurchase in the U.S., representing 10 percent of all shares repurchased. While several researchers have examined the use of ASRs, substantial variation exists among the results in this nascent literature. Researchers have been forced to hand-collect information about ASRs which has led to substantial differences among data sets due to identification problems. As a result, the information content contained in an ASR *relative* to an OMR remains an *unresolved issue* in the literature (Farre-Mensa et al, 2014).

Using a hand-collected sample of 716 privately negotiated ASR contracts over the period from 2004 to 2015, we examine the firm's motives for the use of an ASR. As ASR contracts allow for the immediate delivery of shares, while also representing a more credible (legal) commitment to repurchase, we focus our attention on motives related to these two characteristics including quarterly earnings

management, and/or signaling, either the firm's commitment to disgorge excess cash (agency theory) or undervaluation (asymmetric information hypothesis). Preconditioning only on firms that repurchase in the quarter, univariate results suggest that some firms may be utilizing ASRs in an effort to meet or beat quarterly analyst EPS forecasts. However, multivariate analysis reveals that the likelihood of initiating an ASR is increasing in both the accretive nature of the repurchase and the *positive* pre-repurchase earning surprise. As such, we find that a firm is more likely to initiate an accretive ASR in the quarter if it would have met or exceeded its EPS forecast *without* the effect of the repurchase. Thus, while our results provide evidence that ASRs are used for short-term earnings management for some firms, they are also employed for other motives, especially for those firms with strong earnings performance prior to the repurchase.

Our univariate results are more consistent with the agency theory of free cash flow, as we find that ASR firms are larger, have similar levels of cash and leverage, have higher levels of free cash flow and higher pre-repurchase operating performance, but are facing declining investment opportunity sets as reflected in slowing rates of sales growth and lower market-to-book ratios as compared to non-ASR firms. Also, we find that pre-repurchase abnormal returns for ASR firms are indistinguishable from zero and are not significantly different from those of non-ASR firms, casting doubt on signaling undervaluation as a primary motive for ASRs. Multivariate results further strengthen the case for the free cash flow hypothesis as we find the likelihood that firms initiate an ASR are increasing in the levels of cash and free cash flow to assets, as well as operating performance, but are decreasing in both the rate of sales growth and market-to-book ratios, both proxies for the firm's growth opportunities.

We further extend our analysis of the signaling effects of an ASR by examining both the short-term market response to the announcement of an ASR as well as the post-announcement operating performance. In contrast to prior literature, we find cumulative abnormal returns (CARs) surrounding ASR announcements are positive and significantly higher than those of firms that only announce open market repurchases. However, we find that operating performance for both ASR and non-ASR firms is declining over the 8-quarters post-repurchase announcement; although, the difference is not significant between the two groups. Taken together, these findings suggest that ASR announcements lead to a more positive short-term market reaction than OMR announcements. In addition, the market responds more favorably to a purchase conducted by firms with strong operating performance at or prior to the announcement and/or more cash on hand. The ASR firms tend to be those with solid profitability but reduced investment opportunity sets, and the market responds favorably to these firms due to their commitment to distribute excess cash and avoid the agency cost of overinvestment. However, both ASR and OMR firms experience a decline in long-term operating performance after the announcement. Overall, our results provide support for management's use of an ASR to mitigate the agency costs of free cash flow, but not primarily as a means to signal undervaluation.

Appendix A: Control variables

This table reports the source and construction of control variables used in multivariate regression analyses. All financial variables are calculated using data from the Compustat and CRSP databases unless otherwise noted. Additionally, all values are as of the prior fiscal year-end unless otherwise noted in the description.

Variable name	Description
Amihud illiquidity	Amihud (2002) describes his illiquidity measure as "… the average ratio of the daily absolute return to the (dollar) trading volume on that day … this ratio gives the absolute (percentage) price change per dollar of daily trading volume …" (p.34). Since our study covers both firm-quarter data and actual announcement dates, we calculate separate measures of Amihud illiquidity for each our sample datasets based on relevant dates. For our sample of firm-quarters, we calculate average Amihud illiquidity for each firm over the period beginning 255 days prior to and ending 46 days prior to the lagged actual period end date (APDEDATEQ). For our sample of repurchase announcements, we calculate average Amihud illiquidity for each firm over the period beginning 255 days prior to and ending 46 days prior to the actual announcement date. In both samples, we take the natural logarithm of average Amihud illiquidity for comparative purposes.
Total assets	Book value of total assets (AT) adjusted to 2015 dollars (CPI)
Cash to assets	Calculated as cash and cash equivalents (CHE) divided by total assets (AT).
Dividend yield	Calculated as total annual common dividends paid (DVC) divided by the market value of equity at fiscal year-end. If common dividends paid (DVC) is missing or equal to zero, dividend yield is set equal to zero.
Employee options (exercisable)	Calculated as total unexercised exercisable options (OPTEX) scaled by common shares outstanding (CSHO) at fiscal year-end
Executive options (exercisable)	Calculated as the sum of total unexercised, exercisable options (OPT_UNEX_EXER_NUM) grouped by firm (GVKEY) and year from the Execucomp Annual Compensation database scaled by common shares outstanding (CSHO) at fiscal year-end
Free cash flow	Based on the measure taken from Acharya, Almeida, and Campello (2007), as in Bargeron et al (2011), we start with operating income before depreciation (OIBDP) and subtract the sum of depreciation and amortization (DP), total income taxes (TXT), interest expense (XINT), preferred (preference) dividends (DVP), and common dividends (DVC). This amount is then scaled by total assets (AT).
HP-Index	Defined by Hadlock and Pierce (2010), the HP-Index is a relative measure of firm financial constraints based on firm size and age. The index is calculated annually by taking the log of the minimum of the firm's total assets or $4.5 billion (min (total assets, $4.5 billion)) as firm size, as well as the square of this amount (firm size squared), in addition to the minimum of the firm's total age or 37 years (min (age, 37 years)) as firm age. These variables are then multiplied by coefficients determined by Hadlock and Pierce through ordered logit regressions to arrive at a relative index value of financial constraints as such: HP-Index = (-0.737*Firm Size) + (0.043*Firm Size Squared) – (0.040* Firm Age). The smallest HP-index value (least financially constrained) is (-4.6368867) which represents a firm with $4.5 billion or more in total assets and that has been in existence for 37 years or longer. Financial constraints are considered increasing in the HP-index.

Variable name	Description
Leverage (book)	Calculated as long-term debt (DLTT) plus debt in current liabilities (DLC) divided by total assets (AT)
Leverage deficit	Defined as the firm's 'calculated' market leverage minus its predicted target leverage as outlined in Uysal (2011). Target leverage is the predicted value obtained by annually regressing calculated market leverage of all firms in the merged Compustat-CRSP database for years 2003 through 2015 on firm level explanatory variables that have been found to be determinants of capital structure. These explanatory variables include one-year lagged values of the natural logarithm of sales, market-to-book, research and development expense scaled by total assets, selling, general and administrative expense scaled by sales, EBITDA scaled by total assets, net property, plant and equipment scale by total assets, one-year total stock return, and market leverage.
Market to book	Calculated as the market value of assets (common shares outstanding (CSHO) multiplied by fiscal year-end closing price (PRCC_F) plus total assets (AT) minus common equity (CEQ) minus book value of deferred taxes (TXDB)) divided by the book value of total assets (AT).
Market value of equity	Calculated as common shares outstanding (CSHO) multiplied by fiscal year-end closing share price (PRCC_F) adjusted to 2015 dollars (CPI)
Operating ROA	Calculated as operating income before depreciation and amortization (OIBDP) divided by total assets (AT)
Prior stock performance	For our sample of firm-quarters, we calculate prior cumulative abnormal returns for each firm over the period beginning 44 days prior to and ending 4 days prior to the lagged actual period end date (APDEDATEQ). For our sample of repurchase announcements, we calculate prior cumulative abnormal returns for each firm over the period beginning 44 days prior to and ending 4 days prior to the actual announcement date.
Takeover Rumor	Defined as an indicator variable that takes a value of one if the firm has been the target (or rumored target) of a takeover attempt in the 6 months preceding the lagged actual period end date (APDEDATEQ) for the sample of firm-quarter repurchases or in the 6 months preceding the actual announcement date in the sample of repurchase announcements.
Sales growth	Calculated as the compound rate of sales (SALE) growth over the prior three years
Standard deviation of stock returns	For our sample of firm-quarters, we calculate the standard deviation of prior stock returns for each firm over the period beginning 255 days prior to and ending 46 days prior to the lagged actual period end date (APDEDATEQ). For our sample of repurchase announcements, we calculate the standard deviation of prior stock returns for each firm over the period beginning 255 days prior to and ending 46 days prior to the actual announcement date.

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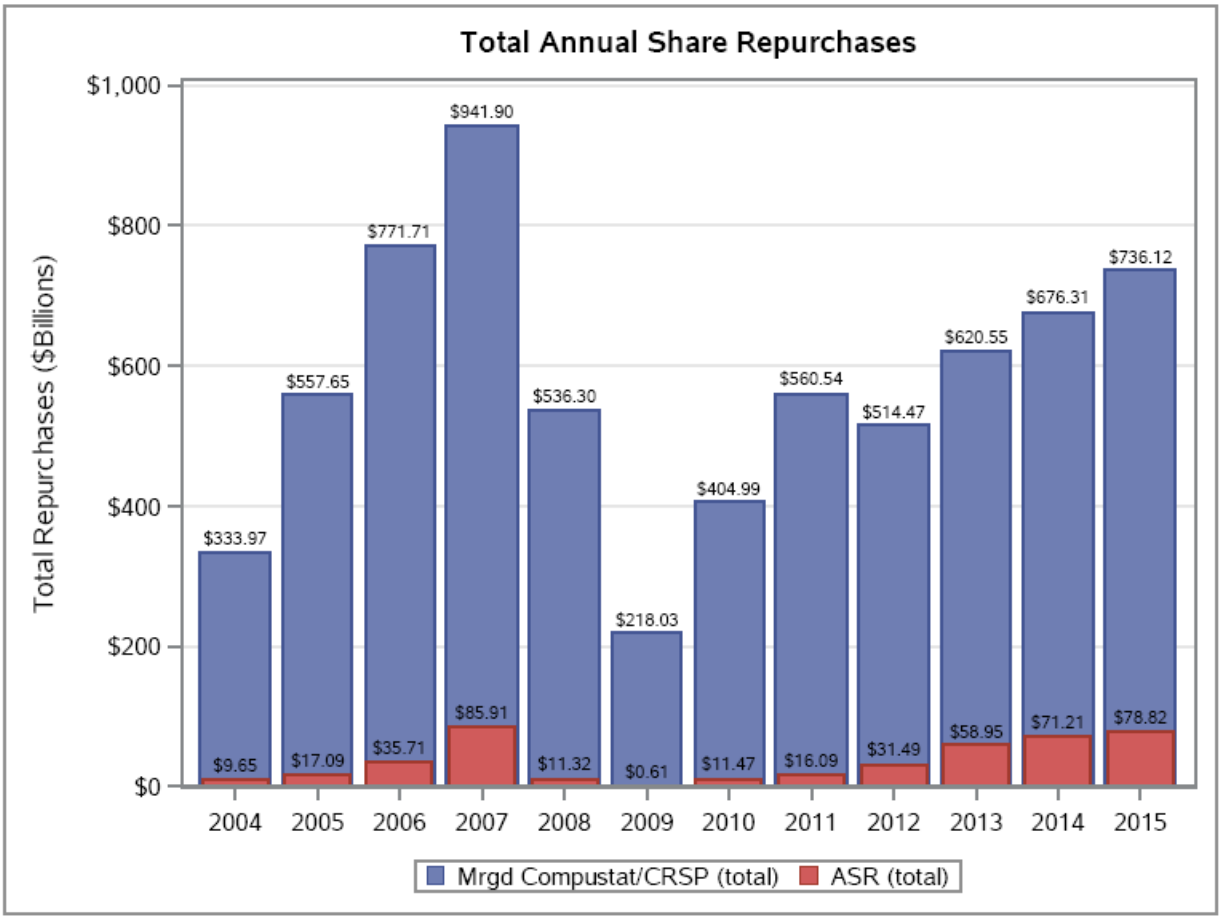

Fig 1. Total annual share repurchases 2004 to 2015: Merged Compustat/CRSP versus ASR. All dollar amounts ($billions) have been adjusted to 2015 dollars using CPI.

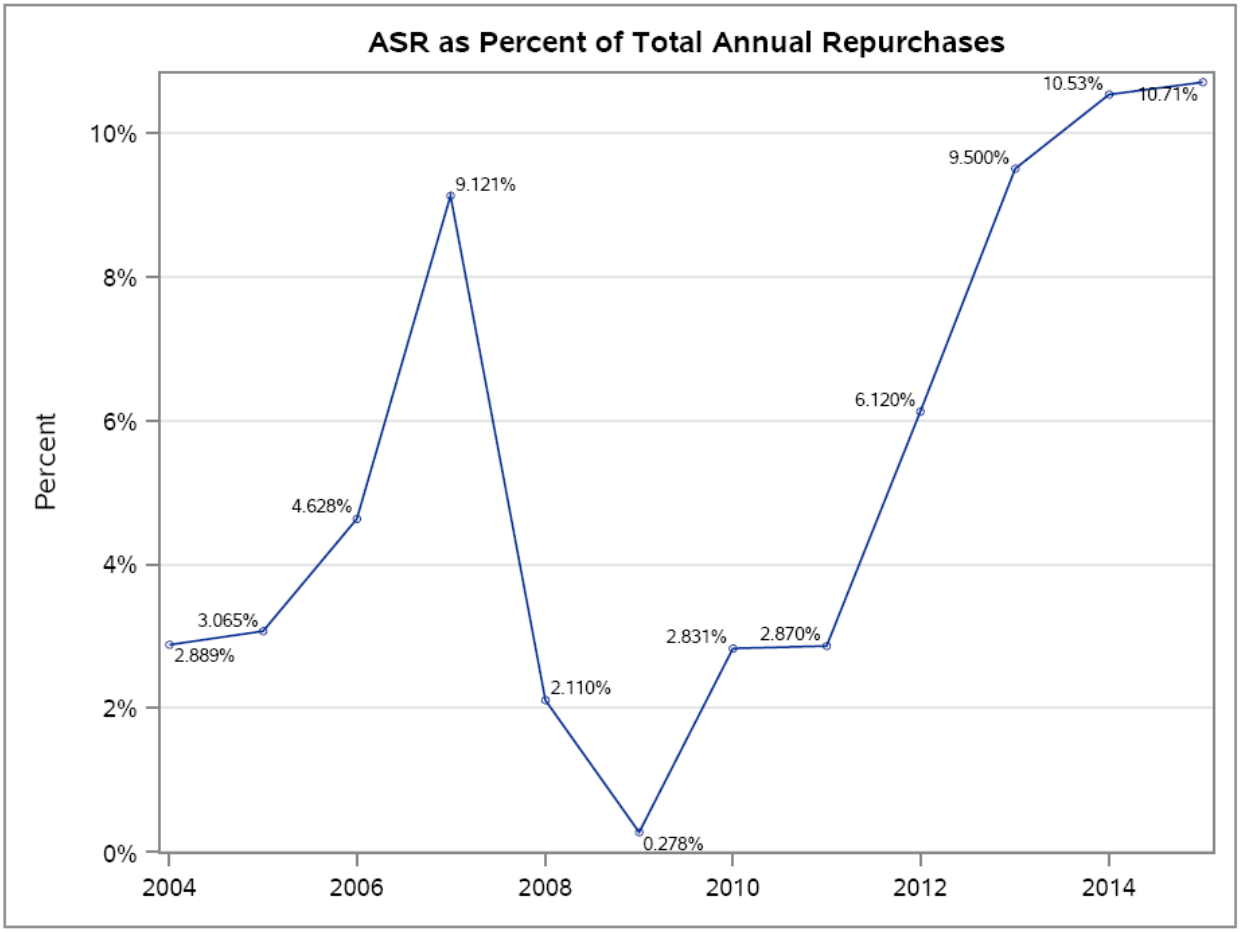

Fig 2. ASRs as a percent of total merged Compustat/CRSP repurchases.

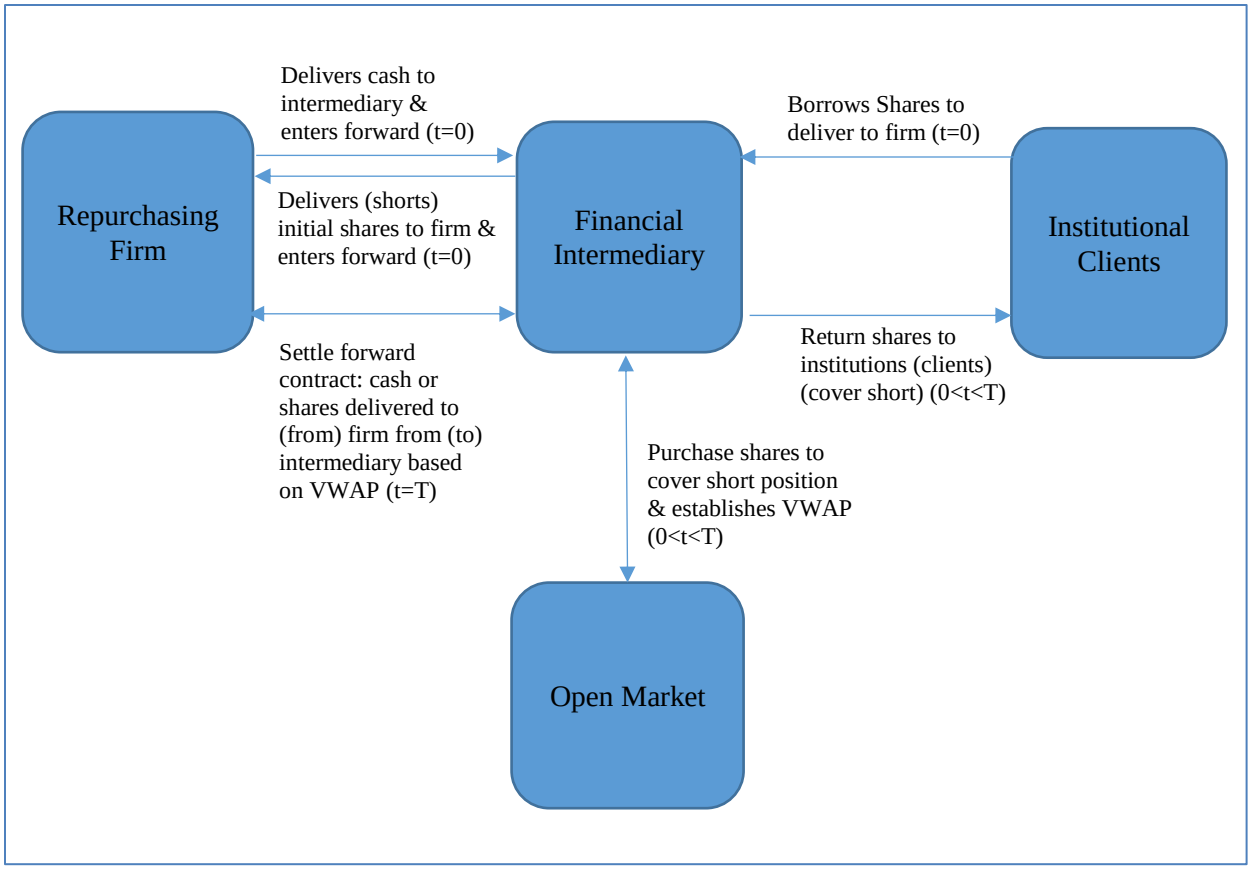

Fig 3. Contract structure of an accelerated share contract and forward agreement. At time (t=0) the firm contracts with a financial intermediary, most often an investment bank, for the immediate (or accelerated) purchase and delivery of the majority of its targeted shares (dollar amount). The intermediary typically borrows 80% or more of the dollar amount, or quantity, of shares stated in the ASR contract from institutional investors and immediately short sells them to the issuer. The intermediary then covers its short position by purchasing the shares in the open market over a contractual period, typically anywhere from a few months to a year, and thus, establishes a volume-weighted average price (VWAP) for the repurchased shares. Upon initiation of the ASR, the issuer additionally enters a long forward contract with the intermediary to eliminate the risk of price increases faced by the intermediary while it covers its short position in the open market. Upon maturity of the forward contract (t=T), if the VWAP is higher than the initial price paid by the issuer for its shares, the issuer will settle the forward by either delivering cash or additional shares to the intermediary. If the VWAP is lower, then the intermediary will have the option to deliver additional shares (which is now almost always the case) or to refund cash to the issuer.

Table 1: ASR summary statistics by year

The sample contains 716 privately negotiated Accelerated Share Repurchase (ASR) programs covering the period from 2004 through 2015. Announcement data (or subsequent mention after program completion) is hand-collected from multiple databases including the ABI/Inform database, SEC Edgar, Lexis-Nexus, Google and others. The financial details for each program are obtained from reported financial statements (8-Ks, 10-Qs, 10-Ks, EX-99s) as recorded in the Securities Exchange Commission's online Edgar database. Panel A reports the summary statistics for all ASR programs by year in number of programs, total dollar amounts (adjusted to 2015 dollars), number of distinct firms, and the percentage of all annual recorded share repurchases as reported in the merged Compustat/CRSP database. Distinct ASR firm numbers are reported by year. The total number of 346 distinct firms covers the entire period from 2004 thru 2015. Panel B reports summary statistics by year that indicate whether the firm publically announced the ASR program (as indicated by whether the firm issued a press release and/or filed a concurrent 8-K with the SEC) and, if so, was the program announced simultaneously with a new (or updated) share repurchase authorization. Panel B also reports statistics that indicate whether the ASR was part of a preexisting or concurrently announced repurchase authorization or if the ASR was a stand-alone program, either solely authorized (no other repurchase authorization exists) or authorized in addition to, but independent of, the firm's existing share repurchase authorization.

Panel A: ASR transaction data by year

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
ASR contracts (distinct)	17	37	62	97	25	5	36	56	53	92	121	115	716
Percent of total ASRs	2.37%	5.17%	8.66%	13.55%	3.49%	0.70%	5.03%	7.82%	7.40%	12.85%	16.90%	16.06%	100.00%
Dollar amount ($billions)	9.65	17.09	35.71	85.91	11.32	0.61	11.47	16.09	31.49	58.95	71.21	78.82	428.31
All repurchases ($billions)	333.97	557.65	771.71	941.90	536.30	218.03	404.99	560.54	514.47	620.55	676.31	736.12	6,872.6
Percent of all repurchases	2.89%	3.07%	4.63%	9.12%	2.11%	0.28%	2.83%	2.87%	6.12%	9.50%	10.53%	10.7%	6.23%
ASR firms (distinct)	16	33	44	81	20	5	32	41	38	67	84	88	346

Panel B: ASR announcement (authorization) detail by year

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Publically announced	14	34	51	88	23	5	32	45	37	62	65	74	530
Percent publically (%)	82.35%	91.89%	82.26%	90.72%	92.00%	100.00%	88.89%	80.36%	69.81%	67.39%	53.72%	64.35%	74.02%
Simultaneously announced	5	11	19	30	8	4	7	6	10	16	17	16	149
Percent simultaneously (%)	29.41%	29.73%	30.65%	30.93%	32.00%	80.00%	19.44%	10.71%	18.87%	17.39%	14.05%	13.91%	20.81%
Preexisting authorization.	16	28	56	79	24	5	32	53	50	91	118	112	664
Percent preexisting (%)	94.12%	75.68%	90.32%	81.44%	96.00%	100.00%	88.89%	94.64%	94.34%	98.91%	97.52%	97.39%	92.74%
Stand-alone ASR	1	9	6	18	1	0	4	3	3	1	3	3	52
Percent stand-alone (%)	5.88%	24.32%	9.68%	18.56%	4.00%	0.00%	11.11%	5.36%	5.66%	1.09%	2.48%	2.61%	7.26%

Table 2: ASR summary statistics by program

The above table reports summary statistics concerning the details of our sample of 716 accelerated share repurchase (ASR) programs (contracts) over the period from 2004 to 2015. Panel A reports summary statistics dealing with program dollar amount (adjusted to 2015 dollars), percent of equity sought, percent of most recent repurchase authorization (or incremental update to an existing authorization), the number of shares initially delivered by the financial intermediary, total shares received under the ASR program, total shares received during the quarter of ASR contract initiation, and the total percentage of shares received in the quarter of contract initiation. *Represents the percent of shares acquired through an ASR program out of the total shares acquired during a quarter when the firm is simultaneously purchasing shares by some method in addition to the ASR. Panel B reports the distribution of ASR programs by Fama-French 12 industry classifications.

Panel A: ASR program characteristics

	N	Mean	Min	Q1	Median	Q3	Max
Dollar amount ($mil)	716	598.20	15.02	105.37	254.36	579.70	14,289.01
Percent equity sought (%)	706	4.18%	0.19%	1.60%	3.01%	5.62%	64.39%
Percent of recent authorization (%)	708	42.77%	2.17%	20.00%	33.33%	58.18%	400.00%
Initial shares delivered (mil)	714	10.40	0.07	2.29	4.76	11.10	203.70
Initial shares delivered (%)	695	87.34%	8.50%	80.00%	87.58%	99.90%	105.20%
Total shares acquired - program (mil)	716	11.58	0.09	2.54	5.45	12.06	203.70
Shares acquired - initial quarter (mil)	716	10.49	0.07	2.30	4.80	11.30	203.70
Shares acquired - initial quarter (%)	716	90.64%	74.71%	90.52%	88.06%	93.70%	100.00%
Acquired thru ASR (w/OMR) - int. qtr. (%)*	410	76.62%	6.14%	63.23%	81.84%	92.80%	99.98%

Panel B: ASR programs by Fama-French (12) industries

No	Fama-French Industry	N	%
1	Consumer non-durables	31	4.33%
2	Consumer durables	13	1.82%
3	Manufacturing	75	10.47%
4	Energy	11	1.54%
5	Chemicals	25	3.49%
6	Business equipment	116	16.20%
7	Television and telecom	21	2.93%
8	Utilities	32	4.47%
9	Wholesale and retail	108	15.08%
10	Healthcare	60	8.38%
11	Finance	150	20.95%
12	Other	74	10.34%
	Total	716	100.00%

Table 3: Characteristics of repurchasing firms: ASR versus non-ASR

This table reports summary statistics for a sample of 52,443 firm-quarter observations from merged Compustat/CRSP/IBES databases with positive reported quarterly share repurchases (>$10K) over the period from 2004 to 2015. Our original hand-collected sample of 716 accelerated share repurchases (ASR) contracts are aggregated by firm-quarter (692) and then are matched, if possible, to a unique firm-quarter record from the previously merged Compustat/CRSP/IBES database resulting in positive matches for 621 ASR firm-quarter observations. Appendix A describes the construction of all variables. All variables have been winsorized at the 1% level to mitigate the effect of outliers. Significance of differences in means (medians) are determined using standard t-tests (Wilcoxon rank sum test). We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

	Non-ASR			ASR			Differences	
Firm Characteristics	N	Mean	Median	N	Mean	Median	Mean(s)	Median(s)
Assets ($mil)	51,594	14,487.67	2,269.35	620	33,891.57	8,119.54	-19,403.90***	-5,850.19***
Market value of equity ($mil)	51,587	9,412.64	1,987.50	620	18,949.65	7,370.94	-9,537.01***	-5,383.44***
Leverage	51,351	0.2012	0.1707	617	0.2050	0.1804	-0.0038	-0.0098***
Cash to assets	51,588	0.1564	0.0930	620	0.1421	0.0953	0.0143**	-0.0023
Free cash flow	41,926	0.0489	0.0457	535	0.0560	0.0476	-0.0072***	-0.0019**
Operating ROA	50,331	0.1296	0.1226	613	0.1365	0.1331	-0.0069**	-0.0105***
Sales growth	50,347	0.1056	0.0697	614	0.0851	0.0612	0.0205***	0.0085
Market to book	51,580	1.8538	1.4590	620	1.8121	1.5252	0.0417	-0.0662
Prior stock performance	50,956	-0.0022	-0.0012	617	-0.0030	0.0000	0.0008	-0.0012
Prior stock volatility	50,956	0.0222	0.0197	617	0.0160	0.0146	0.0063***	0.0050***
Ln (Amihud illiquidity)	50,956	-6.6367	-6.9313	617	-8.5520	-8.5381	1.9153***	1.6068***
Leverage deficit	39,124	-0.0099	-0.0113	492	-0.0111	-0.0104	0.0012	-0.0009
Dividend yield	51,819	0.0141	0.0078	617	0.0131	0.0106	0.0011**	-0.0028**
HP-Index	50,820	-3.8631	-3.7893	609	-4.1215	-4.1169	0.2584***	0.3276***
Executive options (exercisable)	51,822	0.0088	0.0038	621	0.0079	0.0051	0.0009***	-0.0013***
Employee options (exercisable)	51,822	0.0374	0.0278	621	0.0319	0.0254	0.0055***	0.0024**
Target rumor	51,822	0.0000	0.0000	621	0.0129	0.0000	-0.0129***	0.0000***

Table 4: Earnings management analysis: summary statistics for firm-quarter repurchases of non-ASR versus ASR firms

These tables report summary statistics for all 52,443 firm-quarter share repurchases from 2004 to 2015. *Mean forecasted EPS* is the earliest analyst consensus forecasted EPS for the fiscal firm-quarter taken from the IBES Summary database. *Actual_EPS* is the IBES 'reported' actual EPS for the fiscal firm-quarter taken from the IBES Summary database. *Actual earnings surprise* represents the difference between the IBES reported actual EPS and the consensus forecasted EPS. *ASIF1_EPS* represents the 'pre-repurchase' EPS for the fiscal firm-quarter as if the quarterly repurchases had not occurred (mechanical 'denominator' effect only). *ASIF1 earnings surprise* represents the 'pre-repurchase' difference between the IBES *Mean forecasted EPS* and *ASIF1_EPS* for the fiscal firm-quarter (denominator effect only). *Actual_EPS - ASIF1_EPS* represents the increase (decrease) in fiscal firm-quarter EPS resulting from all quarterly share repurchases (denominator effect only). *ASIF2_EPS* represents the pre-repurchase EPS for the fiscal firm-quarter as if the quarterly repurchases had not occurred including the opportunity (financing) costs of repurchases (includes both the 'numerator' as well as the 'denominator' effects). *ASIF2 earnings surprise* represents the 'pre-repurchase' difference between the IBES *Mean forecasted EPS* and *ASIF2_EPS* for the fiscal firm-quarter (both numerator and denominator effects). *Actual_EPS – ASIF2_EPS* represents the increase (decrease) in fiscal firm-quarter EPS resulting from all quarterly share repurchases (both numerator and denominator effects). Refer to Section 4 for a complete description of the 'ASIF' variables. Panel A displays summary statistics for all firm-quarter share repurchases. Panel B displays summary statistics only for 'accretive" share repurchases, i.e. firm-quarter repurchases that increase reported EPS by at least $0.01. Panel C displays summary statistics only for those firm-quarter repurchases that allow the firm to meet or beat IBES mean forecasted EPS. Panels B and C display estimates for *ASIF2_EPS* only as it can be argued that the 'numerator' effect must be considered to determine if a repurchase is accretive to earnings. While not reported, the results for *ASIF1_EPS* estimates are like those of *ASIF2_EPS*. All variables have been winsorized at the 1% level to mitigate the effect of outliers. Significance of differences in means (medians) are determined using standard t-tests (Wilcoxon rank sum test). We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

Panel A: All firm-quarter repurchases

	All Firms (1)		Non-ASR (2)		ASR (3)		Differences (2) -(3)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total dollar amount ($mil)	91.647	7.774	85.086	7.421	589.988	251.492	-504.902***	-244.071***
Total shares acquired (mil)	2.248	0.313	2.121	0.300	12.810	5.958	-10.689***	-5.658***
Percent equity sought	0.0111	0.0055	0.0107	0.0054	0.0421	0.0318	-0.0314***	-0.0265***
Mean forecasted EPS ($)	0.5244	0.3900	0.5218	0.3900	0.7422	0.6700	-0.2204***	-0.2800***
Actual_EPS ($)	0.5283	0.4000	0.5254	0.4000	0.7673	0.6900	-0.2419***	-0.2900***
Actual earnings surprise ($)	0.0047	0.0100	0.0045	0.0100	0.0247	0.0200	-0.0202***	-0.0100***
ASIF1_EPS ($)	0.4571	0.3550	0.4543	0.3500	0.6883	0.6087	-0.2340***	-0.2587***
ASIF1 earnings surprise ($)	-0.0739	-0.0100	-0.0741	-0.0100	-0.0603	-0.0300	-0.0138	-0.0200***
Actual_EPS - ASIF1 EPS ($)	0.0622	0.0000	0.0621	0.0000	0.0752	0.0300	-0.0131	-0.0300***
ASIF2_EPS ($)	0.4604	0.3600	0.4580	0.3500	0.6836	0.6100	-0.2256***	-0.2600***
Actual_EPS - ASIF2_EPS ($)	0.0697	0.0000	0.0695	0.0100	0.0857	0.0300	-0.0162	-0.0200***
ASIF2 earnings surprise ($)	-0.0742	-0.0100	-0.0743	-0.0100	-0.0577	-0.0300	-0.0166	-0.0200**
Number of Firms (N)	52,443		51,822		621			

Table 4: Earnings management analysis: Summary statistics for firm-quarter repurchases of non-ASR versus ASR firms (cont.)

Panel B: Accretive repurchases: firm-quarter repurchases that increase reported EPS by at least $0.01

	All Firms (1)		Non-ASR (2)		ASR (3)		Differences (2) -(3)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total dollar amount ($mil)	121.813	17.610	113.269	16.388	634.229	270.883	-520.960***	-254.4950***
Total shares acquired (mil)	2.8893	0.5440	2.7172	0.5150	13.2092	5.8750	-10.492***	-5.3600***
Percent equity sought	0.0127	0.0072	0.0123	0.0070	0.0410	0.0316	-0.0288***	-0.0246***
Mean forecasted EPS ($)	0.6562	0.5100	0.6536	0.5100	0.8132	0.7450	-0.1596***	-0.2350***
Actual_EPS ($)	0.6760	0.5300	0.6731	0.5200	0.8488	0.7850	-0.1756***	-0.2650***
Actual earnings surprise ($)	0.0183	0.0200	0.0181	0.0200	0.0322	0.0200	-0.0141*	-0.0000*
ASIF2_EPS ($)	0.4987	0.4100	0.4959	0.4000	0.6685	0.6200	-0.1726***	-0.2200***
Actual_EPS - ASIF2_EPS ($)	-0.1658	-0.0600	-0.1662	-0.0600	-0.1437	-0.0600	-0.0225	0.0000
ASIF2 earnings surprise ($)	0.1767	0.0600	0.1767	0.0600	0.1774	0.0700	-0.0007	-0.0100**
Number of Firms (N)	21,217		20,869		348			

Panel C: Meet/beat EPS: firm-quarter repurchases that allow the firm to meet or beat IBES mean forecasted EPS

	All Firms (1)		Non-ASR (2)		ASR (3)		Differences (2) -(3)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Total dollar amount ($mil)	107.194	12.679	99.096	12.000	678.443	250.198	-579.347***	-238.198***
Total shares acquired (mil)	2.7875	0.4765	2.6110	0.4540	15.2417	6.3468	-12.631***	-5.893***
Percent equity sought	0.0114	0.0064	0.0110	0.0062	0.0436	0.0328	-0.0326***	-0.0266***
Mean forecasted EPS ($)	0.5113	0.4000	0.5084	0.4000	0.7166	0.6700	-0.2082***	-0.2700***
Actual_EPS ($)	0.5500	0.4300	0.5468	0.4200	0.7705	0.7100	-0.2236***	-0.2900***
Actual earnings surprise ($)	0.0395	0.0200	0.0394	0.0200	0.0470	0.0200	-0.0076	-0.0000**
ASIF2_EPS ($)	0.3398	0.2900	0.3370	0.2800	0.5371	0.5000	-0.2001***	-0.2200***
Actual_EPS - ASIF2_EPS ($)	-0.1780	-0.0500	-0.1779	-0.0500	-0.1817	-0.0900	0.0038	0.0400***
ASIF2 earnings surprise ($)	0.2043	0.0900	0.2040	0.0900	0.2239	0.1400	-0.0199	-0.0500***
Number of Firms (N)	13,236		13,051		185			

Table 5: Correlation matrix

This table shows the Pearson correlation matrix for the variable ASR, the 'ASIF2' earnings management variables of interest, and firm specific control variables used in logit multivariate regressions. ASR is a dummy variable which takes a value of one if the firm receives an initial delivery of shares as part of an accelerated share repurchase contract in the current quarter, and otherwise takes a value of zero. Refer to Section 4 for a complete description of the 'ASIF2' variables. The firm level control variables are described in detail in Appendix A. All continuous variables have been winsorized at the 1% level to mitigate the effect of outliers. Significance at the 10% level or lower is denoted by *.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
ASR [1]	1.00									
ASIF2_Surprise [2]	0.01*	1.00								
Accretive_ASIF2 [3]	0.03*	-0.09*	1.00							
MBEPS_ASIF2 [4]	0.01*	-0.08*	0.41*	1.00						
Ln (total assets) [5]	0.08*	0.01	0.09*	0.00	1.00					
Sales growth [6]	-0.01*	-0.03*	0.04*	0.01*	-0.02*	1.00				
Operating ROA [7]	0.01*	0.10*	0.15*	0.02*	-0.13*	0.12*	1.00			
Cash to assets [8]	-0.01*	0.02*	0.05*	0.10*	-0.36*	0.03*	0.10*	1.00		
Ln (market to book) [9]	0.00	0.11*	0.09*	0.10*	-0.27*	0.12*	0.63*	0.43*	1.00	
Leverage [10]	0.00	-0.06*	0.01	-0.02*	0.25*	0.03*	0.03*	-0.38*	-0.16*	1.00
Dividend yield [11]	-0.01	-0.02*	-0.07*	-0.08*	0.24*	-0.07*	-0.06*	-0.22*	-0.18*	0.22*
Ln (Amihud illiquidity) [12]	-0.09*	-0.03*	-0.21*	-0.10*	-0.73*	-0.06*	-0.30*	0.05*	-0.22*	-0.16*
Free cash flow [13]	0.01*	0.11*	0.15*	0.03*	-0.07*	0.12*	0.75*	0.09*	0.47*	-0.17*
Prior stock performance [14]	0.00	0.02*	-0.01*	0.01*	0.00	-0.01*	-0.03*	-0.02*	-0.05*	-0.02*
Prior stock volatility [15]	-0.06*	-0.11*	-0.10*	-0.01*	-0.34*	0.06*	-0.06*	0.21*	-0.08*	-0.06*
Leverage deficit [16]	0.00	-0.10*	-0.03*	0.01*	0.09*	0.03*	-0.15*	-0.11*	-0.23*	0.21*
HP-Index [17]	-0.05*	-0.05*	-0.09*	0.01*	-0.58*	0.18*	-0.07*	0.32*	0.16*	-0.19*
Employee options [18]	-0.02*	-0.01*	0.02*	0.09*	-0.23*	-0.01*	-0.05*	0.26*	0.09*	-0.15*
Executive options [19]	-0.01*	0.01	0.06*	0.05*	-0.14*	-0.02*	0.08*	0.11*	0.08*	-0.07*
Target rumor [20]	0.01*	-0.01	0.02*	0.02*	0.04*	0.00	0.01*	0.00	0.00	0.01*

	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
Dividend yield [11]	1.00									
Ln (Amihud illiquidity) [12]	-0.06*	1.00								
Free cash flow [13]	-0.30*	-0.19*	1.00							
Prior stock performance [14]	0.01*	0.01*	-0.02*	1.00						
Prior stock volatility [15]	-0.12*	0.33*	-0.12*	-0.03*	1.00					
Leverage deficit [16]	0.12*	0.02*	-0.14*	0.10*	0.00	1.00				
HP-Index [17]	-0.19*	0.52*	0.01	0.01	0.28*	-0.02*	1.00			
Employee options [18]	-0.17*	0.14*	0.01	0.02*	0.09*	0.03*	0.16*	1.00		
Executive options [19]	-0.14*	-0.02*	0.08*	0.01*	0.04*	0.00	0.00	0.49*	1.00	
Target rumor [20]	0.00	-0.05*	0.00	0.01*	0.01*	0.02*	-0.02*	0.01	0.00	1.00

Table 6: Logit regressions of the decision to initiate an ASR

This table reports the results from logit regressions that measure the likelihood that a firm will include an ASR in the current quarter as part of its preexisting (or currently) announced repurchase authorization. As described in Section 4.1, we condition only on firms that have positive repurchases in the quarter to arrive at a final sample of 52,443 firm-quarter observations. The dependent variable in all models (1-8) is ASR, a dummy variable which takes a value of one if the firm receives an initial delivery of shares as part of an accelerated share repurchase contract in the current quarter, and otherwise takes a value of zero. The first variable of interest is (1) ASIF2_Suprise, which measures the difference between the calculated pre-repurchase ASIF2 EPS and the IBES mean consensus EPS forecast taken at the beginning of the current quarter. We would expect the likelihood that an ASR is initiated in the quarter to be negatively related to the ASIF2_ Surprise (i.e. the probability should be decreasing in the positive size of the surprise if earnings management is the motivation). The second variable of interest is (2) ACCRETIVE_ASIF2, a dummy variable which takes a value of one if the firm's quarterly share repurchases are accretive, i.e. the repurchases increase reported EPS by one cent ($0.01) or more in the current quarter, and otherwise takes a value of zero. Lastly, the third variable of interest is (3) MBEPS_ASIF2, a dummy variable that takes a value of one if the firm is able to meet (or exceed) the IBES mean consensus EPS forecast as a result of share repurchases in the quarter, and otherwise takes a value of zero. Refer to Section 4 for a complete description of the 'ASIF2' variables. The firm level control variables are described in detail in Appendix A. In models (5-8), we omit both the Log of Total Assets as well as Operating ROA as they are highly correlated with the variables Log of Amihud Illiquidity and Free Cash Flow, respectively. See Table 5 for Pearson correlations of all variables used in the following logit regressions. All variables have been winsorized at the 1% level to mitigate the effect of outliers. Coefficients on the regressors are reported with their ρ-values in parentheses. Reported ρ-values are based on robust standard errors clustered by firm. Significance levels of 1%, 5%, and 10% are indicated by ***, **, and * respectively.

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ASIF2_Surprise	8.1392**			14.249***	7.7969*			13.3376**
	(0.0306)			(0.0082)	(0.0558)			(0.0237)
Accretive_ASIF2		0.3008**		0.6448***		0.2556*		0.6037***
		(0.0244)		(0.0000)		(0.0815)		(0.0000)
MBEPS_ASIF2			0.0972				0.0046	
			(0.4568)				(0.9735)	
Cash to assets	1.1504*	1.2299**	1.2607**	1.1565*	1.0919	1.1261	1.1191*	1.1459
	(0.0855)	(0.0487)	(0.0412)	(0.0899)	(0.1303)	(0.1006)	(0.0992)	(0.1199)
Free cash flow					3.4060	3.9881*	4.2101*	2.8062
					(0.1622)	(0.0753)	(0.0589)	(0.2677)
Operating ROA	4.0721**	4.5529***	4.7182***	3.8786**				
	(0.0183)	(0.0029)	(0.0023)	(0.0267)				
Sales growth	-0.4728	-0.3167	-0.2786	-0.5886	-0.4325	-0.2756	-0.2516	-0.4980
	(0.3651)	(0.4799)	(0.5242)	(0.2783)	(0.4251)	(0.5652)	(0.5950)	(0.3658)
Ln (market to book)	-0.9481**	-0.9323***	-0.9541***	-0.9461**	-1.2742***	-1.2536***	-1.2756***	-1.2338***
	(0.0111)	(0.0060)	(0.0050)	(0.0133)	(0.0002)	(0.0001)	(0.0000)	(0.0006)
Ln (total assets)	0.3734***	0.3879***	0.3932***	0.3590***				
	(0.0000)	(0.0000)	(0.0000)	(0.0000)				
Prior stock performance	-0.5703	-0.3532	-0.3996	-0.5237	-0.2583	0.0008	-0.0387	-0.2143
	(0.2177)	(0.4238)	(0.3617)	(0.2624)	(0.6097)	(0.9987)	(0.9364)	(0.6757)

Table 6: Logit regressions of the decision to initiate an ASR (cont.)

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Prior stock volatility	-72.365***	-69.133***	-71.181***	-66.854***	-62.501***	-58.552***	-60.194***	-58.247***
	(0.0000)	(0.0000)	(0.0000)	(0.0003)	(0.0017)	(0.0012)	(0.0009)	(0.0034)
Ln (Amihud illiquidity)					-0.4091***	-0.4243***	-0.4329***	-0.3895***
					(0.0000)	(0.0000)	(0.0000)	(0.0000)
Leverage deficit	-1.4703	-1.8828	-1.9652	-1.3051	-2.3088*	-2.7340**	-2.7976**	-2.1486*
	(0.2301)	(0.1616)	(0.1388)	(0.2931)	(0.0587)	(0.0431)	(0.0358)	(0.0843)
Dividend yield	-24.796***	-24.610***	-24.874***	-24.026***	-21.150*	-22.316*	-22.361*	-21.093*
	(0.0072)	(0.0036)	(0.0033)	(0.0095)	(0.0954)	(0.0638)	(0.0650)	(0.0990)
HP-Index					0.0131	-0.0248	-0.0131	-0.0095
					(0.9563)	(0.9132)	(0.9542)	(0.9685)
Employee options					0.0980	-0.0252	0.1274	-0.1727
					(0.9737)	(0.9930)	(0.9644)	(0.9539)
Target rumor					0.0920	0.2655	0.2722	0.0736
					(0.8871)	(0.6358)	(0.6252)	(0.9100)
Constant	-5.7306***	-5.9885***	-5.5714***	-6.0735***	-5.2577***	-5.6377***	-5.4813***	-5.6379***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Industry & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	33,298	35,500	35,500	33,298	27,973	29,206	29,206	27,973
Pseudo R-Squared (scaled)	0.1177	0.1231	0.1214	0.1255	0.1308	0.1373	0.1360	0.1374

Table 7: Logit regressions of the decision to initiate an ASR: matched pair

This table reports the results from logit regressions for a matched pair sample of the 621 ASR firm-quarters in our original sample. We choose matching firms from within our sample of 52,433 firm-quarters with positive repurchases with the following characteristics: (1) same 2-digit SIC industry code, (2) book value of total assets between 80% and 120% of the ASR sample firm at prior fiscal year-end, (3) market value of equity between 80% and 120% of the ASR sample firm at prior fiscal year-end, (4) matching firm-quarter observation occurs within plus or minus one fiscal year of the current sample ASR firm-quarter, (5) the matching firm quarter cannot have the same unique Compustat firm identifier (GVKEY), and the matching firm cannot have ASR repurchases within plus or minus one fiscal year of the current ASR firm-quarter observation. See Section 4 for a complete description of the matching process. This table reports the likelihood that a firm will include an ASR in the current quarter as part of its preexisting (or currently) announced repurchase authorization. The dependent variable in all models (1-8) is ASR, a dummy variable which takes a value of one if the firm receives an initial delivery of shares as part of an accelerated share repurchase contract in the current quarter, and otherwise takes a value of zero. Please refer to Table 6 (as well as Section 4) for a complete description of the three main 'ASIF2' variables of interest. The firm level control variables are described in detail in Appendix A. All variables have been winsorized at the 1% level to mitigate the effect of outliers. Coefficients on the regressors are reported with their ρ-values in parentheses. Reported ρ-values are based on robust standard errors clustered by firm. Significance levels of 1%, 5%, and 10% are indicated by ***, **, and * respectively.

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ASIF2_Surprise	40.669***			43.847***	29.099**			36.426***
	(0.0009)			(0.0003)	(0.0268)			(0.0069)
Accretive_ASIF2		0.1763		0.6294**		0.2104		0.7805***
		(0.4045)		(0.0118)		(0.3796)		(0.0095)
MBEPS_ASIF2			0.1213				-0.2021	
			(0.5924)				(0.4271)	
Cash to assets	2.1868**	2.6095***	2.5779***	2.2904**	1.8721	1.7152	1.6028	2.2241
	(0.0475)	(0.0079)	(0.0085)	(0.0401)	(0.1658)	(0.1361)	(0.1601)	(0.1068)
Free cash flow					18.486***	13.5987***	14.042***	18.114***
					(0.0003)	(0.0013)	(0.0008)	(0.0005)
Operating ROA	9.4096***	10.997***	11.228***	9.1392***				
	(0.0005)	(0.0000)	(0.0000)	(0.0010)				
Sales growth	-1.3120**	-1.0773*	-1.0995*	-1.3096*	-0.8475	-0.6192	-0.6652	-0.6217
	(0.0481)	(0.0901)	(0.0811)	(0.0579)	(0.2572)	(0.3727)	(0.3372)	(0.4057)
Ln (market to book)	-1.6929	-0.3407	-0.2967	-1.6087	-2.7127**	-1.7093	-1.8569*	-2.9304**
	(0.1566)	(0.7504)	(0.7837)	(0.1860)	(0.0359)	(0.1252)	(0.0989)	(0.0278)
Ln (total assets)	9.0485***	9.8450***	9.8585***	9.3591***				
	(0.0000)	(0.0000)	(0.0000)	(0.0000)				
Prior stock performance	-2.2274*	-0.7550	-0.7943	-2.4862*	-4.5479***	-2.2948*	-2.0371	-4.7456***
	(0.0806)	(0.4807)	(0.4622)	(0.0536)	(0.0018)	(0.0612)	(0.1039)	(0.0014)

Table 7: Logit regressions of the decision to initiate an ASR: matched pair (cont.)

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Prior stock volatility	-46.501*	-58.136**	-59.028***	-40.9139***	-5.6388	-45.994*	-46.880*	1.4823
	(0.0806)	(0.0137)	(0.0122)	(0.1177)	(0.8556)	(0.0895)	(0.0849)	(0.9620)
Ln (Amihud illiquidity)					-0.5017**	-0.6034***	-0.6156***	-0.4915**
					(0.0371)	(0.0098)	(0.0087)	(0.0438)
Leverage deficit	1.9476	1.4427	1.3267	1.6749	-0.3717	-0.8239	-0.3854	-0.2479
	(0.3591)	(0.4631)	(0.5052)	(0.4414)	(0.8809)	(0.7121)	(0.8661)	(0.9215)
Dividend yield	-21.455**	-13.4913	-13.5878	-19.401*	-9.6291	-4.2494	-5.7809	-8.5341
	(0.0497)	(0.1625)	(0.1603)	(0.0789)	(0.4659)	(0.7038)	(0.6063)	(0.5391)
HP-Index					-0.3615	-0.4836	-0.4306	-0.4361
					(0.3048)	(0.1189)	(0.1673)	(0.2223)
Employee options					3.8193	-5.1360	4.8262	3.5389
					(0.5442)	(0.3429)	(0.3730)	(0.5772)
Target rumor					-19.5118	-2.5290*	-2.5855*	-19.8530
					(0.9920)	(0.0907)	(0.0832)	(0.9917)
Industry & year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	764	843	843	764	655	707	707	655
Pseudo R-Squared (scaled)	0.3470	0.3109	0.3099	0.3650	0.3655	0.2900	0.2895	0.3899

Table 8: Market response to repurchase announcements

This table reports the 3-day and 5-day cumulative abnormal returns (CARs) for both ASR announcements and open market repurchase (OMR) authorizations. Of the original sample of 716 ASR contracts over the period from 2004 to 2015, 523 distinct ASR programs (530 ASR contracts) were announced through either a press release or an 8-K filing with the SEC (or both). Of the 523 (530) announced ASRs, 478 (90.19%) were announced as part of either a pre-existing (or concurrently) announced repurchase authorization (98 are announced simultaneously as part of a larger authorization), while 52 (9.8%) are considered 'standalone' ASRs that are authorized independent of any of the firm's other repurchase authorizations. We match all ASR announcements to the original (or concurrently) announced open market share repurchase in the Thompson Reuters' Securities Data Corporation (SDC) Platinum Mergers and Acquisition database to ensure that we do not report duplicate announcements. See Section 5.1 for a complete description of this process. Our final sample comprises the original 523 ASR announcements and 3,628 open market repurchase authorizations from the SDC for a total sample of 4,151 repurchase announcements over the period from 2004 to 2015. All abnormal returns are calculated using the market-model. We use the value-weight return on all CRSP firms listed on the NYSE, AMEX, or NASDAQ as a proxy for the market. The proxy for the risk-free rate is one-month T-bill rate obtained through the Federal Reserve. We use a standard event-methodology (Brown and Warner, 1985) to calculate abnormal returns with a parameter estimation period beginning 255 days prior to and ending 46 days prior to the event date with a required minimum of 100 days of returns during the estimation period. Significance of differences in means (medians) are determined using standard t-tests (Wilcoxon rank sum test). Significance levels of 1%, 5%, and 10% are indicated by ***, **, and * respectively.

	3-day CAR [-1, 0, 1]			5-day CAR [-2, 0, 2]		
	N	Mean	Median	N	Mean	Median
I. ASR (all)	522	0.0164***	0.0140***	522	0.0195***	0.0153***
A. Part of repurchase authorization	472	0.0156***	0.0140***	472	0.0188***	0.0152***
B. Simultaneously announced w/auth.	98	0.0261***	0.0280***	98	0.0308***	0.0306***
C. Announced subsequent to auth.	374	0.0129***	0.0113***	374	0.0157***	0.0137***
D. Stand-alone ASR	50	0.0237***	0.0138***	50	0.0256***	0.0226***
II. Repurchase Authorizations (all)	2,986	0.0143***	0.0117***	2,986	0.0137***	0.0116***
A. Contains subsequently ann. ASR	329	0.0093***	0.0079***	329	0.0085***	0.0108***
B. Does not include ASR	2558	0.0146***	0.0119***	2,558	0.0138***	0.0112***
Differences in Means (Medians)						
ASR: subsq. vs. simul. ann. (I.C.-I.B.)		-0.0132**	-0.0167***		-0.0152**	-0.0169***
Auth.: no-ASR. vs. all ASR (II.B.- I.)		-0.0017	-0.0021		-0.0057**	-0.0041***
Auth.: no-ASR vs. simul. ASR (II.B.- I.B.)		-0.0114**	-0.0161***		-0.0170***	-0.0194***
Auth.: no-ASR vs. subseq. ASR (II.B.- II.A.)		0.0053**	0.0040*		0.0053*	0.0004

Table 9: OLS regressions of abnormal returns

This table reports results for OLS regressions of 3-day (5-day) cumulative abnormal returns (CARs) on the set of ASIF2 earnings management variables as well as the control variables from the logit regressions (see Appendix A). CARs are calculated using the sample of 4,151 repurchase announcements as described in Table 9. The dependent variable in models (1) thru (3) is the 3-day CAR around repurchase announcement [-1, 0, 1]. The dependent variable in models (4) thru (6) is the 5-day CAR around announcement [-2, 0, 2]. All variables have been winsorized at the 1% level to mitigate the effect of outliers. Coefficients on the regressors are reported with their ρ-values in parentheses. Reported ρ-values are based on robust standard errors clustered by firm. Significance levels of 1%, 5%, and 10% are indicated by ***, **, and * respectively.

Specification	(1)	(2)	(3)	(4)	(5)	(6)
ANCDTYPE	0.0068***	0.0077***	0.0078***	0.0108***	0.0116***	0.0116***
	(0.0098)	(0.0017)	(0.0015)	(0.0004)	(0.0000)	(0.0000)
Equity Sought (%)	0.0324**	0.0335**	0.0337**	0.0321*	0.0304*	0.0304*
	(0.0394)	(0.0244)	(0.0238)	(0.0894)	(0.0926)	(0.0930)
ASIF2_Surprise	0.2804**			0.3773**		
	(0.0412)			(0.0106)		
Accretive_ASIF2		0.0012			0.0008	
		(0.6217)			(0.7884)	
MBEPS_ASIF2			-0.0006			0.0010
			(0.8320)			(0.7550)
Cash to assets	0.0182	0.0191	0.0191	0.0213	0.0228*	0.0228*
	(0.1576)	(0.1224)	(0.1232)	(0.1342)	(0.0977)	(0.0970)
Free cash flow	-0.0569	-0.0613	-0.0605	-0.0162	-0.0167	-0.0163
	(0.2051)	(0.1521)	(0.1561)	(0.7505)	(0.7333)	(0.7391)
Operating ROA	0.0506*	0.0580**	0.0577**	0.0443	0.0476	0.0483
	(0.0885)	(0.0419)	(0.0439)	(0.2055)	(0.1581)	(0.1544)
Sales growth	-0.0085	-0.0120	-0.0117	-0.0055	-0.0097	-0.0096
	(0.2961)	(0.1476)	(0.1566)	(0.5527)	(0.3022)	(0.3068)
Ln (market to book)	-0.0041	-0.0025	-0.0025	-0.0052	-0.0030	-0.0031
	(0.4182)	(0.6031)	(0.6032)	(0.3617)	(0.5810)	(0.5689)
Industry & year controls	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,683	1,804	1,804	1,683	1,804	1,804
F value	2.23	2.29	2.27	2.79	2.47	2.47
Pr > F	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R-square	0.0399	0.0384	0.0383	0.0481	0.0425	0.0425

Table 10: Post-repurchase operating performance

This table reports percentage changes in post repurchase announcement operating performance for a sample of 312 ASR firms. Only 312 ASR firms out of 523 that 'announce' ASRs have sufficient data to calculate operating performance. Following Lie (2005), we measure operating performance as operating income before depreciation (Compustat item OIBDP) scaled by the cash-adjusted book value of total assets over the subsequent 8-quarters after announcement. Each sample ASR firm is matched to a control firm that announces an "open-market" repurchase program over the period from 2004 to 2015, as indicated in the Thompson Reuters' SDC database. Only firms (ASR and OMR) that repurchase 1% or more of outstanding equity during the announcement quarter are included. Control firms are matched on 2-digit (1-digit) industry code, market-to-book (MB) ratios between 80% and 120% (or ± 0.01) of the ASR sample firm at prior fiscal year-end, and average operating performance (OROA) over the (4) quarters prior to the announcement quarter (0) between 80% and 120% (or ± 0.01) of the ASR sample firm. All subsequent operating performance changes are in relation to OROA at the end of the announcement quarter (Qtr. 0). The last column includes "performance-adjusted" changes in OROA as calculated by first taking the difference between the OROA of the ASR firm and the OMR firm as of the end of each quarter and then calculating the percentage change based on the performance-adjusted OROA as of the end of Qtr. (0). All variables have been winsorized at the 1% level to mitigate the effect of outliers. Coefficients on the regressors are reported with their ρ-values in parentheses. Significance of differences in means (medians) are determined using standard t-tests (Wilcoxon rank sum test). Significance levels of 1%, 5%, and 10% are indicated by ***, **, and * respectively.

	ASR		OMR		Difference		Matched Pair Adjusted	
Qtr.	Mean	Median	Mean	Median	Mean	Median	Mean	Median
+1	0.0359	-0.0051	-0.0098	-0.0044	-0.0457	0.0007	1.4625	0.0250
	(0.1438)	(0.7490)	(0.6358)	(0.2207)	(0.1545)	(0.4831)	(0.6027)	(0.5748)
+2	0.0479	-0.0160	0.0121	0.0005	-0.0358	0.0165	-2.6491	-0.0439
	(0.1163)	(0.7117)	(0.7215)	(0.8268)	(0.4313)	(0.7515)	(0.4055)	(0.5217)
+3	0.0598	-0.0277*	-0.0405	-0.0219	-0.1004	0.0056	-0.8806	-0.1007
	(0.1347)	(0.0996)	(0.2046)	(0.1725)	(0.0498)	(0.9972)	(0.8770)	(0.8661)
+4	-0.1146***	-0.0213***	-0.0863***	-0.0225***	0.0283	-0.0012	-0.6046	0.4072
	(0.0011)	(0.0055)	(0.0063)	(0.0015)	(0.5465)	(0.5974)	(0.9322)	(0.8885)
+5	-0.0023	-0.0390	-0.0508	-0.0564***	-0.0486	-0.0174	6.1787	0.0809
	(0.9456)	(0.2328)	(0.2557)	(0.0026)	(0.3396)	(0.1638)	(0.2346)	(0.1510)
+6	-0.0900**	-0.0724***	-0.0243	-0.0827**	0.0657	-0.0103	-0.4232	-0.0834
	(0.0228)	(0.0060)	(0.5154)	(0.0198)	(0.2261)	(0.7889)	(0.9573)	(0.7113)
+7	-0.0570	-0.0534*	-0.0452	-0.1020***	0.0118	-0.0486	-0.1897	0.1633
	(0.1979)	(0.0523)	(0.1424)	(0.0011)	(0.8259)	(0.4284)	(0.9765)	(0.4036)
+8	-0.0745*	-0.0595***	-0.0209	-0.0600***	0.0536	-0.0004	-3.5623	-0.0184
	(0.0599)	(0.0040)	(0.6348)	(0.0011)	(0.3648)	(0.8995)	(0.7740)	(0.9081)
Avg. (Qtrs. 1-4)	0.0134	-0.0149	-0.0187	-0.0289*	-0.0321	-0.0140	-0.6788	-0.0206
	(0.5782)	(0.2759)	(0.3979)	(0.0795)	(0.3264)	(0.5193)	(0.6401)	(0.9830)
Avg. (Qtrs. 1-8)	-0.0163	-0.0396**	-0.0350	-0.0515***	-0.0187	-0.0119	-0.0793	-0.0494
	(0.5536)	(0.0350)	(0.1729)	(0.0010)	(0.6196)	(0.3625)	(0.9830)	(0.8513)