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Accelerated Share Repurchases

Leonce Barger, Manoj Kulchania, and Shawn Thomas

Abstract

Accelerated share repurchases (ASRs) are credible commitments by firms to repurchase shares immediately. Including an ASR in a repurchase program reduces the flexibility that firms have to alter an announced program in response to subsequent changes in the price and liquidity of its shares, unexpected shocks to cash flow and/or investment, etc. Thus, we investigate whether firms' decisions to include ASRs in their repurchase programs are associated with factors expected to influence the costs of lost flexibility and the benefits of enhanced credibility and immediacy. We find robust evidence consistent with the costs of lost flexibility and the benefits of credibility and immediacy being important determinants of ASR adoption. Additionally, we find that ASR announcements are associated with positive average abnormal stock returns.

1. Introduction

A fundamental area of research in financial economics is the study of firms' payout policies. The level, frequency, and form of payouts have individually and collectively been the subject of considerable investigation.³ This paper examines a recent and important innovation in the share repurchase form of payouts, namely, accelerated share repurchases (ASRs). Specifically, we analyze the determinants of the choice to include an ASR as part of a repurchase program as well as the choice of the fraction of the shares in a program to be obtained via an ASR. We also document the stock price reactions to announcements of ASRs.

In an accelerated share repurchase, a firm enters into a contract with an intermediary, typically an investment bank, whereby the intermediary immediately delivers a specified number of the firm's shares in exchange for cash based on an agreed upon price per share (ordinarily the most recent closing price). The intermediary obtains the shares that it delivers to the repurchasing firm by borrowing them, typically from institutions. The intermediary then covers its short position by purchasing shares in the market over a specified time period, normally several months. The ASR contract also includes a provision whereby the repurchasing firm is required to compensate or is entitled to receive compensation from the intermediary in shares or cash. The amount of compensation is based on the difference between the initial price per share paid to the intermediary and the estimated price per share the firm would have paid for the shares in an

open market repurchase (OMR) conducted during the same period over which the intermediary buys the shares to cover its short position. The settlement terms are also structured to compensate the repurchasing firm for the opportunity cost of full prepayment for the initial shares when the intermediary actually acquires these shares (closes its short position) over a period of several months. Note that, absent any contractual caps or floors on the settlement amount, the repurchasing firm bears all of the risk of changes in its stock price between ASR initiation and settlement. Thus, the intermediary essentially acts as the firm's proxy in borrowing the firm's shares and the proceeds the intermediary receives at initiation are a source of financing for the intermediary. In sum, ASRs are repurchases with an associated forward contract that can be settled in cash or shares of the firm.⁴ Fig. 1 illustrates the structure and timeline of an ASR and Appendix A includes a description of the common provisions observed in ASR contracts.

For a sample of repurchase programs announced between 1996 and 2008, we collect data on whether or not the programs include an ASR as well as details of the ASR transactions. The frequency of ASRs has increased dramatically in recent years. Over the period 2004–2008, \$131 billion of stock was repurchased via ASRs, and, in 2007, ASR announcements (97) represented about 26% of the total number of program announcements (376) as illustrated in Fig. 2. Further, over the period 2004–2008, the frequency of ASRs has generally exceeded that of privately negotiated repurchases, fixed-price self-tender offers, Dutch-auction self-tender offers, and large special dividends as illustrated in Fig. 3. Lastly, we note that in recent years, the “boilerplate” language used by firms to announce repurchase program authorizations has evolved to generally include ASRs as potential mechanisms by which share repurchases will be implemented.⁵ In short, ASRs have become part of the repurchase vernacular and an important element of repurchase program activity.

We analyze the stage of payout policy formulation where a firm has concluded that a share repurchase is the optimal choice for distributing cash to shareholders and must now decide how best to execute the repurchase. Given the vast majority of repurchase programs in recent years have been executed via OMRs in which firms announce authorizations to repurchase shares periodically at market prices, we initially consider the decision to undertake ASRs relative to the alternative of repurchase programs comprised of OMRs. In a subsequent section of the paper, we consider the decision to undertake an ASR relative to executing repurchase programs, in part, via self-tender offers or privately negotiated transactions.

In contrast to conducting an OMR-only repurchase program, including an ASR in a program commits the firm to actually repurchase shares and the firm receives these shares immediately. Consequently, the larger the ASR portion of a repurchase program, the less

flexibility the firm retains to significantly alter the program in response to subsequent changes in the price and liquidity of its stock, unexpected shocks to cash flow and/or investment, etc.⁶ In other words, the choice to undertake an ASR in a repurchase program represents a substantial partial exercise of the “flexibility option” inherent in a repurchase program that would otherwise be comprised entirely of OMRs, e.g., see Ikenberry and Vermaelen (1996) and Oded (2005). Therefore, factors affecting the costs of early exercise of the flexibility option inherent in an OMR should be important determinants of a firm’s choice to include an ASR in a repurchase program, a possibility we refer to as the *flexibility hypothesis*.

In an ASR, the repurchasing firm is credibly committed by contract to repurchase a significant number of shares immediately from the intermediary. In contrast, Stephens and Weisbach (1998) show that, 3 years after an OMR announcement, a substantial number of firms have repurchased no shares, about 10% of firms repurchased less than 5% of the shares authorized, and just more than half of firms bought back the total number of shares authorized.⁷ Simkovic (2009) reports that OMR completion rates have increased recently perhaps in response to enhanced required disclosures regarding repurchase activity.⁸ However, given the need to access quarterly filings for this information, OMR repurchases can still only be verified with significant time lags. ASRs entail no such delay or required verification by investors. Thus, the ASR portion of a repurchase program permits the firm to more credibly and quickly accomplish certain goals, e.g., signaling information to shareholders, adjusting capital structure, defending against an unwanted takeover attempt, avoiding dilution from the exercise of employee stock options, or managing reported earnings per share through changes in shares outstanding. To the extent that certain objectives of a repurchase would be better met with enhanced credibility and rapid completion of the repurchase, the particular objectives for a program should also influence a firm’s decision to include an ASR in the program, a possibility that we refer to as the *credibility and immediacy hypothesis*.

We find that the choice to undertake an ASR is significantly negatively (positively) associated with the variability of the firm’s share price and the stock market *illiquidity* of the firm’s shares (the size of the repurchase authorization). These findings are strongly consistent with the predictions of the flexibility hypothesis.

We find that the recent stock price performance of firms conducting ASRs is significantly better than firms not conducting ASRs, which is somewhat inconsistent with ASRs being used by firms facing greater undervaluation. However, further investigation of the undervaluation motive for ASRs using a variety of proxies for misvaluation generates some evidence suggesting that firms facing greater undervaluation are more likely to conduct ASRs. We find that firms tend to

include ASRs when the firms have fewer growth opportunities or are further below their target leverage ratios. We also find that firms tend to include ASRs when the firms have recently completed asset sales or been the targets of unsolicited takeover attempts. Lastly, we find limited evidence that ASRs are undertaken to manage reported earnings per share (EPS). Taken together, these results are consistent with the predictions of the credibility and immediacy hypothesis.

The time series of ASR activity is also shown to vary with changes in the firm characteristics that our analysis indicates are important in firms' decisions to undertake ASRs. For instance, illiquidity and the standard deviation of returns increased during the recent upheaval in financial markets. Given these changes, our model predicts a sharp drop in the number of ASRs in 2008, an outcome which we observe in the data. We also find that relative to alternative repurchase methods and large special dividends, ASRs serve a unique role and represent an important innovation in payout methods.

We also examine abnormal stock returns around ASR announcements. We find that ASRs announced simultaneously with repurchase programs are associated with positive and significant abnormal returns. Further, we find that ASRs announced subsequent to repurchase programs are also associated with positive and significant abnormal returns consistent with shareholders viewing these transactions as incrementally wealth increasing relative to repurchase programs comprised entirely of OMRs. Cross-sectional determinants of ASR abnormal returns are also investigated. We find that ASR announcement returns are positively associated with the fraction of shares repurchased via ASR, negatively associated with recent prior stock performance, and, consistent with ASRs reducing the likelihood of a successful acquisition, negatively associated with the firm having been the recent target of a takeover attempt. We also find that the likelihood that a firm announces an ASR subsequent to announcing a repurchase program is decreasing in the program announcement abnormal return. This finding is consistent with firms choosing to undertake an ASR to enhance the credibility of the signal inherent in the program announcement when that signal was weakly received by the market.

Our findings contribute generally to the literature on share repurchases and specifically to the nascent literature on accelerated share repurchases. The earliest paper to make note of ASRs was Cook and Kim (2006) which finds that firms engaging in repurchases using derivative contracts are generally larger than OMR firms. Marquardt, Tan, and Young (2009) show that firms more frequently conduct ASRs when managers' bonuses are tied to EPS, the repurchases are accretive to reported EPS for the period, and managers subsequently voluntarily leave the

firm. Marquardt et al. do not investigate the relative importance of the flexibility inherent in OMRs or the immediacy of ASRs (outside of reported EPS) in determining firms' choices to undertake ASRs. The present paper finds limited evidence of earnings management motives for ASRs in the presence of proxies for the value of flexibility. Thus, while the present paper's analysis indicates that earnings management is not likely the primary determinant of ASR choice, Marquardt et al. examine this issue in greater depth.

In a contemporaneous working paper, Chemmanur, Cheng, and Zhang (2010) investigate many of the same potential explanations for ASRs as the present paper. However, despite the similarities in the papers' aims, the conclusions reached by the papers in terms of which factors are associated with the decision to include an ASR as part of a repurchase program are very different. While Chemmanur, Cheng, and Zhang note prominently in their hypothesis development that an ASR does not permit a repurchasing firm the flexibility to change or discontinue a share repurchase as in an OMR, they do not include in their analysis several variables that proxy for the relative value of this flexibility across firms. In contrast, the present paper finds these variables to be the most important determinants of the choice to include an ASR in a program. As described below, 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 several important variables omitted by Chemmanur, Cheng, and Zhang as well as fundamental differences in sample construction.

Michel, Oded, and Shaked (2010) report positive average announcement period abnormal returns and negative post-announcement drift for ASR firms. Michel et al. interpret this pattern of returns as indicating that the information content of ASRs is negative but the market does not recognize the full extent of the "negative news" at announcement. Also, Akyol, Kim, and Shekhar (2009) investigate the efficacy of ASRs as takeover defenses. They find that firms choosing to conduct ASRs are significantly more likely to have been the subject of takeover rumors prior to the ASRs; however, they also find that, after conducting ASRs, these firms are still more likely to receive bids perhaps indicating that ASRs are not effective takeover deterrents.

This paper proceeds as follows. In Section 2, we describe the predictions of the hypotheses to be tested. We describe our sample construction in Section 3. We report results in Section 4 and offer a concluding discussion in Section 5.

2. Predictions of the Hypotheses

The cost of an ASR resulting from the early exercise of the flexibility option will clearly vary across firms. For instance, because the value of the flexibility option inherent in an OMR is increasing in the volatility of the firm's stock price, greater volatility increases the cost of exercising the option to adjust the repurchase amounts and timing. Thus, the flexibility hypothesis predicts that firms with greater stock market volatility will be less likely to elect to conduct an ASR.

Barclay and Smith (1988) posit that the stock market liquidity of a firm's shares should be an important determinant of a manager's choice of payout form, i.e., dividend versus repurchase. Brav, Graham, Harvey, and Michaely (2005) report that, in surveys and interviews, more than half of corporate executives "feel that the liquidity of their stock is an important or very important factor affecting their repurchase decisions." Similarly, Brockman, Howe, and Mortal (2008) find that firms initiating repurchases have significantly greater stock market liquidity than firms not initiating repurchases and repurchase size is increasing in the liquidity of the repurchasing firms' shares. While the results from these papers apply to the general decision to repurchase, these findings also suggest that the cost of credibly committing to quickly repurchase shares via an ASR will be less for firms with higher stock market liquidity. Purchasing large numbers of shares quickly has a greater impact on the price of less liquid shares, incrementally increasing the average price paid for the less liquid shares. Thus, the flexibility hypothesis predicts that firms with less liquid stock will be less likely to conduct an ASR.

Guay and Harford (2000) and Jagannathan, Stephens, and Weisbach (2000) also examine the determinants of payout method choice and find that greater variability of operating income is associated with a higher probability of observing a repurchase versus a dividend. A firm with less predictable cash flows or investment opportunities stands to benefit more from the ability to adjust its payout policy in response to unanticipated changes in cash flows or investment needs. Thus, under the flexibility hypothesis, greater variability of cash flow and/or greater imbalance between cash flow and investment needs are expected to be associated with a reduced probability of including an ASR in a repurchase program.

To the extent that a larger program authorization reflects an ex-ante intention to actually repurchase a substantial number of shares, all else equal, the marginal cost of the lost flexibility associated with an ASR will be lower for larger authorizations as the decision to repurchase these shares is less sensitive to changes in firm characteristics or the market for its shares. Thus, under the flexibility hypothesis, we would expect larger programs to be more likely to include an ASR.⁹

In summary, the flexibility hypothesis predicts that, all else equal, the costs of an ASR are greater for firms with greater stock price uncertainty, less stock market liquidity of its shares, less predictable cash flows, greater imbalance between cash flow and investment needs, and smaller program authorizations.

Many studies investigate the signaling motivation for repurchases, i.e., the notion that repurchases can be used to signal better future prospects or a willingness on the part of managers to distribute free cash flow to shareholders rather than overinvest (e.g., see Vermaelen, 1981). Regardless of the particular information being signaled, an ASR or a rapidly completed and verifiable OMR could serve to convey this information, albeit with a delay in establishing the credibility of the OMR. Including an ASR strengthens the credibility of the signal as shareholders do not have to wait to determine and verify the share purchases as they must with an OMR. The value of a stronger signal varies across firms. Presumably, a firm facing declining investment opportunities and generating large free cash flows or receiving a large non-recurring free cash flow would benefit more from a stronger signal of its commitment to return cash to shareholders (e.g., see Jensen, 1986; Grullon and Michaely, 2004). Similarly, firms that face greater undervaluation might view including an ASR in a program as strengthening this signal as well.

An ASR is also expected to increase the effectiveness of a repurchase program as a takeover defense. Bagwell (1991) demonstrates that a Dutch-auction repurchase decreases the likelihood of a takeover if the supply curve for shares is positively sloped (e.g., see Brown and Ryngaert, 1991). Also, Billet and Xue (2007) find empirical support for the role of repurchases as takeover defenses in a sample of OMRs. In this context, the inclusion of an ASR in a repurchase program increases the effectiveness of a program as a takeover defense because the ASR ensures the necessary number of shares is repurchased immediately. Therefore, the credibility and immediacy hypothesis predicts that an ASR is more likely in a repurchase program implemented to defend against a takeover (e.g., see Akyol, Kim, and Shekhar, 2009).

Firms can use a repurchase to adjust capital structure. Hovakimian, Opler, and Titman (2001) find that repurchases tend to increase firms' leverage ratios towards their "target" leverage ratios. If the benefit of a capital structure adjustment increases as the distance from the target level increases, then an ASR is more likely in firms that are further below their target leverage ratios because the effects of an ASR are more immediate.

Managers can use share repurchases to manipulate reported quarterly accounting information.¹⁰ In particular, managers whose bonuses are explicitly tied to EPS have an incentive to undertake repurchases to increase their expected bonuses (e.g., Cheng, Harford, and Zhang,

2009). With an ASR, the number of shares outstanding adjusts as soon as the shares are delivered to the firm by the intermediary, which occurs immediately after the ASR agreement is in place. With an OMR, the adjustment does not occur until the firm buys the shares in the market. As a result, an ASR has a larger impact on the average number of shares outstanding used in the calculation of the accounting ratios in the period in which it is undertaken. Thus, the decision to include an ASR in a repurchase program could be, in part, motivated by a desire on the part of managers to quickly manipulate earnings for the current period.

In summary, the credibility and immediacy hypothesis predicts that the benefits of enhanced credibility and immediacy of ASRs are larger for firms where the repurchases are motivated by a desire on the part of managers to: signal their willingness to return cash to shareholders in an expedited manner, signal undervaluation, defend against unwanted takeover attempts, increase leverage towards a target ratio, or manage reported earnings per share.

3. Sample Formation and Descriptive Statistics

3.1. ASR Sample

We search the U.S. Securities and Exchange Commission (SEC) Edgar database for any filing that mentions an accelerated share repurchase. The Edgar Full-Text searchable database includes a rolling window of the previous 4 years of SEC filings. Our initial search was conducted on October 2, 2007; hence, we obtained search results for all filings dated October 2, 2003 and later. We have continued to access the database quarterly to update the sample of ASRs. Given the rolling time window limitation of the Full-Text database, we also search Factiva for any newswire or business publication story that mentions an ASR in the period January 1996 through December 2008.¹¹ We corroborate news reports of ASRs by reviewing contemporaneous SEC filings and every ASR in our sample is definitively reported as such in an SEC filing.¹² Our search efforts identify a total of 256 distinct ASR transactions and we gather details about the transactions from filings, announcement stories, and actual ASR agreements.

Panel A of Table 1 details the number of ASR transactions announced in each year of the sample period. The earliest ASR in our sample was announced in 1997. The number of ASRs is very small for each year in the sample prior to 2004; however, the number of ASRs increases dramatically each year beginning in 2004 and reaches a high of 97 in 2007 before declining to 25 in 2008. Fig. 2 plots the ratio of ASRs to total repurchase programs announced for each year of the sample period as an approximate indication of how important ASR activity has become among repurchase programs. While not reported in Table 1, we observe at least one ASR in each of the 12 Fama and French (1997) industry classifications with financials, wholesale, and

business equipment the three most frequently represented industries.¹³

Panel B of Table 1 reports the transaction characteristics of the ASRs in our sample. The mean (median) deal size is \$530.55 (\$250.00) million which represents, on average, 5.3% of the outstanding equity of the firms at the time of the announcements. For reference, Grullon and Michaely (2004) report that, for the period 1980 through 1997, the average repurchase program authorization represents 6.8% of outstanding equity. Considering an ASR is generally only a portion of a repurchase program and is completed over a very short time frame in comparison with the OMR portion of the program, ASRs are clearly significant buyback events for firms. On average, the shares repurchased via each ASR comprise approximately 58.0% of the program authorization.

For the 93 transactions for which we are able to obtain information on the price per share paid to the intermediary at the initiation of the ASR, we compute the percentage difference between the price paid to the intermediary under the ASR agreement and the closing price of the stock on the previous trading day. The mean (median) percentage difference between the ASR agreement price and the previous closing price is 0.13% (0.00%). The vast majority of ASRs do not involve the intermediary receiving any significant premium or accepting any discount for the shares they initially deliver to the repurchasing firm. We are able to obtain the details of the settlement period for 178 of the ASRs in our sample, and the average settlement period was approximately 140 calendar days. In the 103 (71) instances where the intermediary made (received) a payment to (from) the repurchasing firm at settlement, the payment averaged \$54.2 (\$33.5) million. Approximately 42% of the contracts were settled in cash with the remainder settled in shares of the repurchasing firm. Finally, we note that 24% of ASRs in our sample included a cap, floor, or collar provision associated with the settlement terms. Panel C reports the stated motivations for our sample of ASRs. Approximately 31% of firms mention undervaluation as one of the motivations for the ASR transaction. The next most frequently stated motivation is the desire to alter capital structure.

3.2. Repurchase Programs

Our sample of repurchase program announcements is obtained primarily from the Securities Data Corporation (SDC) database on Mergers and Acquisitions. Initially, we consider programs announced between January 1996 and December 2008. We match each ASR with a repurchase program identified in SDC or via a search of Factiva.¹⁴ While 62 of the ASRs are announced simultaneously with a repurchase program, the remaining ASRs are announced after a program. Thus, we match each ASR with the program that immediately preceded the ASR

announcement. Our treatment of ASRs as part of repurchase programs is distinct from that of Chemmanur, Cheng, and Zhang (2010) and Marquardt, Tan, and Young (2009) who classify firms as strictly conducting OMRs versus ASRs. We note that this approach forces Chemmanur, Cheng, and Zhang to drop observations where firms announce repurchase programs on the same day or even in the same month as an ASR.¹⁵ The strict classification of firms as ASR versus OMR is not consistent with certain features of the data that reveal how ASRs are used by firms. For instance, nearly 25% of our sample ASRs are announced simultaneously with OMRs and the overwhelming majority of ASRs are announced within one year of an OMR program announcement which indicates that ASRs and OMRs are not pure substitutes in repurchase programs.

The 256 ASRs in our sample can be linked to 220 distinct repurchase programs announced by 177 unique firms. The average (maximum) number of ASRs by a firm in a particular repurchase program is 1.2 (3.0) and the average (maximum) number of ASRs by firm regardless of program is 1.3 (7.0).

4. Results

4.1. Univariate Comparisons

As reported in Table 1, nearly 95% of the ASRs in our sample were undertaken after 2003. Thus, we limit our sample period to 2004 through 2008 when analyzing ASR election to ensure that we are comparing firm characteristics over a period when ASRs are not rare events. Table 2 reports characteristics of repurchasing firms based on whether or not they elect to include an ASR in a repurchase program. Details on data sources and variable construction are provided in Appendix B. Independent variables constructed using financial statement data for programs that do not include ASRs and for ASRs that are announced simultaneously with a program are measured at the fiscal year end immediately prior to the program announcement. Independent variables for ASRs that are not announced simultaneously with a program, i.e., subsequent ASRs, are measured at the fiscal year end immediately prior to the ASR announcement.

ASRs require an intermediary to borrow a significant number of the repurchasing firm's shares. Thus, for firms whose securities are subject to binding short-sale constraints, including ASRs in their repurchase programs may not be feasible. As reported in Table 2, no firm conducted an ASR when, in the month prior to the announcement, its shares were identified as short-sale constrained. To ensure that we are comparing ASR election across firms for which an ASR is feasible, we restrict our analysis to those program announcements by firms that are not

short-sale constrained. This restriction excludes from the analysis 60 programs without ASRs.¹⁶

As an indication of the uncertainty regarding the value of a firm's shares, we calculate the standard deviation of daily stock returns prior to the repurchase announcement. ASR firms have less volatile share prices than non-ASR firms and the difference in means (medians) is highly significant as indicated by a *t*-test (Wilcoxon rank sum test). As an indication of the stock market liquidity of a firm's shares, we calculate the Amihud (2002) measure of illiquidity. As indicated in Table 2, firms not including ASRs in their repurchase programs have markets for their shares that are significantly less liquid (higher logarithm of illiquidity) than firms including ASRs in their programs.

Firms conducting ASRs tend to be larger relative to those firms that do not conduct ASRs. Somewhat surprisingly, firms including ASRs in repurchase programs have significantly smaller holdings of cash and marketable securities relative to assets and slightly lower levels of free cash flow relative to assets. However, firms electing to undertake ASRs have significantly less volatile free cash flows which may account for why these firms also hold less cash on their balance sheets since, all else equal, reduced uncertainty in cash flows would prompt firms to hold less cash as a precaution against unanticipated changes in cash flows (e.g., see Bates, Kahle, and Stulz, 2009).

A large positive correlation between a firm's cash flows and investment needs indicates that a firm generally has higher cash flows when investment needs are high and, hence, has less need for a hedging program to better align its cash flows and investment needs (e.g., see Froot, Scharfstein, and Stein, 1993). A large negative correlation would imply that the firm will not have free cash flow to invest when investment needs are high and, as such, the firm has a higher need for a hedging program to better align cash flow and investment needs. Firms conducting ASRs are significantly less frequently identified as having high hedging needs relative to those firms conducting repurchases comprised entirely of OMRs. This is consistent with firms avoiding ASRs when the correlation between their cash flows and investment needs is low. The frequency with which ASR versus non-ASR firms are identified as low hedging needs firms does not significantly differ across the two groups. Programs including ASRs have significantly larger program authorization amounts, as a percentage of outstanding equity, than programs not including ASRs.

Previous literature shows that firms generally experience significant negative performance prior to announcing OMR programs, a pattern that is evident in our sample of non-ASR programs as well. Interestingly, the average abnormal return prior to a firm announcing an ASR is indistinguishable from zero but significantly greater than for programs without ASRs,

perhaps consistent with ASRs being motivated by factors other than a desire to signal undervaluation.

Firms conducting ASRs have smaller mean and median market-to-book ratios but the differences are not statistically significant. We follow Rhodes-Kropf, Robinson, and Viswanathan (2005) in decomposing the natural logarithm of market-to-book into three components, which Rhodes-Kropf, Robinson, and Viswanathan refer to as firm, sector, and long-run. While we observe no significant differences between ASR and non-ASR firms in terms of firm-specific misvaluation relative to fundamental value or differences between valuations based on current versus long-run sector multiples, we do observe that non-ASR firms have significantly larger median but not mean measures of long-run growth options.

Approximately 24% of firms undertaking an ASR completed an asset sale in the prior 6 months compared with only 10% of firms not undertaking an ASR. Thus, it appears that the ASR decision is in part driven by a desire of managers to signal a willingness to return the proceeds of asset sales to shareholders in an expedited fashion. Consistent with an ASR being more likely when employed as part of a takeover defense, we find that firms conducting an ASR are significantly more likely to have been the target of a takeover attempt than firms not including an ASR in a repurchase program. ASR firms have higher debt ratios than non-ASR firms with the median (mean) difference across the two groups significant at the 1% (10%) level. ASR firms are not significantly farther below their “target” leverage ratios than non-ASR firms. Similar to Marquardt, Tan, and Young (2009), univariate comparisons reveal that firms conducting ASRs are more likely to base chief executive officer (CEO) bonuses on EPS, to have CEOs that are also chairmen, and to experience voluntary turnover of the CEO in the year following the ASR.

In sum, the univariate analysis reveals that firms including ASRs in their repurchase programs have less variable stock prices, greater stock market liquidity, greater firm size, less variable cash flows, less imbalance between cash flows and investment needs, larger program authorizations, better recent stock performance, more frequent recent asset sales and unsolicited takeover attempts, more frequent use of EPS as a basis for bonuses, more frequent CEO/chairmen, and more frequent post-repurchase voluntary turnover of the CEO than firms not including ASRs in their repurchase programs. Additionally, no short-sale constrained firms included ASRs in their repurchase programs. While the univariate results are informative and generally consistent with our hypotheses, the usual caveats about making inferences based on univariate comparisons apply. Thus, we next turn our attention to multivariate investigation of the choice to include an ASR as part of a repurchase program.

4.2. Logit Regressions of ASR Election

Table 3 reports the results of logit regressions explaining ASR election. The coefficients on the independent variables are reported along with their p-values based on robust standard errors clustered by firm. Year and industry dummies are also included in the regressions but, to conserve space, the coefficients are not reported.

As in the univariate tests, we limit the analysis in Table 3 to those programs announced by firms which are not short-sale constrained and to ASRs announced in 2004 or later. Other than short-selling its own shares, the key features of an ASR could be nearly duplicated by a repurchasing firm (especially if the firm were willing to forfeit 10b-18 “safe harbor” protection) with a large, easily verifiable, expedited OMR.¹⁷ Thus, the intermediary in an ASR functions as a proxy through which a firm can borrow its own shares and there is a relatively competitive market for providing this service.¹⁸ Thus, the only real “supply” hurdle a firm might face in conducting an ASR is if an intermediary cannot borrow the firm’s shares. Hence, by conducting our analysis on all programs except for those deemed short-sale constrained, we can reliably interpret the coefficients on the specifications below as reflecting how firms’ characteristics are associated with firms’ demand for an ASR, i.e., the net benefits to the firm of conducting an ASR.¹⁹

As reported in specification (1), firms with greater stock price volatility are significantly less likely to include ASRs as a part of their repurchase programs. Similarly, firms with less liquid markets for their shares are significantly less likely to undertake ASRs. Firms with larger program authorizations are significantly more likely to conduct ASRs. Taken together, these findings are consistent with the flexibility hypothesis.²⁰ As in the univariate analysis, the coefficient on Prior stock price performance is positive, indicating that ASRs are not announced subsequent to relatively poor performance as would be expected if ASRs were utilized to signal undervaluation. The negative coefficient on Ln(Market-to-book) can be interpreted as evidence that firms with declining growth options use ASRs to signal a commitment not to overinvest. The asset sale indicator enters with a positive and significant coefficient consistent with ASRs being motivated, in part, by the desire of managers to signal a willingness to pay out non-recurring cash inflows to shareholders. Firms that were the subject of recent takeover interest were also more likely to include an ASR as were firms that were further below their target leverage ratios. Lastly, none of the variables intended to reflect motive and opportunity to manage EPS via ASRs are significant. In sum, these results are consistent with the flexibility hypothesis and the credibility and immediacy hypothesis.

As an additional test of signaling undervaluation as a motive for ASRs, in specification (2), we replace the market-to-book ratio with its components. We find that M/B firm, the firm-specific

deviation from value, is negative and significant. Thus, consistent with an undervaluation motive for ASRs, firms that are subject to greater firm-specific undervaluation are more likely to undertake ASRs. Also, we find that firms with greater long-run growth opportunities are less likely to conduct ASRs.²¹

Next, we examine the characteristics of firms that announce a repurchase program and an ASR simultaneously. A simultaneous ASR might be an indication that, in light of the objective of the repurchase, enhanced credibility and immediacy are viewed as being particularly valuable. Specification (3) reports the results of a logit regression in which the dependent variable equals one for simultaneous ASRs. The sample excludes programs that include a subsequent ASR. As before, firms with greater stock price volatility and firms with less liquid markets for their shares are less likely to undertake simultaneous ASRs. All else equal, firms with larger authorizations, firms with better prior stock performance, firms with fewer growth opportunities, and firms facing the threat of a takeover are more likely to include simultaneous ASRs in their repurchase programs consistent with the benefits of credibility and immediacy being larger for these firms.

To gauge the economic magnitude of the estimates, we select the model in specification (1) of Table 3 and calculate the effect of changes in the explanatory variables on the implied probability of including an ASR in the repurchase program. We vary the explanatory variables, one at a time, from the 25th percentile level to the 75th percentile level for scalar variables and from zero to one for dummy variables. All other variables are held constant at their sample means. For the standard deviation of returns variable, the estimated probability of including an ASR in the repurchase program of the firm decreases from 11.6% to 4.4%. The corresponding estimates for the Ln(Illiquidity) variable are 17.3% to 3.2%. These results indicate that the probability of including an ASR in a repurchase program decreases sharply as the variability of a firm's share price or the illiquidity of its stock increases. Increasing the size of the program authorization corresponds to a change in the estimated probability of an ASR from 5.3% to 7.5%. As Ln(Market-to-book) increases, the estimated probability of an ASR decreases from 9.5% to 4.2%. As the distance from optimal leverage increases, the probability of ASR increases from 5.9% to 7.6%. Also, an increase in Prior stock performance corresponds to an increase in the probability of an ASR from 5.4% to 8.4%. Finally, for the takeover (asset sale) variable, the estimated probability of an ASR in the repurchase program increases from 6.3% to 18.0% (6.2% to 9.7%) as the variable changes from zero to one. Thus, the factors that are found to be statistically significant in the analysis above are also economically significant in the decision to include an ASR in a repurchase program.

4.3. Robustness and Additional Results

In unreported results, we find that the inverse relation between illiquidity and the likelihood of ASR inclusion is robust to alternative measures of illiquidity. Specifically, we consider three alternative measures: the natural logarithm of quoted spread calculated as the log of the ratio of the offer price minus the bid price to the trade price; the log of the effective spread as defined in Lee (1993); and the log of the price impact measure defined in Huang and Stoll (1996). We substitute these measures for $\text{Ln}(\text{Illiquidity})$ into the logit regression in specification (1) of Table 3. The resulting coefficients on the measures of illiquidity are -1.004, -1.240, and -1.077, respectively, and each is significant at the 1% level. Thus, greater illiquidity, as proxied for by any of the alternative measures, is associated with a decreased probability of including an ASR in a program.

In the results reported in Table 3, we place no restriction on how timely the ASR announcement is relative to the repurchase program announcement. When we rerun specification (1) of Table 3 excluding the 27 ASRs in our sample that are not announced within 365 days of a program, the results are very similar to those reported. Additionally, the results continue to hold for the sub-sample where regulated (financial and utility) firms are excluded. Given the upheaval in financial markets in 2008, we also repeated our analysis on the subsample of repurchase programs announced prior to 2008. The results are very similar to those reported in Table 3.

The analysis in Table 3 assumes a linear relation between ASR choice and our independent variables. To allow for nonlinearities, we mean center the variables found to be significant in specification (1) of Table 3 and include squared terms. The coefficients on the linear variables remain significant with the exception of $\text{Ln}(\text{Illiquidity})$, $\text{Ln}(\text{Assets})$, $\text{Ln}(\text{Market-to-book})$, and Leverage difference. The coefficient on squared illiquidity is negative and significant suggesting that the relation between illiquidity and the likelihood of an ASR is predominantly attributable to more illiquid firms. The coefficients on squared program size and squared leverage difference are also negative and significant. The coefficients on squared standard deviation of returns, squared log of assets, squared prior stock performance, and squared market-to-book are insignificant. The signs and significance of the other coefficients remain unchanged. We have also winsorized each of the continuous independent variables in Table 3 at their respective 1st and 99th percentiles. Results using the winsorized variables are nearly identical to those reported.

4.4. Fraction of Program Completed via ASR

While the preceding analysis investigates the decision to include an ASR in a repurchase program, we now turn our attention to the fraction of the authorized repurchase that is completed via ASR. Specification (1) of Table 4 reports the results of an ordinary least squares (OLS) regression where the dependent variable is the cumulative fraction of a program that is completed via ASRs and the regression is estimated over the sample of programs including ASRs.²² Many of the coefficients on the explanatory variables have differing signs and significance relative to those we observe in our logit models predicting an ASR. Thus, conditional on the inclusion of an ASR, the mechanism governing the fraction of the program completed via ASRs is in many ways different from that which governs the inclusion of an ASR.

To reconcile the OLS and logit results in a simple unconditional model, we estimate a multinomial logit model predicting which of three groups (no ASR, low ASR, and high ASR) a program will fall into. The low (high) fraction ASR group contains those programs where the cumulative fraction of the program completed via ASRs is less than or equal to (greater than) 50%. Specification (2) reports coefficients for no ASR vs. low fraction ASR. The results indicate that the factors determining the relative likelihood of observing a low fraction ASR rather than no ASR are quite similar to those we find above when predicting the inclusion of an ASR. Interestingly, the coefficients on EPS bonus and Voluntary turnover are positive and significant at the 10% level, perhaps consistent with managers undertaking low fraction ASRs in an effort to “borrow a penny” to increase their bonuses ahead of a voluntary turnover (e.g., see Marquardt, Tan, and Young, 2009). Taken together, the results from specification (2) indicate that our flexibility and credibility and immediacy variables are significantly related to the decision to take on ASRs that in total account for less than 50% of a program authorization.

Specification (3) reports coefficients for no ASR vs. high fraction ASR. In addition to standard deviation of returns and illiquidity, the high hedge indicator is negative and significant and the standard deviation of cash flows is negative but not quite significant at conventional levels (p -value of 0.115). Consistent with the predictions of the flexibility hypothesis, these results indicate that proxies for the value of flexibility are important determinants of firms’ decisions to conduct high fraction ASRs. The positive and significant coefficient on the asset sale indicator suggests that firms use high fraction ASRs as vehicles to return the proceeds from asset sales to shareholders. The positive but not quite significant coefficient on Leverage difference hints at high fraction ASRs also being partly motivated by a desire to move towards a target leverage ratio. Also, as evidenced by the negative and significant coefficient on EPS bonus, managers do not appear to undertake high fraction ASRs to enhance their bonuses,

perhaps consistent with ASRs being effective tools for modest earnings management but not for dramatically altering reported EPS. Taken together, these results indicate that the factors determining the relative likelihood of observing a high fraction ASR rather than no ASR are similar to those we find above when predicting the inclusion of an ASR.

Specification (4) reports coefficients for low vs. high fraction ASRs. The results indicate that the factors associated with the likelihood of including low fraction rather than high fraction ASRs are somewhat different than the factors that determine the choice between an OMR-only program and a program including an ASR. The coefficients on illiquidity and standard deviation of returns are not significant. However, firms with greater standard deviation of cash flows or greater imbalance between cash flows and investment needs are less likely to conduct high fraction ASRs, consistent with the flexibility hypothesis. The coefficient on asset sale in specification (4) is positive, consistent with firms more frequently choosing high fraction ASRs subsequent to asset sales; however, the coefficient is not significant at conventional levels. Firms are significantly less likely to undertake high fraction ASRs relative to low fraction ASRs when managers' bonuses are tied to EPS, which suggests that low fraction ASRs are preferable for the purposes of increasing reported EPS.

Taken as a whole, our evidence on the fraction of programs completed via ASRs presents a picture whereby factors that we associate with flexibility, credibility, and immediacy are associated with the decision to undertake either low or high fraction ASRs. However, the decision to undertake high fraction ASRs relative to low fraction ASRs appears to be less clearly driven by these factors.

4.5. Why Do ASRs Decline in 2008?

Fig. 2 reveals that the ratio of ASR announcements to repurchase program announcements increases from 2004 through 2007 and then drops sharply in 2008.²³ To investigate whether our model of ASR choice explains the sharp drop in ASRs, we estimate the probability of including an ASR for each firm that announces a repurchase program. Specifically, we estimate the coefficients of specification (1) in Table 3 based on the 2004–2007 data. We use the coefficient estimates to predict the probability of an ASR for the in-sample programs in 2004 through 2007 and the out-of-sample programs in 2008. We define an indicator variable, Predicted ASR, that is equal to one if the estimated probability is above a specified threshold and zero otherwise. Because the unconditional probability of an ASR for the in-sample firms is 16.96%, we define the threshold as the in-sample 83.04th percentile of Predicted ASR. The resulting threshold probability is 32.90%. Therefore, Predicted ASR equals one if the estimated

probability of including an ASR in a repurchase program is greater than 32.90% and zero otherwise. The predicted and observed percentages of ASRs for each year are reported in Table 5. Strikingly, the predicted (observed) percentage drops sharply from 23.0% (20.6%) in 2007 to 13.4% (6.4%) in 2008. The results suggest that the decrease in ASRs in 2008 is to a large degree due to changes in the characteristics of repurchasing firms.

As an out-of-sample test of the validity of our predictions, we divide the 2008 repurchase programs into three groups based on the estimated probability of an ASR. Within each tercile, we total the number of ASRs observed. The totals, listed from the lowest third to the highest third, are one, three and 15 respectively. A Pearson chi-squared test rejects the hypothesis that the proportion of ASR firms is the same in each tercile with a p-value of 0.000. This suggests that our ASR model has significant power, out-of-sample, to predict which firms will include ASRs in their repurchase programs.

4.6. ASRs Relative to Other Repurchase and Payout Methods

While we characterize ASRs relative to OMR-only programs in the analysis above, other repurchase and payout methods are potential alternatives to ASRs. Thus, we investigate whether firms' decisions to conduct ASRs are associated with their past or concurrent use of alternative repurchase or payout methods. Fig. 3 reports the annual frequency of ASRs, fixed-price self-tender offers, Dutch-auction self-tender offers, privately negotiated repurchases, and large special dividends (defined as greater than 5% of the market value of equity). The frequency of ASRs first exceeds fixed-price self-tenders and Dutch-auction self-tenders (privately negotiated repurchases) in 2004 (2005) and continues to exceed the respective types of repurchases through 2008. ASR frequency first exceeds large special dividends in 2005 and continues to exceed large specials until 2008 when large specials again become more frequent than ASRs.

Visual inspection of Fig. 3 suggests that aggregate ASR frequency in recent years is positively correlated with that of the alternatives other than perhaps privately negotiated repurchases. It should also be noted that there are important distinctions between ASRs and the alternatives included in the figures. Thus, we consider below the relative choice of ASRs versus the various alternatives in light of these differences.

In contrast to ASRs, Peyer and Vermaelen (2005) show that most privately negotiated repurchases are announced after the transaction with no intent by the firm to repurchase more shares. Also, only about 109 out of 737 transactions in their sample are conducted at market prices with the majority involving a premium (greenmail) or discount. Further, the zero premium

deals are typically repurchases from insiders who exercise options and prefer to sell their shares to the firm. Nonetheless, we include dummy variables in specification (1) of Table 3 indicating, respectively, whether a firm had completed a privately negotiated repurchase in the 3 years prior to the program announcement or in the one year after the program announcement. In short, neither dummy enters the regression significantly suggesting that, at the firm level, ASRs serve a unique role relative to privately negotiated repurchases.

Note that while tender offer repurchases, like ASRs, are credible commitments to repurchase and can be completed relatively quickly, tender offer repurchases (both fixed-price and Dutch-auction) nearly always result in selling shareholders receiving significant premiums (e.g., see Comment and Jarrell, 1991). As an indication of whether or not ASRs are substituting for tender offer repurchases, we include dummy variables in specification (1) of Table 3 reflecting whether a firm had completed a fixed-price tender offer or a Dutch-auction repurchase, respectively, in the 3 years prior to the program announcement or the one year after the program announcement. In the specification including the Dutch-auction dummies, neither of the dummies is significant. In the specification including the fixed-price dummies, the variable reflecting prior fixed-price repurchase activity is positive and significant at the 10% level. Further, we note that no firm that conducted an ASR in a program also conducted a fixed-price tender offer in the same program (which makes including the dummy for concurrent fixed-price offers infeasible). This outcome could be interpreted as indicating ASRs are perfect substitutes for fixed-price repurchases or that ASRs and fixed-price repurchases are used to achieve entirely different objectives. Given the large premiums conveyed in fixed-price repurchases and the absence of any premium in ASRs, the latter interpretation seems more likely. Thus, taken together, these results suggest that ASRs serve a unique role relative to self-tender offers.

On a continuum of the credibility of commitment among payout types, it could be argued that ASRs would lie near declaring a large special cash dividend (e.g., see DeAngelo, DeAngelo, and Skinner, 2000). Thus, we create dummy variables indicating whether a firm had completed a large special dividend in the 3 years prior to the program announcement or the one year after the program announcement. In short, no firm that paid a large special dividend also undertook an ASR. Given that large specials are often issued as part of major corporate restructurings (average payout of 17.3% of the market value of equity over 2004–2008) whereas ASRs (average 5.3% of the market value of equity over 2004–2008) are not, this suggests that the objectives for these respective transactions differ substantially. As a further indication, we create dummy variables reflecting whether a firm had issued any special dividend in the 3 years prior to the program announcement or the one year after the program announcement. Neither dummy

enters the regression significantly suggesting that ASRs serve a unique role relative to special dividends.

In sum, ASRs appear to represent an important innovation relative not only to OMR-only programs, but also to alternative payout methods like self-tender offers, privately negotiated repurchases, and large special dividends. It does not appear that ASRs are simply substituting for alternative payout methods. Thus, our characterization of the choice to include an ASR as being relative to an OMR-only program appears to accurately reflect how ASRs are used in practice.

4.7. Abnormal Returns Analysis

Table 6 reports the abnormal returns for the repurchase announcements in our sample. We calculate the 3-day cumulative abnormal returns (CARs) in the window -1 to +1 in trading days relative to the repurchase announcement. CARs are calculated using the standard event-study methodology (e.g., see Brown and Warner, 1980). The parameters of the market model are estimated over 255 trading days, ending 46 days prior to the announcement using the Center for Research in Security Prices (CRSP) value-weighted index as the market portfolio and requiring a minimum of 100 trading days over the estimation window.

ASR announcements are met with positive and significant abnormal returns.²⁴ Further, ASRs announced subsequent to repurchase programs are also associated with positive and significant abnormal returns consistent with shareholders viewing these transactions as incrementally wealth increasing relative to the previously announced repurchase programs. With the exception of the median returns to programs associated with subsequent ASRs, the mean and median returns for all program announcements are positive and significantly different from zero at the 5% level. Additionally, with the exception of programs associated with subsequent ASRs, positive announcement returns are significantly more frequent than negative announcement returns for all groups as indicated by sign tests. The evidence suggests that, on average, ASR announcements and program announcements are value-increasing events. We further find that the mean (median) return of 1.70% (2.01%) for programs announced simultaneously with ASRs is not significantly different than the mean (median) return of 1.46% (1.21%) for program announcements not associated with any ASR.

Within the context of the credibility and immediacy hypothesis, a plausible objective for undertaking an ASR after a program has already been announced is that the response to the program announcement was weak and the firm wants to send a more credible signal. If this is the case, then we would expect program announcements associated with subsequent ASRs to have

lower announcement returns than program announcements not associated with any ASR. We investigate the validity of this conjecture for the pattern of returns by testing the differences across the two groups. The mean and median returns to programs without ASRs are larger than those for programs with subsequent ASRs with the differences between the median returns significant at the 5% level. Thus, the results of the univariate tests suggest that a lower return at program announcement may be a factor in a firm's election to conduct a subsequent ASR.

In Table 7, we analyze ASR announcement returns in a multivariate setting. The dependent variable in specifications (1) and (2) is the 3-day cumulative abnormal return around the ASR announcement, the sample is all ASR announcements from 2004 to 2008, and we include all of the independent variables considered in the logit regressions of Table 3 as well as the percentage of the firm's outstanding equity that is repurchased in the ASR. Larger ASRs, as a fraction of the firm's outstanding equity, are associated with greater announcement returns. Insofar as larger ASRs send stronger signals, this result supports the credibility and immediacy hypothesis. Prior stock performance is significantly negatively associated with announcement returns. ASRs announced when firms are targets of takeover attempts are met with lower abnormal returns, perhaps owing to the reduced likelihood that the proposed acquisitions will be completed in light of the ASRs.

In specification (2), we split $\text{Ln}(\text{Market-to-book})$ into three components as in Rhodes-Kropf, Robinson, and Viswanathan (2005). The coefficient on firm-specific undervaluation is positive and marginally significant. However, each of the other two components is statistically insignificant.²⁵ Further, the market-to-book ratio in specification (1) along with the uncertainty in returns, the illiquidity of the firm's shares, and the size of the program authorization in both specifications are not significantly related to the returns. Given these characteristics are significant in Table 3, it appears that firms consider them when deciding to include an ASR such that differing values of the characteristics themselves are then unrelated to announcement returns.²⁶

Specification (3) reports the results of a logit regression where the dependent variable takes a value of one if a firm announced an ASR subsequent to announcing a repurchase program and zero if the program was not associated with an ASR. We include the market response to the repurchase program announcement as an independent variable. The significantly negative coefficient on the program announcement return is consistent with an ASR being a mechanism to send a more credible signal to the market after a relatively weak response to the program announcement.

The univariate analysis in Table 6 suggests that announcement returns to programs

including simultaneous ASRs are not distinguishable from the returns to programs without ASRs. In specification (4) of Table 7, we test this in a multivariate setting. The sample for this test excludes programs that include a subsequent ASR. We regress the 3-day cumulative abnormal return for program announcements on our basic control variables and a variable indicating that the program includes a simultaneous ASR. Consistent with the univariate results, the coefficient on the simultaneous ASR indicator variable is not significant.

Finally, in specification (5), we test whether the announcement returns to programs associated with any ASR differ from the returns to programs that are not associated with ASRs. For programs not associated with an ASR, the dependent variable in the regression, Combined CAR3, is the abnormal return at the program announcement. For programs associated with an ASR, the dependent variable is the sum of the abnormal returns at the program announcement and the abnormal returns for any subsequent ASRs conducted within the program. The indicator variable ASR is equal to one for a program that is associated with a simultaneous or subsequent ASR and zero otherwise. The insignificant coefficient on the ASR indicator variable suggests that the combined announcement returns for programs associated with at least one ASR are no different than the announcement returns for programs not associated with an ASR.

5. Conclusion

This paper investigates ASRs, a recent and important innovation in share repurchase transactions, relative to both open market repurchases and other alternative methods of distributing excess cash to shareholders. ASRs are credible commitments by firms to repurchase shares immediately. Including an ASR in a repurchase program reduces the flexibility that firms have to alter an announced program in response to subsequent changes in the liquidity and price of its stock, firm conditions, etc. However, ASRs provide the benefits of enhanced credibility of commitment and immediate execution. Thus, we investigate whether firms' decisions to include ASRs in their repurchase programs are associated with factors expected to influence the costs of lost flexibility and the benefits of enhanced credibility and immediacy.

We find that the choice to undertake an ASR is significantly negatively associated with proxies for the costs of lost flexibility. We also find that firms are more likely to undertake ASRs in situations where the benefits of credibility and immediacy are larger. Further, our ASR model has significant power, out-of-sample, to predict which firms will include ASRs in their repurchase programs. We also show that ASR announcements are associated with positive and significant average abnormal returns. This result holds for ASRs announced simultaneously with a repurchase program and ASRs announced subsequent to the repurchase program

announcement. These results suggest that ASRs are, on average, value-increasing events and add incremental value when announced subsequent to a repurchase program announcement.

Appendix A. Common Provisions in ASR Contracts

Based on our review of 119 ASR agreements, we describe below the most common contractual provisions included in the agreements, e.g., see <http://www.sec.gov/Archives/edgar/data/354869/000095015206000339/118060aexv99w1.htm>

Standard provisions of ASR agreements:

- Date on which the intermediary will deliver the initial shares to the firm.
- Number of initial shares the intermediary will borrow and deliver.
- Price the firm will pay the intermediary for each initial share delivered.
- Time period in which intermediary will purchase shares to cover its short position.
- Time period over which the settlement price will be calculated.
- Define volume weighted average price (VWAP) per share over specified period using only trades that qualify under SEC Rule 10b-18(b), i.e., excluding trades at the opening and during the last 30 minutes of the trading session (or last 10 minutes for liquid stocks) and trades where price exceeds the highest independent bid or the last independent transaction price.
- Calculate settlement price as VWAP minus a discount to compensate firm for opportunity cost of full prepayment for initial shares when intermediary actually acquires these shares (closes its short position) over a period of several months.
- Define cap or floor, if any, for the settlement amount.
- Rights of each party to determine the method of settlement, i.e., cash or shares.
- Provisions to reimburse the intermediary for costs incurred if they receive primary shares at settlement, e.g., private placement agreement, discount at resale, etc.
- Stipulations for altering the agreement based on regular and extraordinary dividends, merger announcements, market disruptions, etc.
- Requirement that firm must use the intermediary to repurchase any shares between ASR initiation and settlement.
- Statement that firm will not attempt to evade SEC Rule 10b5-1 (insider trading) and will not seek to control or influence the intermediary's purchases or sales.
- Statement that the firm will give the intermediary written notice of a distribution of shares relating to Internal Revenue Service Regulation M.

- Reference definitions in the 2002 International Swaps and Derivatives Association (ISDA) Equity Derivatives Definitions.

Non-standard provisions of ASR agreements, in approximate order of most frequently observed to least frequently observed:

- Stipulate a maximum or minimum number of shares to be repurchased.
- Specify a maximum cost (basis points per annum) that the intermediary is willing to incur to borrow the firm's shares.
- Specify a per share brokerage fee to be paid to the intermediary for initial shares.
- Specify an up-front fee to be paid to the intermediary.
- Define multiple delivery dates for the initial shares.
- Define intermediate settlement dates.

Appendix B. Data Sources and Variable Construction

Stock price, volume of trade information, and financial statement data are obtained from the merged Center for Research in Security Prices (CRSP) and Compustat databases. Asset sale and takeover data are obtained from SDC. Managerial compensation data are obtained from proxy statements.

Short-sale constrained: We follow Diether and Werner (2008) and calculate the imputed loan fees that a short-seller would have to pay to a lender. Imputed loan fees are calculated each month for all firms on NYSE and Amex as $-0.009 \times \text{the natural log of market equity} - 0.021 \times \text{the natural log of book-to-market} - 0.308 \times \text{the return in month } t-1 - 0.177 \times \text{the return over months } t-12 \text{ to } t-2 - 0.494 \times \text{institutional ownership as a fraction of shares outstanding} - 0.049 \times \text{natural log of stock price} + 0.219 \times \text{natural log of turnover} + 3.357 \times \text{standard deviation of daily returns over the prior 12 months} - 0.096 \times \text{natural log of one plus the number of analysts} + 30.474 \times \text{risk free rate} + 1.925$. We calculate loan fees for Nasdaq firms using the same variables but with Nasdaq-specific coefficients. If the imputed loan fee in the calendar month prior to the repurchase announcement is greater than the 90th percentile for all stocks on the same exchange over all months in the period 2002–2008, then we code Short-sale constrained to equal one, otherwise it is equal to zero.

Std. dev. returns: We calculate standard deviation of daily stock returns for the period starting 255 trading days prior to the repurchase announcement and ending 46 trading days prior to the repurchase announcement, where day 0 is the date on which the repurchase program is announced or the day the ASR is announced if the program included an ASR (and the ASR was

not announced simultaneously with the program).

Illiquidity: Amihud (2002) defines illiquidity as the 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, or the daily price impact of the order flow. We average daily illiquidity for each firm over the period starting 255 trading days prior to the repurchase announcement and ending 46 trading days prior to the repurchase announcement. To minimize the influence of extreme values, we use the natural logarithm of illiquidity in our tests.

Assets: Assets is book value of total assets (Compustat item 6).

Cash/assets: Cash/assets is the ratio of cash and short-term securities (item 1) to total assets.

Free cash flow: We follow Acharya, Almeida, and Campello (2007) and measure free cash flow by subtracting the sum of depreciation (item 14), tax payments (item 16), interest expense (item 15), and dividends (sum of items 19 and 21) from gross operating income (item 13) and scaling the difference by total assets.

Std. dev. free cash flow: Standard deviation of free cash flow is calculated over the 5-year period preceding the repurchase or ASR announcement. We require a minimum of three consecutive years of operating income to calculate standard deviation of free cash flow.

High-hedge, Low-hedge: We follow Acharya, Almeida, and Campello (2007) and create indicator variables to classify firms into groups based on the sign and magnitude of the correlation between cash flow and investment needs as proxied for by the correlation between a firm's free cash flow and the median research and development (R&D) expenditures of its industry (defined at three-digit Standard Industrial Classification (SIC) level) for the 3 years preceding the ASR or repurchase program announcement. High-hedge takes a value of one if a firm's correlation between cash flow and investment needs is less than -0.2 and zero otherwise and Low-hedge takes a value of one if the firm's correlation coefficient is greater than 0.2 and zero otherwise.

Program percentage of equity: Program percentage of equity is the percentage of outstanding equity that the program authorizes for repurchase.

Prior stock performance: Prior stock performance is the cumulative abnormal return over the period starting 44 trading days prior to the announcement and ending 4 days prior to the announcement, as in Kahle (2002).

Market-to-book: Market-to-book is the ratio of market value of assets (common shares outstanding (item 25) times calendar year closing price (item 24) plus total assets (item 6) minus common equity (item 60) minus deferred taxes (item 74)) to book value of assets (item 6).

M/B firm, M/B sector, and M/B long-run: We follow Rhodes-Kropf, Robinson, and Viswanathan (2005) in decomposing the market-to-book ratio into three components. The first component, M/B firm, captures the difference between the observed price and a valuation measure that reflects current sector [Fama and French (1997) 48 industries] fundamentals. It is the difference between market value and fundamental value conditional on time and sector valuation effects and captures “purely firm-specific deviations from fundamental value.” The second component, M/B sector, captures the difference between valuation based on current sector fundamentals and valuation based on long-run sector fundamentals. The third component, M/B long-run, captures the difference between valuation based on long-run sector fundamentals and book value. M/B long-run is thus a proxy for long-run growth opportunities. We use the time period between 1996 and 2008 to calculate long-run values for different sectors.

Asset sale: Asset sale is a dummy variable that takes a value of one if a firm completed an asset sale in the 6 months prior to the announcement of the repurchase program or ASR.

Takeover: Takeover is a dummy variable that takes a value of one if a firm was the target of a takeover attempt in the 6 months preceding the announcement of its repurchase program or ASR.

Leverage: Leverage is long-term debt (item 9) plus debt in current liabilities (item 34) divided by the sum of long-term debt, debt in current liabilities, and market value of equity.

Leverage difference: Leverage difference is defined as a firm’s target leverage minus its actual leverage. Target leverage is estimated as in Flannery and Rangan (2006). Target leverage is the predicted value obtained by regressing the debt of all firms in Compustat between 1995 and 2008 on firm-level explanatory variables including EBIT scaled by total assets, market-to-book, depreciation scaled by assets, log of assets, value of property, plant, and equipment scaled by total assets, R&D expenses scaled by assets, lagged industry median debt ratios, and a bond rating indicator variable.

EPS bonus: EPS bonus is a dummy variable that takes a value of one if earnings per share is explicitly mentioned in the firm’s proxy statement as one of the determinants for the bonus plan of the chief executive officer (CEO) and zero otherwise.

Chairman of the board: Chairman of the board is a dummy variable that takes a value of one if the CEO of the firm is also the chairman of the board of directors and zero otherwise.

Voluntary turnover: The indicator variable Voluntary turnover is equal to one if the CEO is at least 60 years old based on the proxy statement preceding the program announcement and is no longer the CEO at the time of the first proxy statement at least one year after the program announcement.

Notes

3. For a review of the payout literature, see Allen and Michaely (2003).
4. The Financial Accounting Standards Board's Emerging Issues Task Force (EITF) has, by consensus, agreed that an entity should account for an accelerated share repurchase as two separate transactions: (a) as shares of common stock acquired in a treasury transaction recorded on the acquisition date and (b) a forward contract indexed to its own common stock. See EITF Issue no. 99-7 "Accounting for an Accelerated Share Repurchase Program." Also, see Dickinson, Kimmel, and Warfield (2008) for the accounting consequences of ASRs.
5. For example, H.B. Fuller Co. announced in 1996 that, "Terms of the program allow the company to make such purchases from time to time at prevailing prices in the open market, by block purchase or in private transactions." H.B. Fuller Co. announced in 2007 that, "Under the program, the Company, at management's discretion, may repurchase shares for cash on the open market from time to time, in privately negotiated transactions or block transactions, or through an accelerated repurchase agreement."
6. As evidenced by the cross-sectional variation in both the amount and timing of actual repurchased in OMR programs, e.g., see Stephens and Weisbach (1998) and Cook, Krigman, and Leach (2003), firms clearly utilize this flexibility.
7. The standard language used to announce OMR programs justifies any actual repurchase outcome from zero to 100% of the total authorization, e.g., IRIS International's 2008 announcement notes that, "The timing and actual number of shares repurchased will depend on a variety of factors including the common share price, corporate and regulatory requirements and other market and economic conditions. The share repurchase program may be suspended or discontinued at any time."
8. Verifying repurchases of shares has become easier in recent years at the U.S. Securities and Exchange Commission (SEC) has required, since December 2003, that all U.S.-listed firms report monthly volume and price data on their repurchase activity in their quarterly filings (see Purchases of Certain Equity Securities by Issuers and Others, Exchange Act Release no. 33-8335 at <http://www.sec.gov/rules/final/33-8335.htm>).
9. There are other reasons that we might expect larger programs to be more likely to include ASRs. For instance, an OMR-only program requires managers to devote time and attention to deciding whether or not to repurchase each day and at which price to repurchase. Thus, ASRs may free management from some of the demands on their time associated with administering OMRs. Additionally, replicating the credibility and

immediacy of an ASR is more difficult as the size of the repurchase program increases. Therefore, larger programs require more time to complete, thus delaying both the direct effects of the repurchase and the verification of the extent of the firm's intention to repurchase shares. Lastly, any fixed costs associated with ASRs could also explain an increased likelihood of including an ASR in larger programs.

10. See, for example, Hribar, Jenkins, and Johnson (2006), Bens, Nagar, Skinner, and Wong (2003), and Brav, Graham, Harvey, and Michaely (2005).
11. Keywords for the Edgar search were: accelerated share repurchase OR accelerated share buyback OR accelerated stock buyback or accelerated stock repurchase OR accelerated equity buyback OR accelerated equity repurchase OR overnight share repurchase OR overnight share buyback OR overnight stock buyback OR overnight stock repurchase OR overnight equity buyback OR overnight equity repurchase. The search terms for the Factiva search were: “(accelerated or overnight) and (share or equity or stock) and (repur* or buyback or buy-back or buy back)”.
12. It is necessary to confirm ASR transactions in SEC filings since the news search results often include announcements by firms that they are “accelerating” their repurchases. For example, Microsoft’s \$19 billion repurchase in 2005 is not an ASR. Microsoft announced (as do a number of other firms over the sample period) that they were accelerating the pace of their repurchases, i.e., increasing the frequency of their open market repurchases to speed completion of an OMR-only program.
13. We thank Ken French for the use of his industry definitions which may be obtained from his Web site at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/changes_ind.html.
14. A total of 154 of the 220 distinct program announcements associated with ASRs are from SDC. We identify the remaining program announcements via searches in Factiva.
15. There are several other important differences between Chemmanur et al.’s (2010) sample formation procedure and ours. 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.
16. When we include the 60 programs for which the firms’ shares were short-sale constrained, the results of specification (1) of Table 3 are very similar. Further, when we vary the

short-sale constrained cutoff from the 90th percentile to the 85th or 80th percentile, we obtain very similar results to those reported. We have also conducted the analysis on the subsets of repurchase programs where all firms were required to have a minimum of 10% institutional ownership or to not have been subject to failures to deliver relative to outstanding shares greater than the 90th percentile for all firms over the same period. In both cases, the results are similar to those reported indicating that the reported results are robust to the choice of proxy for short-sale constraints.

17. For an open market repurchase to qualify for “safe harbor” protection, a firm must satisfy the four criteria detailed in the SEC rule 10b-18 anti-manipulation guidelines. These four criteria are: (1) on any one day, firms may not purchase more than 25% of the average daily trading volume of their own shares during the prior 4 weeks, block trades and privately negotiated transactions are exempt from this guideline; (2) firms may not purchase their own shares in the opening and closing one-half hours of trading; (3) firms may not purchase their own shares at a price higher than the last independent bid, or the last reported sale price; and (4) all purchases on a single day must be executed through the same brokerage firm. This rule was adopted in November 1982. An ASR does not qualify for “safe harbor.”
18. We are able to identify the intermediary for 191 ASRs. We document a total of 15 distinct investment banks serving as ASR intermediaries. The market for ASR intermediaries appears fairly competitive with a Herfindahl Index of 1,322 (1,374) based on the number (dollar value) of transactions.
19. This approach is similar to that taken in other repurchase contexts utilizing an intermediary, e.g., self-tender offers as in Lie (2002). Further, this approach is often taken in much of the literature examining securities issuance where the role of the intermediary (underwriter) is less mechanical, e.g., initial public offerings as in Pagano, Panetta, and Zingales (1998) and seasoned equity offerings as in Gao and Ritter (2010).
20. The correlations of Std. dev. returns with Ln(Illiquidity) and Std. dev. free cash flow are 0.33 and 0.28, respectively. The correlation between Ln(Illiquidity) and Std. dev. free cash flow is 0.07. While each of the correlations is significant at the 1% level, the respective variables enter the regressions with the same sign and significance level if included separately or in combination. Further, the variance inflation factors for these three variables are not larger than 4.89 for the ASR election regressions.
21. In unreported results, we used alternative measures of undervaluation calculated as in Purnanandam and Swaminathan (2004) and Chemmanur et al. (2010). In short, of the six

alternative measures, two (multiples based on earnings before interest, taxes, depreciation, and amortization (EBITDA)) entered the regression with a negative coefficient significant at the 10% level. Thus, these results appear sensitive to the algorithm used to estimate misvaluation and the particular measure employed. These results are available from the authors upon request.

22. If the factors governing the inclusion of an ASR in a program are quite different from those which govern the fraction of the program completed via ASR, then a Tobit model of fraction completed via ASR is inappropriate. Using the test outlined by Greene (1993, p. 701), we are able to formally examine whether the Tobit model should be rejected in favor of two separate models of the presence of an ASR and the fraction completed via ASR conditional on observing one. Using the explanatory variables from specification (1) of Table 3, this test provides strong evidence in favor of rejecting the Tobit model ($w=205.2$), indicating that the mechanisms governing the inclusion of ASRs and the fraction of programs completed via ASRs are quite different.
23. Note that no ASRs were announced during the period in September 2008 when the SEC banned short-selling in the stocks of 799 financial firms.
24. When we cannot get an exact ASR announcement date from a newswire report, we use as the announcement date the first day the information appears to be available to the public, i.e., the filing date of 10-K or 10-Q in which the ASR was first disclosed. We use a filing date in 36 instances (of 256 total ASR announcements). Given potentially confounding information in filings, we assess the robustness of our returns results to the exclusion of these observations. The results are very similar to those reported.
25. In unreported results, we used alternative measures of undervaluation calculated as in Purnanandam and Swaminathan (2004), and Chemmanur, Cheng, and Zhang (2010). The only significant coefficient of these six alternative measures is the coefficient on the price-to-valuation ratio based on a price-to-sales multiple calculated as in Chemmanur, Cheng, and Zhang (2010). However, this coefficient is positive and significant, the opposite of what we would expect if greater undervaluation is associated with greater announcement returns to ASRs. These results are available from the authors upon request.
26. In unreported results, we have added indicator variables for the stated motivations for the ASRs as independent variables in specification (1) of Table 7. None of the coefficients on the indicator variables enter significantly.

References

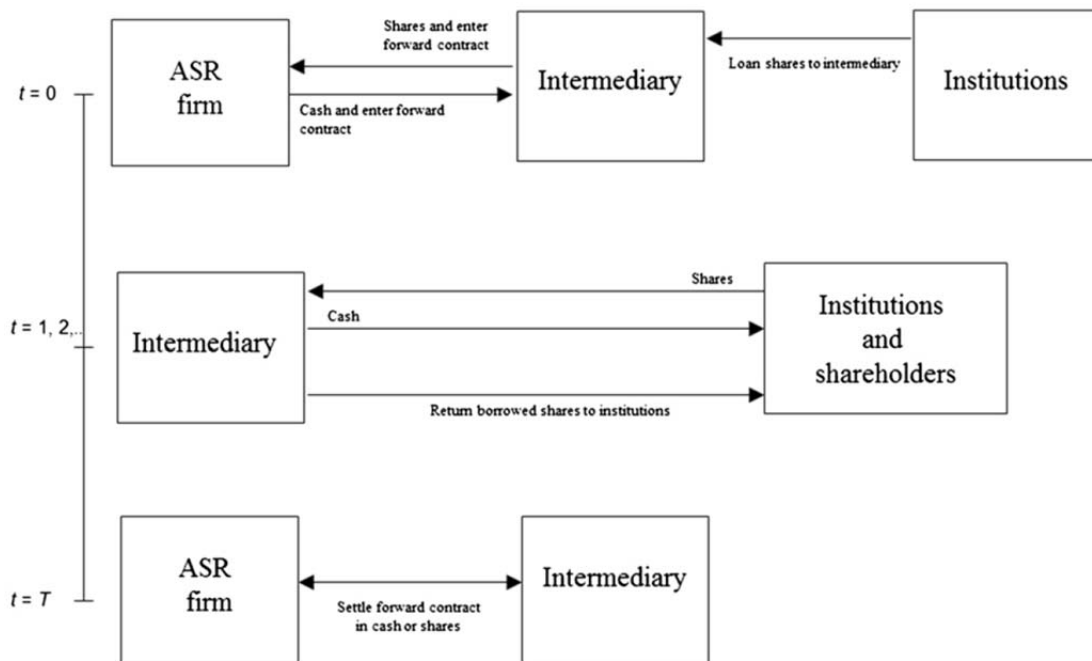
- Acharya, V., Almeida, H., Campello, M., 2007. Is cash negative debt? A hedging perspective on corporate financial policies. *Journal of Financial Intermediation* 16, 515–554.
- Akyol, A., Kim, J., Shekhar, C., 2009. Do accelerated stock repurchases deter takeovers? An empirical analysis. Unpublished working paper, University of Melbourne and Winston-Salem State University.
- Allen, F., Michaely, R., 2003. Payout policy. In: Constantinides, G., Harris, M., Stulz, R. (Eds.), *Handbook of the Economics of Finance*, vol. 1a. Elsevier Science, North-Holland, pp. 337–429 Chapter 7.
- Amihud, Y., 2002. Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 5, 31–56.
- Bagwell, L., 1991. Share repurchase and takeover deterrence. *RAND Journal of Economics* 22, 72–88.
- Barclay, M.J., Smith, C.W., 1988. Corporate payout policy: cash dividends versus open market share repurchases. *Journal of Financial Economics* 22, 61–81.
- Bates, T., Kahle, K., Stulz, R., 2009. Why do U.S. firms hold so much more cash than they used to? *Journal of Finance* 64, 1985–2021.
- Bens, D.A., Nagar, V., Skinner, D.J., Wong, M.H., 2003. Employee stock options, EPS dilution, and stock repurchases. *Journal of Accounting and Economics* 36, 51–90.
- Billet, T.B., Xue, H., 2007. The takeover deterrent effect of open market share repurchases. *Journal of Finance* 42, 1827–1850.
- Brav, A., Graham, J., Harvey, C., Michaely, R., 2005. Payout policy in the 21st century. *Journal of Financial Economics* 77, 483–527.
- Brockman, P., Howe, J., Mortal, S., 2008. Stock market liquidity and the decision to repurchase. *Journal of Corporate Finance* 14, 446–459.
- Brown, D.T., Ryngaert, M.D., 1991. The mode of acquisition in takeovers: taxes and asymmetric information. *Journal of Finance* 46, 653–669.
- Brown, S.J., Warner, J.B., 1980. Measuring security price performance. *Journal of Financial Economics* 8, 205–258.
- Chemmanur, T.J., Cheng, Y., Zhang, T., 2010. Why do firms undertake accelerated share repurchase programs? Unpublished working paper, Boston College and Florida State University.
- Cheng, Y., Harford, J., Zhang, T., 2009. Bonus-driven repurchases. Unpublished working paper, Florida State University and University of Washington.

- Comment, R., Jarrell, G., 1991. The relative signaling power of Dutch-auction and fixed-price self-tender offers and open-market share repurchases. *Journal of Finance* 46, 1243–1271.
- Cook, D., Kim, J.S., 2006. Derivatives in share repurchase programs. Unpublished working paper, University of Alabama.
- Cook, D., Krigman, L., Leach, C., 2003. An analysis of SEC guidelines for executing open market repurchases. *Journal of Business* 76, 289–315.
- DeAngelo, H., DeAngelo, L., Skinner, D., 2000. Special dividends and the evolution of dividend signaling. *Journal of Financial Economics* 57, 309–354.
- Dickinson, V., Kimmel, P., Warfield, T., 2008. The accounting consequences of accelerated share repurchases. Unpublished working paper, University of Mississippi and University of Wisconsin.
- Diether, K.B., Werner, I.M., 2008. When constraints bind. Unpublished working paper, Ohio State University.
- Fama, E., French, K., 1997. Industry cost of equity. *Journal of Financial Economics* 43, 153–193.
- Flannery, M., Rangan, K., 2006. Partial adjustment toward target capital structures. *Journal of Financial Economics* 79, 469–506.
- Froot, K.A., Scharfstein, D.S., Stein, J.C., 1993. Risk management: coordinating corporate investment and financing policies. *Journal of Finance* 48, 1629–1658.
- Gao, X., Ritter, J., 2010. The marketing of seasoned equity offerings. *Journal of Financial Economics* 97, 33–52.
- Greene, W.H., 1993. *Econometric Analysis*. Prentice-Hall, Englewood Cliffs, NJ.
- Gruillon, G., Michaely, R., 2004. The information content of share repurchase programs. *Journal of Finance* 59, 651–680.
- Guay, W., Harford, J., 2000. The cash flow permanence and information content of dividend increases vs. repurchases. *Journal of Financial Economics* 57, 385–416.
- Hovakimian, A., Opler, T., Titman, S., 2001. Debt-equity choice. *Journal of Financial and Quantitative Analysis* 36, 1–24.
- Hribar, P., Jenkins, N.T., Johnson, W.B., 2006. Stock repurchases as an earnings management device. *Journal of Accounting and Economics* 41, 3–27.
- Huang, R., Stoll, H., 1996. Dealer versus auction markets: a paired comparison of execution costs on NASDAQ and the NYSE. *Journal of Financial Economics* 41, 313–357.
- Ikenberry, D.L., Vermaelen, T., 1996. The option to repurchase stock. *Financial Management* 25, 9–24.

- Jagannathan, M., Stephens, C.P., Weisbach, M.S., 2000. Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics* 57, 355–384.
- Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review* 76, 323–329.
- Kahle, K.M., 2002. When a buyback isn't a buyback: open market repurchases and employee options. *Journal of Financial Economics* 63, 235–261.
- Lee, C., 1993. Market integration and price execution for NYSE-listed securities. *Journal of Finance* 48, 1009–1038.
- Lie, E., 2002. Do firms undertake self-tender offers to optimize capital structure? *Journal of Business* 75, 609–639.
- Marquardt, C.A., Tan, C., Young, S., 2009. Accelerated share repurchases, bonus compensation, and CEO horizons. Unpublished working paper, City University of New York.
- Michel, A., Oded, J., Shaked, I., 2010. Not all buybacks are created equal: the case of accelerated stock repurchases. *Financial Analysts Journal* 66, 55–72.
- Oded, J., 2005. Why do firms announce open market repurchase programs? *Review of Financial Studies* 18, 271–300
- Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An empirical analysis. *Journal of Finance* 53, 27–64.
- Peyer, U., Vermaelen, T., 2005. The many facets of privately negotiated stock repurchases. *Journal of Financial Economics* 75, 361–395.
- Purnanandam, A., Swaminathan, B., 2004. Are IPOs really underpriced? *Review of Financial Studies* 17, 811–848.
- Rhodes-Kropf, M., Robinson, D.T., Viswanathan, S., 2005. Valuation waves and merger activity: the empirical evidence. *Journal of Financial Economics* 77, 561–603.
- Simkovic, M., 2009. The effect of mandatory disclosure on open-market stock repurchases. *Berkeley Business Law Journal* 6, 96–130.
- Stephens, C.P., Weisbach, M., 1998. Actual share reacquisitions in open market repurchase programs. *Journal of Finance* 53, 313–334.
- Vermaelen, T., 1981. Common stock repurchases and market signaling: an empirical study. *Journal of Financial Economics* 9, 139–183.

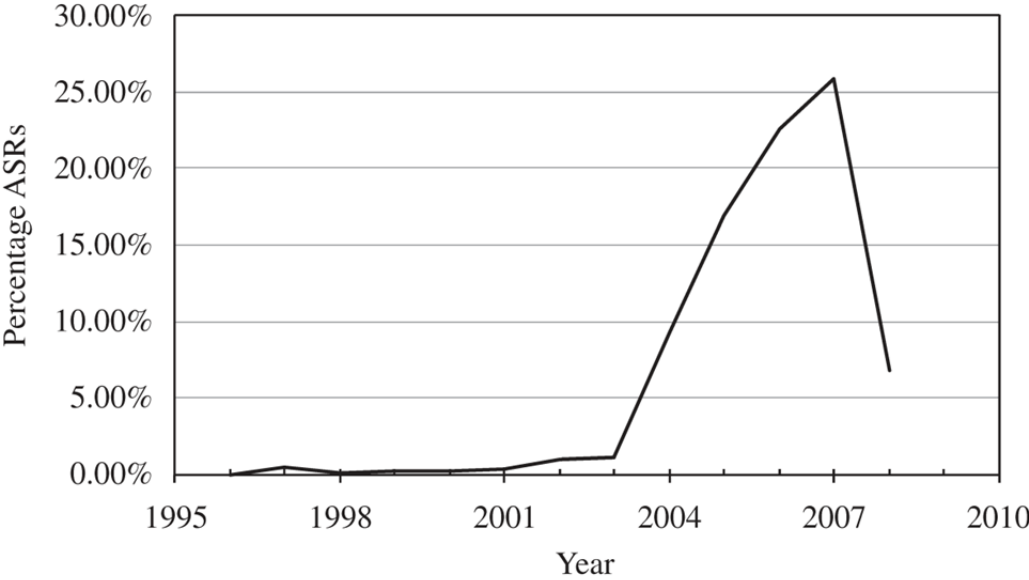
Appendix

Fig. 1: Accelerated Share Repurchase Structure and Timeline



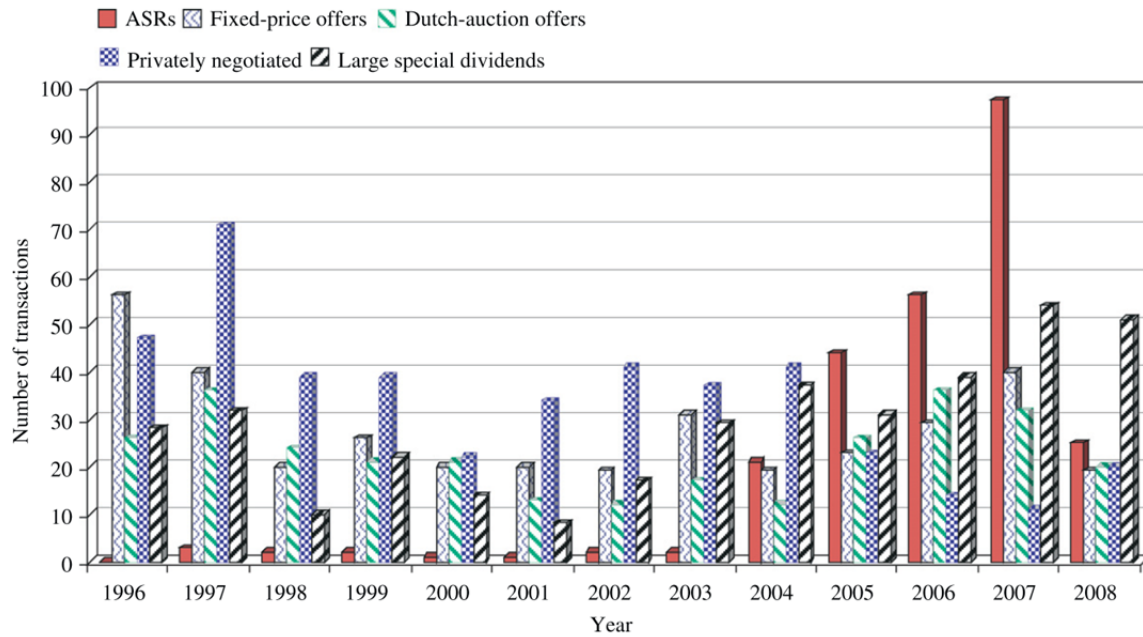
In an accelerated share repurchase, a firm enters into a contract with an intermediary, typically an investment bank, whereby the intermediary immediately delivers a specified number of the firm's shares in exchange for cash based on an agreed upon price per share (ordinarily the most recent closing price). The intermediary obtains the shares that it delivers to the repurchasing firm by borrowing them, typically from institutions. The intermediary then covers its short position by purchasing shares in the market over a specified time period, normally several months. The ASR contract also includes a provision whereby the repurchasing firm is required to compensate or is entitled to receive compensation from the intermediary in shares or cash. The amount of compensation is based on part or all of the difference between the initial price per share paid to the intermediary and the estimated price per share the firm would have paid for the shares in an open market repurchase (OMR) conducted during the same period over which the intermediary buys the shares to cover its short position. The settlement terms are also structured to compensate the repurchasing firm for the opportunity cost of full prepayment for the initial shares when the intermediary actually acquires these shares (closes its short position) over a period of several months. Note that, absent any contractual caps or floors on the settlement amount, the repurchasing firm bears all of the risk of changes in its stock price between ASR initiation and settlement. Thus, the intermediary essentially acts as the firm's proxy in borrowing the firm's shares and the proceeds the intermediary receives at initiation are a source of financing for the intermediary. In sum, ASRs are repurchases with an associated forward contract that can be settled in cash or shares of the firm.

Fig. 2: Ratio of Announced ASRs to Repurchase Program Announcements by Year



For each year of the sample period, we calculate the ratio of ASR announcements to total repurchase program announcements.

Fig. 3: The Frequency of ASRs and Potential Alternatives to ASRs by Year



For each year of the sample period we report the frequency of announcements of: ASRs, privately negotiated repurchases, fixed-price self-tender offers, Dutch-auction self-tender offers, and large special dividends (defined as greater than 5% of outstanding equity). Data on self-tender offers and privately negotiated repurchases are from SDC and data on special dividends are from CRSP.

Table 1: Frequency of ASRs by Year and Transaction Characteristics

<i>Panel A: ASR transactions by year</i>													
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ASRs	0	3	2	2	1	1	2	2	21	44	56	97	25

<i>Panel B: ASR transaction characteristics</i>					
	N	Mean	Median	Minimum	Maximum
Amount (\$mill)	256	530.55	250.00	10.69	12,500.00
Percentage of equity	256	5.27%	3.48%	0.26%	44.13%
Percentage of announced program	256	58.03%	50.70%	5.00%	100.00%
Percentage price difference	93	0.13%	0.00%	-9.49%	11.21%
Days to settlement	178	139.97	131.00	5.00	372.00
Settlement paid by intermediary (\$mill)	103	54.17	22.00	0.00	914.71
Settlement paid by firm (\$mill)	71	33.51	11.90	0.00	523.00
Cash settlement	174	0.42	0.00	0.00	1.00
Agreements with collars, caps, or floors	256	0.24	0.00	0.00	1.00

<i>Panel C: Stated motivation</i>		
	Number of ASRs	Percentage of ASRs
Undervaluation	79	30.86
Capital structure adjustment	24	9.38
Cash from sale of assets/division/equity	21	8.20
Buy-back shares issued in benefit plan	8	3.13
Return cash to shareholders	13	5.08
Buy-back shares related to conversion	8	3.13
Buy-back shares issued in an acquisition	4	1.56
No stated motivation	125	48.83

The sample includes 256 accelerated share repurchase (ASR) transactions announced between 1996 and 2008. Details of the transactions were obtained from SEC filings and searches of newswires archived by Factiva. Panel A reports the frequency of announced ASRs by year. Panel B reports the size of the ASRs in terms of dollars allocated to repurchase shares, the percentage of outstanding equity repurchased in the ASR, and the percentage of the shares in the program repurchased via each ASR. Percentage price difference is the difference between the price paid to the intermediary under the ASR agreement and the closing price on the day prior to the ASR agreement divided by the prior day's price. Also reported are days to settlement, the size of the settlement in dollars paid by the intermediary to the firm or by the firm to the intermediary, and the frequency the settlement is paid in cash. The frequencies with which the ASR agreements include caps and/or floors are also reported. Panel C reports the frequencies that firms stated particular motivations (not mutually exclusive) for undertaking ASRs.

Table 2: Characteristics of Firms by ASR Election

		N	Programs without ASRs	N	Programs with ASRs	Difference
Short-sale constrained	[Mean]	1,228	0.049	205	0.000	0.049***
	[Median]		0.000		0.000	0.000***
Std. dev. returns		1,168	0.021	205	0.015	0.006***
			0.019		0.014	0.005***
Ln(Illiquidity)		1,168	-6.071	205	-8.123	2.070***
			-6.635		-8.275	1.640***
Assets		1,158	16,961	199	29,555	-13,449***
			1,532		7,870	-6,338***
Ln(Assets)		1,158	7.417	199	9.022	-1.605***
			7.334		8.971	-1.637***
Cash/assets		1,158	0.173	199	0.124	0.049***
			0.097		0.058	0.039***
Free cash flow		1,151	0.055	196	0.049	0.006
			0.044		0.038	0.006
Std. dev. free cash flow		1,158	0.039	202	0.023	0.016***
			0.019		0.011	0.008***
High-hedge		1,158	0.187	202	0.119	0.068**
			0.000		0.000	0.000**
Low-hedge		1,158	0.170	202	0.183	-0.013
			0.000		0.000	0.000
Program percentage of equity		1,168	0.073	205	0.103	-0.030***
			0.058		0.079	-0.021***
Prior stock performance		1,168	-0.043	205	-0.001	-0.042***
			-0.027		0.004	-0.031***
Ln(Market-to-book)		1,151	0.444	197	0.389	0.055
			0.420		0.312	0.108
M/B firm		1,151	0.053	197	0.059	-0.006
			0.023		0.034	-0.010
M/B long-run		1,151	0.389	197	0.319	0.070
			0.463		0.329	0.134***
Asset sale		1,168	0.103	205	0.239	-0.136***
			0.000		0.000	0.000***
Takeover		1,168	0.024	205	0.078	-0.054***
			0.000		0.000	0.000***
Leverage		1,148	0.191	197	0.218	-0.027*
			0.122		0.165	-0.043***
Leverage difference		1,148	0.079	197	0.098	-0.019
			0.122		0.120	0.002
EPS bonus		1,166	0.449	205	0.566	-0.117***
			0.000		1.000	-1.000***
Chairman of the board		1,165	0.557	205	0.634	-0.077***
			1.000		1.000	0.000***
Voluntary turnover		1,168	0.077	205	0.141	-0.064**
			0.000		0.000	0.000**

The initial sample includes 256 accelerated share repurchase (ASR) transactions announced between 1996 and 2008. We match each ASR with the repurchase program that is simultaneous with or immediately precedes the ASR announcement. Repurchase program announcement data are obtained from the Securities Data Corporation and searches of Factiva. We limit the analysis below to ASRs announced in 2004 or later. Details on variable construction are provided in Appendix B. Short-sale constrained is a dummy variable that takes a value of one if the imputed interest

rate on borrowing the firms' shares [calculated as in Diether and Werner (2008)] for the calendar month prior to the announcement exceeds the 90th percentile of all firms on the same exchange over 2002-2008 period. We limit the analysis to programs that are not short-sale constrained. Standard deviation of returns is calculated over a period of 255 trading days prior to the repurchase announcement and ending 46 trading days prior to the repurchase announcement, where day 0 is the date on which the repurchase program is announced or the day the ASR is announced if the program included an ASR (and the ASR was not announced simultaneously with the program)

Illiquidity is the Amihud (2002) measure of illiquidity defined as the absolute percentage price change per dollar of daily trading volume, or the daily price impact of the order flow measured over the period of 255 trading days prior to the repurchase announcement and ending 46 days prior to the repurchase announcement. Assets is book value of total assets (Compustat item 6). Cash/assets is the ratio of cash and short-term securities (item 1) to total assets. Free cash flow is gross operating income (item 13) minus the sum of depreciation (item 14), tax payments (item 16), interest expense (item 15), and dividends (sum of items 19 and 21) scaled by total assets. Standard deviation of free cash flow is calculated over the 5-year period preceding the repurchase or ASR announcement. High-hedge takes a value of one if a firm's correlation between cash flow and median industry R&D expenditures is less than -0.2 and zero otherwise. Low-hedge takes a value of one if the firm's correlation between cash flow and median industry R&D expenditures is greater than 0.2 and zero otherwise. Program percentage of equity is the percentage of outstanding equity that the program authorizes for repurchase. Prior stock performance is the cumulative abnormal return over the period starting 44 trading days prior to the announcement and ending 4 days prior to the announcement. Market-to-book is the ratio of market value of assets (common shares outstanding (item 25) times calendar year closing price (item 24) plus total assets minus common equity (item 60) minus deferred taxes (item 74)) to book value of assets. M/B firm, sector, and long-run are as in Rhodes-Kropf, Robinson, and Viswanathan (2005). Asset sale is a dummy variable that takes a value of one if a firm completed an asset sale in the 6 months prior to the announcement of the repurchase program or ASR. Takeover is a dummy variable that takes a value of one if a firm was the target of a takeover attempt in the 6th months preceding the announcement of its repurchase program or ASR. Leverage is long-term debt (item 9) plus debt in current liabilities (item 34) divided by the sum of long-term debt, debt in current liabilities, and market value of equity. Leverage difference is defined as a firm's target leverage minus its actual leverage. Target leverage is estimated as in Flannery and Rangan (2006). EPS bonus is a dummy variable that takes a value of one if earnings per share is explicitly mentioned in the firm's proxy statement as one of the determinants for the bonus plan of the chief executive office (CEO) and zero otherwise. Chairman of the board is a dummy variable that takes a value of one if the CEO of the firm is also the chairman of the board of directors and zero otherwise. The indicator variable Voluntary turnover is equal to one if the CEO is at least 60 years old based on the proxy statement preceding the program announcement and is no longer the CEO at the time of the first proxy statement at least one year after the program announcement. Significance of differences in means (medians) is assessed using a *t*-test (Wilcoxon rank sum test). ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 3: Logit Regressions of ASR Election

Specification	(1)	(2)	(3)
Dependent variable	ASR	ASR	Simultaneous ASR
Std. dev. returns	-104.176*** [0.000]	-104.214*** [0.000]	-98.683*** [0.004]
Ln(Illiquidity)	-0.496*** [0.003]	-0.501*** [0.003]	-0.881*** [0.000]
Ln(Assets)	-0.342 [0.102]	-0.353* [0.092]	-0.870*** [0.005]
Cash/assets	-0.352 [0.708]	-0.360 [0.702]	1.829 [0.140]
Free cash flow	0.173 [0.908]	0.257 [0.863]	0.773 [0.852]
Std. dev. free cash flow	1.764 [0.667]	1.792 [0.662]	-9.963 [0.175]
High-hedge	-0.421 [0.275]	-0.432 [0.266]	-0.462 [0.428]
Low-hedge	0.111 [0.763]	0.107 [0.771]	-0.272 [0.623]
Program percentage equity	6.918*** [0.000]	6.861*** [0.000]	7.859*** [0.007]
Prior stock performance	3.654*** [0.000]	3.625*** [0.000]	4.799*** [0.001]
Ln(Market-to-book)	-1.109*** [0.000]		-2.200*** [0.000]
M/B firm		-1.109*** [0.008]	
M/B sector		-1.376 [0.162]	
M/B long-run		-1.134*** [0.000]	
Asset sale	0.483** [0.045]	0.495** [0.041]	0.516 [0.251]
Takeover	1.179*** [0.001]	1.173*** [0.001]	1.760*** [0.003]
Leverage difference	1.598** [0.019]	1.579** [0.028]	1.484 [0.310]
EPS bonus	-0.022 [0.915]	-0.026 [0.899]	-0.090 [0.797]
Chairman of the board	-0.125 [0.536]	-0.125 [0.536]	-0.407 [0.224]
Voluntary turnover	0.408 [0.168]	0.414 [0.163]	0.534 [0.255]
Constant	-1.667 [0.109]	-1.621 [0.116]	-0.867 [0.638]
Industry & year controls	Yes	Yes	Yes
Observations	1,325	1,325	1,127
Pseudo R-squared	0.256	0.258	0.296

Specifications (1) and (2) report the results of logit regressions where the dependent variable takes a value of one if a firm included an ASR in its repurchase program and zero otherwise. Specification (3) reports the results of a logit regression where the dependent variable takes a value of one if a firm announces an ASR simultaneously with a repurchase program announcement and zero if a program is not associated with an ASR. Independent variables are as defined in Table 2. Industry controls are based on the 12 Fama and French (1997) industry classifications. The coefficients on the independent variables are reported along with their p -values in brackets. Reported p -values are based on robust standard errors clustered by firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 4: Fraction of Repurchase Program Completed via ASR

Specification	(1)	(2)	(3)	(4)
Regression	OLS	Multinomial logit No ASR vs. Low	Multinomial logit No ASR vs. High	Multinomial logit Low vs. High
Std. dev. returns	-4.822 [0.503]	-76.754** [0.014]	-132.743*** [0.000]	-55.990 [0.182]
Ln(Illiquidity)	-0.009 [0.669]	-0.461*** [0.006]	-0.573** [0.018]	-0.112 [0.657]
Ln(Assets)	-0.032 [0.227]	-0.239 [0.298]	-0.509* [0.084]	-0.270 [0.398]
Cash/assets	0.019 [0.929]	-0.344 [0.781]	0.184 [0.872]	0.528 [0.731]
Free cash flow	-0.585 [0.450]	1.251 [0.460]	-3.044 [0.277]	-4.295 [0.150]
Std. dev. free cash flow	-0.210 [0.362]	3.589 [0.286]	-7.748 [0.115]	-11.336** [0.044]
High-hedge	-0.077 [0.409]	0.259 [0.625]	-0.947* [0.060]	-1.205* [0.069]
Low-hedge	-0.013 [0.876]	0.446 [0.371]	-0.022 [0.961]	-0.468 [0.427]
Program percentage equity	-1.003*** [0.002]	9.171*** [0.000]	4.356* [0.050]	-4.815** [0.026]
Prior stock performance	-0.105 [0.682]	4.756*** [0.000]	2.719** [0.036]	-2.038 [0.194]
Ln(Market-to-book)	-0.018 [0.808]	-1.068*** [0.005]	-1.038*** [0.003]	0.030 [0.946]
Asset sale	-0.001 [0.982]	0.198 [0.605]	0.679** [0.014]	0.481 [0.261]
Takeover	-0.032 [0.701]	1.235*** [0.007]	1.147** [0.017]	-0.088 [0.887]
Leverage difference	-0.357 [0.122]	2.274*** [0.006]	1.189 [0.156]	-1.085 [0.272]
EPS bonus	-0.100** [0.025]	0.609* [0.053]	-0.425* [0.073]	-1.034*** [0.003]
Chairman of the board	0.009 [0.855]	-0.197 [0.522]	-0.073 [0.759]	0.124 [0.725]
Voluntary turnover	-0.013 [0.850]	0.690* [0.096]	0.228 [0.513]	-0.463 [0.329]
Constant	1.152*** [0.000]	-4.400*** [0.004]	-0.354 [0.793]	4.046** [0.032]
Industry & year controls	Yes	Yes	Yes	Yes
Observations	193	1,325	1,325	1,325
Adjusted R-squared	0.084			
Pseudo R-squared		0.247	0.247	0.247

Specification (1) reports the results of an ordinary least squares regression where the dependent variable is the cumulative fraction of a program that is completed via ASRs and the regression is estimated over the sample of programs including an ASR. Specifications (2), (3), and (4) report multinomial logit estimates derived from the sample of all repurchase programs. In these specifications, we group programs into three categories based on whether the fraction of the program complete via ASR is above 50% (the high fraction group), less than or equal to 50% (the low fraction group), or zero (the no ASR group). Specification (2) reports coefficients for low fraction ASR vs. no ASR. Specification (3) reports coefficients for high fraction ASR vs. no ASR. Specification (4) reports coefficients for low vs. high fraction ASR. Independent variables are as defined in Table 2. Industry controls are based on the 12 Fama and French (1997) industry classifications. The coefficients on the independent variables are reported along with their p -values in brackets. Reported p -values are based on robust standard errors clustered by firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 5: Predicted and Observed Frequencies of ASRs

<i>Panel A: Yearly predicted and observed frequencies of ASRs</i>		
Year	Predicted percentage ASR	Observed percentage ASR
2004	5.88%	10.29%
2005	14.83%	16.10%
2006	20.25%	18.18%
2007	22.96%	20.64%
Out of sample		
2008	13.38%	6.35%
<i>Panel B: Observed ASRs by estimated probability tercile</i>		
	ASR=0	ASR=1
Lowest 3rd	98	1
Middle 3rd	97	3
Highest 3rd	85	15
<i>p-value</i>		0.000***

Panel A tabulates the yearly predicted and observed frequencies of ASRs as a percentage of repurchase program announcements. The probability of an ASR is estimated from the logit analysis in specification (1) of Table 3 using the 2004 to 2007 subsample. If the predicted probability is above the threshold probability that yields the observed number of ASRs within the subsample (32.90%), then we define the observation as a predicted ASR. If the probability is below the threshold, then an ASR is not predicted. The probability of an ASR for the out-of-coefficient estimates. The same threshold probability is applied to the out-of-sample observations. Panel B divides the out-of-sample observations in 2008 into terciles based on the estimated probability of an ASR. The first column on the panel tabulates the number of programs without an ASR within each tercile and the second column tabulates the number of programs with an ASR. The p -value from a Pearson chi-square test that the proportion of ASR firms is the same in each tercile is listed at the bottom of the panel. *** Denotes significance at the 0.01 percent level.

Table 6: Abnormal Returns at ASR and Repurchase Program Announcement

<i>Three-day abnormal return</i>				
	Mean	Median	N	Positive, Negative
All ASRs (1996–2008)	1.43***	0.95***	256	182, 74***
<i>2004–2008</i>				
I. ASRs	1.42***	0.95***	243	171, 72***
II. Subsequent ASR	1.34***	0.93***	184	129, 55***
III. Simultaneous ASR	1.70**	2.01***	59	42, 17***
IV. All programs	1.39***	1.05***	1,337	867, 470***
V. Programs associated with subsequent ASR	0.80**	0.28	151	86, 65
VI. Programs not associated with any ASR	1.46***	1.21***	1,129	741, 388***
Difference III–VI	0.25	0.80		
Difference V–VI	–0.65	–0.93**		

The table reports three-day (-1 to +1) cumulative abnormal returns for ASR and share repurchase program announcements. The ASR sample includes 256 ASRs announced between 1996 and 2008. Of these, 243 ASRs were announced between 2004 and 2008. ASRs announced between 204 and 2008 are further subdivided into ASRs that are announced subsequent to a repurchase program announcement and ASRs that are announced simultaneously with a repurchase program announcement. Difference III-VI denotes the difference in abnormal returns between programs associated with simultaneous ASRs and programs not associated with ASRs. Difference V-VI denotes the difference in abnormal returns between programs associated with subsequent ASRs and programs not associated with ASRs. Significance of tests that mean (median) abnormal returns are different from zero is assessed using a *t*-test (Wilcoxon signed rank test). Significance of the number of positive versus number of negative is assessed using a sign test. * Denote significance at the 0.10 levels. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7: OLS Regressions of Abnormal Returns and Logit Regression of ASR Election

Specification	(1)	(2)	(3)	(4)	(5)
Regression	OLS	OLS	Logit	OLS	OLS
Dependent variable	CAR3	CAR3	Subsequent ASR	CAR3	Combined CAR3
Percentage of equity	0.254** [0.015]	0.240** [0.015]			
Program CAR3			-6.039*** [0.009]		
Simultaneous ASR				-0.004 [0.644]	
ASR					0.003 [0.587]
Std. dev. returns	-0.562 [0.529]	-0.750 [0.396]	-103.501*** [0.000]	-0.322 [0.377]	-0.252 [0.478]
Ln(Illiquidity)	-0.002 [0.479]	-0.003 [0.288]	-0.434** [0.032]	0.000 [0.946]	0.000 [0.859]
Ln(Assets)	-0.002 [0.503]	-0.004 [0.187]	-0.244 [0.326]	-0.001 [0.759]	-0.001 [0.662]
Cash/assets	0.016 [0.598]	0.018 [0.536]	-1.536 [0.186]	0.004 [0.793]	0.000 [0.974]
Free cash flow	0.157 [0.227]	0.159 [0.231]	-2.313 [0.395]	-0.058 [0.197]	-0.051 [0.251]
Std. dev. free cash flow	-0.046 [0.272]	-0.045 [0.259]	4.580* [0.058]	0.010 [0.777]	-0.008 [0.790]
High-hedge	0.001 [0.931]	0.001 [0.939]	-0.346 [0.479]	-0.009 [0.184]	-0.007 [0.255]
Low-hedge	0.007 [0.616]	0.010 [0.486]	0.285 [0.531]	-0.012* [0.081]	-0.010 [0.145]
Program percentage equity	-0.095 [0.173]	-0.083 [0.176]	5.070** [0.015]	0.099** [0.015]	0.142*** [0.001]
Prior stock performance	-0.068* [0.063]	-0.075** [0.029]	3.016*** [0.005]	-0.033* [0.056]	-0.027 [0.100]
Ln(Market-to-book)	0.010 [0.325]		-0.762** [0.019]	-0.001 [0.832]	0.000 [0.943]
M/B firm		0.026* [0.067]			
M/B sector		-0.025 [0.431]			
M/B long-run		0.005 [0.643]			
Asset sale	-0.003 [0.533]	-0.002 [0.680]	0.498* [0.058]	0.001 [0.893]	-0.001 [0.870]
Takeover	-0.023** [0.033]	-0.028** [0.011]	1.107*** [0.010]	-0.017 [0.144]	-0.005 [0.727]
Leverage difference	-0.028 [0.246]	-0.033 [0.165]	1.665** [0.023]	0.010 [0.365]	0.006 [0.580]
EPS bonus	0.006 [0.274]	0.006 [0.205]	-0.072 [0.753]	-0.006 [0.126]	-0.005 [0.146]
Chairman of the board	0.004 [0.459]	0.004 [0.368]	0.010 [0.967]	0.001 [0.752]	0.002 [0.580]
Voluntary turnover	-0.005 [0.592]	-0.006 [0.493]	0.307 [0.349]	0.001 [0.885]	0.006 [0.316]
Constant	0.031 [0.357]	0.034 [0.297]	-2.464** [0.038]	0.022 [0.201]	0.016 [0.350]
Industry & year controls	Yes	Yes	Yes	Yes	Yes
Observations	229	229	1,194	1,137	1,277
Adjusted R-squared	0.127	0.139		0.025	0.026
Pseudo R-squared			0.247		

We limit the analysis in Table 7 to programs and ASRs announced in 2004 or later. Specifications (1) and (2) report the results of OLS regressions where the dependent variable is the 3-day cumulative abnormal return at ASR announcement. Percentage of equity is the percentage of outstanding equity repurchased in the ASR. Specification (3) reports the results of a logit regression where the dependent variable takes a value of one if a firm announced an ASR

subsequent to announcing a repurchase program and zero for programs not associated with an ASR. Program CAR3 is the three-day cumulative abnormal return at the announcement of the repurchase program. Specification (4) reports results of an OLS regression where the dependent variable is the three-day cumulative abnormal return at the program announcement. Simultaneous ASR is an indicator variable equal to one if an ASR is announced at the same time as the program announcement and zero otherwise. The sample for this test excludes programs that include a subsequent ASR. Specification (5) reports results of an OLS regression where the dependent variable is defined as follows. For programs not associated with an ASR, the dependent variable in the regression, Combined CAR3, is the abnormal return at the program announcement. For programs associated with an ASR, the dependent variable is the sum of the abnormal returns at the program announcement and the abnormal returns for any subsequent ASRs conducted within the program. The indicator variable ASR is equal to one for a program that is associated with a simultaneous or subsequent ASR or zero otherwise. Industry controls are based on the 12 Fama and French (1997) industry classifications. The coefficients on the independent variables are reported along with their p -values in brackets. Reported p -values are based on robust standard errors clustered by firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.