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Managerial Commitment to Open-Market Repurchases and Announcement Returns

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Open-market repurchase (OMR) announcements are non-committal because the percentage and timing of actual share repurchases are uncertain. Based on these observations, this study postulates that market participants can infer managerial commitment based on a firm's record of executing prior programs and will respond to the subsequent announcements accordingly. Using simple average and time-weighted methods to measure a firm's record, this study shows that the larger the percentage of shares repurchased and the shorter the time to complete prior programs, the greater the announcement returns for a firm's subsequent OMR announcements. In addition, market participants consider share and time records simultaneously when inferring managerial commitment to subsequent OMRs. We provide several directions for future studies to conclude this paper.

Keywords: Managerial Commitment, Share Repurchase; Open Market, Announcement Return

JEL Classification: G00, G32, G35, M20

I. Introduction

This study explores whether market participants can infer managerial commitment to open market share repurchase (OMR) announcements based on a firm's actual repurchase records in prior programs. Specifically, we postulate that firms establishing strong records of executing prior OMR programs will enjoy positive market reactions to subsequent announcements. This study makes theoretical and practical contributions to the literature. From the theoretical perspective, this study adopts the cognitive psychology literature to the field of finance by considering individuals' ability to retrieve relevant events from memory (Kahneman and Tversky, 1972; Tversky and Kahneman, 1973). Following this theory, this study develops measures according to the recency of OMR announcements, conducts empirical examinations, and finds market participants may assign more weight to the share repurchase records of recent programs than those of earlier ones. From a practical viewpoint, this study shows that both share and time records of prior OMR programs are valuable to market participants in assessing managerial commitment to the subsequent announcements. Particularly, market participants may consider share and time

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records simultaneously when inferring managerial commitment and respond to the subsequent OMR announcements accordingly.

We are motivated to conduct this study because the OMR has become one of the most common forms of corporate payout over the past several decades (Grullon and Michaely, 2004).[1] As many researchers have pointed out, corporate executives have various reasons to buy back their company's own shares on the open market.[2] Some companies use OMRs to return free cash to shareholders to avoid overinvestments, while others announce programs to signal their financial prospects to market participants. A firm's management also may make OMR announcements to reveal share undervaluation, boost earnings per share, or deter hostile takeovers. Because of these perceived benefits, market participants have viewed OMRs as good news about the announcing firms. As a result, they tend to react positively to OMR announcements (Stephens and Weisbach, 1998; Jagannathan and Stephens, 2003; Grullon and Michaely, 2004).

Differing from fixed-price and Dutch auction tender offers, firms making OMR announcements are not obligated to buy back shares from the open market or to provide timetables as to when they plan to deliver on their promises. Given the non-committal nature of OMRs, firm executives making such announcements have considerable flexibility regarding the amount and timing of actual share repurchases (Guay and Harford, 2000; Jagannathan *et al*., 2000). As documented in the literature, some companies have acquired several times the number of shares announced, while others only bought back a small fraction thereof (Stephens and Weisbach, 1998). Moreover, some firms complete programs immediately after making announcements, whereas others take months, or even years, to reacquire shares from the open market (Cook *et al*., 2004). Despite these uncertainties, the empirical evidence reported in the literature has shown the average abnormal returns around announcements range between 2% and 3% (Stephens and Weisbach, 1998; Jagannathan and Stephens, 2003; Grullon and Michaely, 2004). This magnitude of market reactions to announcements supports the signaling value of OMR programs. Consequently, this perception leads to significant wealth transfer in capital markets. To avoid overly reacting to this corporate news, it is imperative for market participants to assess managerial commitment to OMRs in order to protect their financial interests.

This study argues that market participants can infer managerial commitments to the subsequent announcements based on managerial actions in the past. When a firm makes multiple announcements, its prior share repurchase records provide a trajectory of managerial actions. By tracking the records of executing previously announced programs, market participants can infer what management may do with regard to subsequent programs. If a firm bought back its shares as announced and completed prior programs promptly, it should strengthen market participants' confidence in the firm's commitment to subsequent announcements. On the other hand, if the firm

[1] As suggested by Ikenberry *et al.*, 1995, the adoption of U.S. Securities and Exchange Commission Rule 10b-18—the safe harbor provision—is the main driver of the increasing popularity of OMR programs. Under this provision, firms cannot be accused of manipulating stock prices using share repurchase programs as long as they have complied with the Securities and Exchange Commission regulations. Because of Rule 10b-18, most litigation risks have been removed for firms that decide to make OMR announcements.

[2] The literature suggests that firms buy back their own shares to adjust their capital structures (Dittmar, 2000; Grullon and Ikenberry, 2000; Brav *et al*., 2005). They can also use OMRs to boost earnings per share (Grullon and Ikenberry, 2000; Brav *et al*., 2005), substitute dividend payments (Ikenberry *et al*., 1995; Brav *et al*., 2005), deter hostile takeovers (Bagwell, 1991; Dittmar, 2000), and reveal share undervaluation (Vermaelen, 1981; Comment and Jarrell, 1991; Ikenberry *et al*., 1995; Stephens and Weisbach, 1998; Ikenberry *et al*., 2000; Jagannathan *et al*,, 2000; Cook *et al*., 2004; Oded, 2005). Moreover, firms can use these programs to return excess cash on hand to shareholders (Stephens and Weisbach, 1998; Dittmar, 2000; Jagannathan *et al*., 2000; Grullon and Michaely, 2004; Skinner, 2008; Oded, 2009).

failed to execute prior OMRs, it would weaken market participants' confidence in managerial promises. If prior records of share buybacks matter, we would expect market participants to react to the subsequent announcements according to a firm's records of executing previously announced programs. Moreover, market participants may take share and time records of all prior programs into account simultaneously to form their beliefs regarding the managerial actions on OMRs when firms have made multiple announcements.

To examine these questions empirically, we calculate a firm's records of prior OMR programs using two measures: the percentage of shares repurchased and the time to complete prior programs. To obtain the values for both records, we take the following steps. First, we calculate (1) the number of shares repurchased relative to the number of shares authorized to buy back (referred as "shares repurchased"), and (2) the time taken to complete each announcement (referred as "time to complete"). We then compute a firm's record of shares repurchased and time to complete of all previously announced programs. To calculate this record, we use the simple average and time-weighted average (TWA) methods. Differing from the simple average method which weighs all prior programs equally, the TWA method assigns more weight to the more recent OMR announcements. We implement the TWA method in this study because the cognitive psychology literature has pointed out that it is easier for individuals to recall a recent event than earlier ones when making decisions (Kahneman and Tversky, 1972; Tversky and Kahneman, 1973).

Using 2,644 non–first-time announcements made by the publicly listed firms in the United States and calculating the firms' records of shares repurchased and time to complete prior OMRs using the simple average and TWA methods, our analyses show that market participants are able to infer managerial commitment to OMRs. More importantly, their reactions to subsequent OMR announcements reflect a firm's record of executing all prior programs. Specifically, the larger the percentage of shares repurchased and the shorter the time to complete prior OMR programs, the greater the announcement returns to a firm's subsequent OMR announcements. To ensure the empirical results reported in this study are robust, we conduct several tests. These robustness tests yield results that are consistent with the main findings reported in the study.

The findings of this study have the following implications for corporate management and market participants. For firm management, this study indicates that it is beneficial for firms to have executed prior OMR programs. With good records on prior repurchases, OMR announcements can be one of the effective avenues for management to communicate with market participants. For market participants, reacting to OMR programs leads to wealth transfers. Therefore, they should infer managerial commitment to subsequent OMRs according to actions taken by the corporate executives in the past. In particular, a firm's record of executing prior programs over time can be a valid indicator to assess managerial commitment to subsequent OMR announcements.

This paper proceeds as follows. Section II reviews the literature and develops the research hypotheses. Section III outlines the data sources and measurements of OMR records over time. Section IV discusses the research methodology and outlines the regression models. Section V presents the empirical results. Section VI shows the results of robustness tests. Section VII summarizes the study, discusses the implications of empirical findings of the study to corporate management and market participants, and highlights directions for future studies.

II. Literature Review and Hypotheses Development

A. Literature Review

Firms making OMR announcements not only have flexibility in determining the percentage but also in the timing of share repurchases. As for the percentage of share repurchases, Stephens and Weisbach (1998) find the actual percentage of OMRs varies across U.S. firms. Ikenberry *et al*. (2000) also report that the percentage of shares repurchased in Canada differs among firms and the extent of repurchases could be contingent upon the degree of mispricing of equity shares. In addition, Rau and Vermaelen (2002) show that the percentage of shares repurchased in OMR programs among U.K. firms appears to be much smaller than those of companies in the U.S. Regarding the timing of share repurchases, the literature indicates that managerial assessments of market timing and trading strategy are major determinants of share repurchase decisions. Focusing on market timing, Ikenberry *et al*. (2000) report that executives in Canada buy more shares back from the open market when stock prices fall. Brockman and Chung (2001) and Zhang (2005) demonstrate that the managers of Hong Kong firms focus on the timing of share repurchases and buy more shares back after their stock prices drop. With regard to the trading strategy, Ginglinger and Hamon (2007) show that OMR activities in the French market largely reflect a contrarian trading strategy.

Since many firms make multiple share repurchase announcements, it is imperative to find out whether firm characteristics influence managerial decisions on executing OMRs. To explore this insight, Jagannathan and Stephens (2003) emphasize the relation between managerial incentives and the frequency of OMR announcements. Dividing the studied firms into two subgroups, the authors find that companies making less frequent announcements are more likely to have information asymmetry between corporate executives and market participants.[3] Moreover, companies making more frequent announcements tend to have a higher propensity for buying back shares from open markets and using this program in lieu of dividend payments. Overall, this result indicates that the frequency of announcements could be an important factor to consider when examining issues relate to OMRs.

To infer managerial actions, Weigelt and Camerer (1988) argue that individuals can gather historical data and form beliefs according to management's actions in the past to gauge how managers will act in the future. Applying this logic to OMRs, we argue that market participants probably can gauge managerial commitment to subsequent programs based on the percentage and timing of the execution of all prior OMRs. Since managers can establish a reputation based on their prior actions on OMRs, their records of shares repurchased and time to complete prior programs over time can be valid indicators for market participants to infer managerial commitment to subsequent announcements. If a firm reacquires shares from the open market as promised and completes programs promptly, these actions speak loudly about corporate executives' commitments to subsequent OMRs. On the other hand, if firms fail to deliver what they promise in prior programs, this lack of action will diminish market participants' confidence in managerial commitment to carry out the subsequent programs. Because the nature of OMRs is non-committal and managerial action is highly uncertain, this study provides an empirical link between a firm's

[3] Moreover, Jagannathan and Stephens (2003) show that larger firms with less volatile operating income and higher dividend payout ratios tend to make repurchase announcements more frequently. In contrast, smaller firms with more volatile operating incomes, lower institutional ownership, lower market-to-book ratios, and high degrees of information asymmetry tend to make repurchase announcements less frequently.

records of executing prior programs over time, managerial commitment, and market reactions to subsequent OMR announcements.

B. Effect of Prior Repurchases on Announcement Returns

Since market participants probably can infer managerial commitment to subsequent OMRs based on their actions in the past, corporate executives probably should build records of executing prior OMRs to ensure the effectiveness of communications made in subsequent announcements. If management fails to execute prior OMRs, a lack of managerial action will send a signal to market participants that the announcing firm does not have a strong commitment to their subsequent OMRs. Consequently, it would weaken the quality of the communication between firm management and market participants.

Following up on Weigelt and Camerer (1988), we also argue that market participants probably will consider all historical repurchasing records to form their beliefs on whether, and to what extent, the announcing firms will carry out the subsequent OMRs. To demonstrate their commitments to subsequent OMRs, corporate executives can repurchase a high percentage of shares in their previously announced programs and establish their reputation over time. Therefore, market participants should be able to infer managerial commitment to OMRs according to the prior records of actual shares repurchased and decide how to react to the subsequent announcements. Measuring market participants' reactions to OMR announcements based on the amount of cumulative abnormal returns (CARs), we predict the following:

Hypothesis 1: Firms repurchasing higher percentages of shares in prior OMRs will experience higher CARs on the subsequent announcements.

In addition to the percentages of shares repurchased in prior programs, the time taken to complete prior OMRs also may influence the announcement returns for the subsequent programs. If a firm buys back shares from the open market promptly following announcements, these actions indicate that corporate executives are not only confident about the repurchasing decisions they make but also have sufficient resources to fulfill their promises. Therefore, the timely completion of prior OMRs will enhance a firm's credibility for the promises made in subsequent announcements. Following this logic, we postulate that market participants may use the time to complete prior OMR programs to discern managerial commitment and determine how to react to subsequent announcements. Measuring market participants' reactions to OMR announcements using CARs, we predict the following:

Hypothesis 2: Firms taking shorter times to complete prior OMRs will experience higher CARs on the subsequent announcements.

III. Data

A. Sample Selection Processes and Data Collection

We obtained announcement data from the Security Data Company's (SDC) *Mergers and Acquisitions* database (Jagannathan and Stephens, 2003; Grullon and Michaely, 2004; Lie, 2005). To select samples for the study, we took the following steps. First, we identified 7,673 OMR programs, as completed by publicly listed firms in the U.S., from 1985 to 2012. Since the purpose

of the study is to explore whether the records of executing previously announced OMRs over time would affect market reactions to the subsequent announcements, we excluded 3,116 first-time announcements from the study because these do not have prior programs.[4] We then removed 624 announcements from the pool of observations because the percentage of actual shares repurchased and the details of the repurchase timing were missing from the SDC database. We also eliminated 937 programs from the analyses since the data used to calculate CARs were incomplete in the Center for Research in Security Prices (CRSP) files. Finally, we took 352 more programs out of the sample pool because data for the control variables was not available in the database. This left us with 2,644 non–first-time OMR programs. Table 1 presents the sample selection procedures.

Table 1: Sample Selection Procedures

Sample Selection Procedures		**Number of Observations**
Total number of observations obtained from SDC during the studied period, from 1985 to 2012		7,673
Less: The first-time announcement	3,116	
Percentage of shares repurchased and elapsed time of programs missing from the SDC database	624	
No cumulated abnormal returns or excess return data available	937	
Data on control variables missing	352	5,029
Final samples included in this study		2,644

Note: This table presents the criteria used to select observations for the study. Since the purpose of this study is to determine whether the records of executing prior programs affect market reactions to subsequent OMR announcements, we exclude 3,116 *first-time* OMR announcements from the study.

As for the data source, prior OMR studies collected data from CRSP and/or Compustat (Stephens and Weisbach, 1998; Jagannathan *et al*., 2000; Lie, 2005). Instead, we retrieved the number of shares repurchased, authorization date, completion date, and other program-related data from the SDC *Mergers and Acquisitions* database.[5] We made this choice because companies included in the study may make multiple OMR announcements within a relatively short time (e.g., within a year). Therefore, estimating the records of shares repurchased and the time to complete prior OMRs using the CRSP database and/or Compustat files may lead to inaccurate measurements of variables for each OMR program.

Table 2 presents the sample distribution by year. The period of study is from 1985 to 2012. However, no OMR announcements made between 1985 and 1989 are included in the pool of observations for two reasons. One is that many programs announced during the late 1980s were

[4] To form a record of executing previously announced OMRs, firms must make multiple OMR announcements. In this study, we argue that market participants will probably examine what firms have done in the past before determining what to do in relation to subsequent announcements. Therefore, first-time OMR announcements are not included in the study.

[5] To verify the source of the data, we contacted the SDC. The database representative informed us that they obtained the shares repurchased data from the announcing firms' press releases, regulatory filings, and other sources.

first-time announcements. Therefore, there are no prior share and time records. In addition, we excluded some non–first-time programs announced during this period from the study because the SDC *Mergers and Acquisitions* database does not have the complete data required for the statistical analysis.

Table 2: Distribution of Sample by Year

Year	Frequency	Percentage	Cumulated Percentage
1990	1	0.04	0.04
1993	1	0.04	0.08
1994	37	1.40	1.48
1995	96	3.63	5.11
1996	167	6.32	11.43
1997	120	4.54	15.97
1998	211	7.98	23.95
1999	205	7.75	31.70
2000	232	8.77	40.47
2001	191	7.22	47.69
2002	164	6.20	53.89
2003	155	5.86	59.75
2004	158	5.98	65.73
2005	191	7.22	72.95
2006	196	7.41	80.36
2007	191	7.22	87.58
2008	106	4.01	91.59
2009	48	1.82	93.41
2010	76	2.87	96.28
2011	85	3.22	99.50
2012	13	0.50	100.00
Total	2,644	100.00	

B. Share Record and Time Record

There are two test variables in the analyses: *Share Record* and *Time Record* of OMR programs. We calculate these records using the simple average method and the TWA method. To obtain the value of *Share Record* using the simple average method, we apply the following equation for the *n*th announcement of firm *i*:

$$\text{Share Record (Simple Average)} = \sum_{s=1}^{n-1}\left(\frac{actual\ shares\ repurchased_{i,s}}{shares\ authorized_{i,s}} \cdot \frac{1}{n-1}\right),\ n > 1 \quad (1)$$

To derive the value of *Share Record* using Equation (1), we first calculate the percentage of shares repurchased for each prior program. For a firm that made *n* announcements, there are *n - 1*

prior OMRs. For every prior OMR announcement (denoted as *s*), we divide the number of actual shares repurchased (*actual shares repurchased*) by the number of shares authorized to repurchase (*shares authorized*). This computation yields the percentage of shares repurchased for every prior OMR program. We then take a simple average of the percentage of shares repurchased across *n - 1* announcements to obtain the *Share Record*.

We also follow the simple average method to calculate time to complete the *n*th announcement made by firm *i* by employing the following equation:[6]

$$\text{Time Record (Simple Average)} = \sum_{s=1}^{n-1}\left[ln\left(1 + day\ elapsed_{i,s}\right) \cdot \frac{1}{n-1}\right], n > 1 \quad (2)$$

To obtain the value of *Time Record* using Equation (2), we first count the number of days elapsed from the date of announcement to the date of program completion for every prior OMR program (*days elapsed*). We then take the natural logarithm of (1 + *days elapsed*) to measure the time to complete each OMR announcement. Finally, we calculate a simple average of the time to complete across *n - 1* announcements to obtain *Time Record*.

As discussed earlier, the cognitive psychology literature suggests that decision-makers may assign more weight to more salient or easily remembered information (Kahneman and Tversky, 1972; Tversky and Kahneman, 1973). In particular, Kahneman and Tversky (1972) note that it is easier for individuals to access familiar pieces of information from memory than unfamiliar ones. Therefore, accessibility and familiarity could serve as essential cues of the relevance and accuracy of information for decision-making purposes. To consider this factor, we compute *Share Record* and *Time Record* using the TWA method by assigning more weight to the recent OMRs than those of the earlier ones. As shown below, we employ equations (3) and (4) to calculate *Share Record* and *Time Record* using the TWA method:

$$\text{Share Record (Time Weighted)} = \sum_{s=1}^{n-1}\left(\frac{actual\ shares\ repurchased_{i,s}}{shares\ authorized_{i,s}} \cdot \frac{s}{(n-1)\cdot n/2}\right),\ n > 1 \quad (3)$$

$$\text{Time Record (Time Weighted)} = \sum_{s=1}^{n-1}\left[ln\left(1 + day\ elapsed_{i,s}\right) \cdot \frac{s}{(n-1)\cdot n/2}\right],\ n > 1 \quad (4)$$

The definitions of equations (3) and (4) are the same as those of equations (1) and (2), except for the weights assigned to each prior OMR announcement. The weights of each prior announcement in equations (1) and (2) under the simple average method are the same across *n - 1* programs (i.e., equally weighted). In equations (3) and (4) used for the TWA method, however, we assign weights to the prior announcements using the time digits method. Therefore, the weights in equations (3) and (4) are fractions. To derive the weight for each program, we take the digit assigned to each prior announcement and divide it by the sum of the digits of all the preceding repurchase programs ($(n-1)\cdot n/2$). Therefore, the more recent the OMR announcement, the larger the weight assigned

[6] We take the natural log of the time to complete to reduce the effect of extreme values. This procedure is commonly-used in the literature (e.g., Fama and French, 1992 and 1995; Doidge *et al*., 2004). For programs completed on the day of announcements, the number of days elapsed equals zero. In order to include these programs in the study, we add one day to the number of elapsed days before calculating the natural logarithm of this variable.

to the program.[7] Table A shows how *Share Record* and *Time Record* of prior OMRs are calculated using the simple average method and the TWA method.

Table 3: Illustration of Computing Prior OMR Records

Announcement Date	Completed Date	Percentage of Shares Authorized to be Repurchased	Percentage of Shares Repurchased	In Prior OMR Programs							
				Time to Complete		Track Record of Shares Repurchased		Track Record of Time to Complete		Track Record of Execution Strength	
				In days	In log	Simple average	TWA	Simple average	TWA	Simple average	TWA
Sep. 17, 2001	Apr. 2, 2005	7.21	74.70	1294	3.11						
May 11, 2005	May 9 2006	2.31	87.30	364	2.56	74.70	74.70	3.11	3.11	24.00	24.00
May 09, 2006	Sep. 2, 2006	4.07	105.00	117	2.07	81.00	83.10	2.84	2.74	28.56	30.28
Oct. 24, 2006	Nov. 9, 2006	3.49	106.65	17	1.23	89.00	94.05	2.58	2.41	34.49	39.08

Note: This table demonstrates how this study measures repurchase records. The percentage of shares authorized to repurchase is the number of shares authorized to be repurchased divided by the number of shares outstanding at the repurchase authorization date. The percentage of shares repurchased is the number of shares actually repurchased scaled by the number of shares authorized. The time to complete in days is the difference between the completion and announcement dates. The log of the time to complete is the natural log of the difference between the completion and announcement dates. We calculate the record of shares repurchased in prior OMRs using the simple average and TWA methods. In the simple average method, we compute the record of shares repurchased in prior OMR programs by calculating the simple average of actual shares repurchased as a percentage of shares authorized in prior programs. In the TWA method, we compute the record of shares repurchased in prior OMR programs by taking the TWA of actual shares repurchased as a percentage of shares authorized in prior programs. We compute the record of the time to complete prior OMRs using both the simple average and TWA methods. In the simple average method, we compute the track record of the time to complete prior OMR programs by calculating the simple average of the length of time (as a natural log) to complete prior programs. In the TWA method, we compute the track record of time to complete prior OMR programs by calculating the weighted average length of time (as a natural log) to complete prior programs. Similarly, we compute the record of execution strength in prior OMR programs using the simple average and TWA methods. In the simple average method, we divide the simple average of the record of shares repurchased in prior OMR programs by the simple average of the record of time to complete prior OMR programs. In the TWA method, we divide the record of shares repurchased in prior OMR programs by the record of the time to complete prior OMR programs.

IV. Methodology

We develop regression models to explore whether market participants could infer managerial commitment to subsequent OMRs. We also examine whether firms that established strong records in the prior programs would enjoy higher and positive reactions to the subsequent announcements than those that have not. Using *Share Record* and *Time Record* to gauge managerial commitment, we predict that there is a positive (negative) effect of *Share Record* (*Time Record*) on the market reactions to subsequent OMRs. To measure market reactions to subsequent OMR announcements, we use a three-day CAR (CAR *(-1,1)*), centered on the announcement date, as the dependent

[7] Let us assume that a company has announced three OMR programs in the past. The simple average method assumes that each repurchase record (both shares repurchased and the time to complete) of these three programs is equally important to market participants. On the other hand, the TWA method assumes that the repurchase record of the third announcement (3/6 of the weight) is more important to market participants than that of the second (2/6 of the weight) or the first (1/6 of the weight) announcement.

variable.[8] To mitigate potential confounding effects on announcement returns, we control for both firm- and program-specific variables in the regression models (Vermaelen, 1981; Comment and Jarrell, 1991; Stephens and Weisbach, 1998; Dittmar, 2000). As shown in Equation (5), we present the regression model used for the analyses:

$$\begin{aligned} \text{CAR} = {} & \beta_0 + \beta_1 Target\ Shares + \beta_2 Excess\ Returns + \beta_3 Assets + \beta_4 MTB \\ & + \beta_5 Net\ Leverage + \beta_6 Dividend\ Payout + \beta_7 Excess\ OCF + \beta_8 Excess\ ICF \\ & + \beta_9 Excess\ Cash + \beta_{10} Share\ Record + \beta_{11} Time\ Record\ + \varepsilon \end{aligned} \quad (5)$$

To identify control variables for the regression model, we follow the findings reported in the literature. First, larger percentages of shares authorized to repurchase (*Target Shares*) reveal more information content about underlying OMR announcements. Thus, this factor may affect the announcement returns on subsequent OMR programs. Moreover, a series of negative abnormal returns prior to an OMR announcement (*Excess Returns*) may indicate the potential undervaluation of equity shares, which would also influence the amount of CAR. Furthermore, the literature shows that information asymmetry between firm management and their shareholders increases as firm size decreases. As such, firm size (*Assets*) may affect market reactions to OMRs as well. We also include the market-to-book ratios prior to OMR announcements (*MTB*) in the regression model to control for possible mispricing of shares and the potential impact of investment opportunities.[9] In addition, we follow Opler *et al*. (1999) and Oswald and Young (2008) by incorporating several variables in the regression model. These control variables are net leverage (*Net Leverage*), dividends (*Dividend Payout*), excess operating cash flows (*Excess OCF*), excess investing cash flows (*Excess ICF*), and excess cash on hand (*Excess Cash*). We incorporate these variables in the regression models to control their effects on market reactions to OMR announcements. Specifically, *Net Leverage* is included to control for the firm's motivation to use OMRs to adjust its capital structure. We also consider *Dividend Payout* to control for firm incentives to use stock repurchases as a substitute for dividend payments. Furthermore, firms with surplus cash but limited opportunities to invest could use share repurchases to mitigate the risk of overinvestment. Therefore, these firms are more likely to fulfill the promises made in OMR announcements. Referring to the extant literature, it documents a positive relation between share repurchase activities and surplus cash measures using *Excess OCF*, *Excess ICF*, and *Excess Cash*. By including these variables in the regression model, we control the effects of surplus cash on market reactions to subsequent OMR announcements.

V. Empirical Results

A. Descriptive Statistics

Table 4 presents the descriptive statistics for the dependent, independent, and control variables in the regression models. The dependent variable of the regression model is *CAR (-1,1)*, the announcement returns to OMRs during a three-day window centered on the announcement date. As shown in Table 4, the average *CAR (-1,1)* for non–first-time OMR programs is 1.72% (standard deviation = 5.33%), which is smaller than the announcement returns reported in prior

[8] We calculate abnormal returns by taking actual returns minus the CRSP equally weighted returns.

[9] Dittmar (2000) includes the market-to-book ratio to control for a firm's investment opportunities, because this may indicate potential share undervaluation.

studies with an average *CAR (-1,1)* for all OMR programs between 2% and 3%. For example, Jagannathan and Stephens (2003) show that the abnormal announcement returns of the first-time announcements are approximately 3%. However, *CAR (-1,1)* of the second and the third announcements are approximately 2% and 1%, respectively. These results suggest that the market reaction to non–first-time announcement returns reported in this study is comparable to those documented in the literature.[10]

Table 4: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Median	P25	P75
CAR(-1, 1) (%)	2,644	1.72	5.33	1.29	-0.74	3.88
Target Shares (%)	2,644	8.22	22.88	5.33	3.87	9.52
Excess Returns (%)	2,644	-2.17	13.49	-1.65	-9.25	5.35
Assets	2,644	7.08	1.88	6.91	5.82	8.30
MTB	2,644	1.61	1.06	1.13	1.02	1.77
Net Leverage	2,644	61.64	42.79	73.97	40.37	91.20
Payout	2,644	13.83	67.95	0.00	0.00	14.27
Excess OCF	2,644	0.51	0.50	1	0	1
Excess ICF	2,644	0.10	0.30	0	0	0
Excess Cash	2,644	0.21	0.41	0	0	0
Share Record (Simple Average)	2,644	87.49	33.21	97.43	78.44	100.00
Time Record (Simple Average)	2,644	5.48	1.00	5.61	4.91	6.11
Share Record (TWA)	2,644	87.58	33.71	97.49	78.06	100.00
Time Record (TWA)	2,644	5.50	1.00	5.62	4.97	6.12

Referring to Table 4, the average percentage of shares authorized to be repurchased relative to shares outstanding is 8.22% (standard deviation = 22.88%). The average percentage of shares repurchased is 87.49% (standard deviation = 33.21%) of the shares authorized in the repurchase announcement. Although the average percentage of shares repurchased is similar to those documented in the literature (Stephens and Weisbach, 1998), there is a wide range of variation in the percentage of shares repurchased across announcements and firms. In addition, we find a sizable range in the average length of time to complete OMR programs. To simplify our presentation, in this study, we do not tabulate the ranges of time to complete OMRs.

[10] This study argues that there is an effect of a firm's records on the returns of subsequent OMR announcements. Since there is no prior OMR before the first announcement, we cannot apply this predicted effect to the first-time announcements. To avoid possible confusion, the average market reactions, *CAR (-1,1),* as reported in Table 3, do not include the market reactions to the first-time announcements.

B. Univariate Analysis

To conduct a univariate analysis, we first divide the pool of samples into two groups according to the medians of the shares repurchased in prior programs (high versus low) and of the time to complete prior programs (short versus long). We then compare the means and medians of *CAR (-1,1)* of these groups (high versus low records of the shares repurchased; short versus long records of the time to complete). These analyses provide preliminary evidence as to whether the market participants react to subsequent OMR announcements based on a firm's records in prior programs.

Table 5: Univariate Test of Market Reactions to Repurchasing Records

Classify Open-Market Repurchase Records According to	In Prior OMR Programs	
	Share Record (High vs. Low)	Time Record (Short vs. Long)
Mean of *CAR(-1, 1)*		
High or Short	1.86	1.97
Low or Long	1.58	1.47
Difference (*t*-Test)	0.28 **	0.50 ***
	(1.32)	(2.39)
Median of *CAR(-1, 1)*		
High or Short	1.34	1.62
Low or Long	1.24	0.98
Difference (Wilcoxon Rank Sum Test)	0.10 *	0.64 ***
	(1.32)	(3.55)

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels in the statistical analysis, respectively. We present both *t*- and *z*-values in parentheses.

Table 5 reveals that the average *CAR (-1,1)* of the high *Share Record* group (1.86%) is larger than that of the low *Share Record* group (1.58%). The difference in *CAR*s between these two groups of observations (0.28%) is significant at the 5% level (t-test: *t*-value = 1.32; *p*-value < 0.05). The median of the *CAR (-1,1)* of the high *Share Record* group (1.34%) is also larger than that of the low *Share Record* group (1.24%). The difference in *CAR*s between the two groups of samples (0.10%) is significant at the 10% level (Wilcoxon rank sum test: *z*-value = 1.32; *p*-value < 0.10).

As for the records of the time to complete prior programs over time, the result from the analysis shows that the average *CAR (-1,1)* of the short *Time Record* group (1.97%) is higher than that of the long *Time Record* group (1.47%). The difference in average *CAR*s between the two groups (0.50%) is significant at the 1% level (t-test: *t*-value = 2.39; *p*-value < 0.01). Moreover, the median of the *CAR (-1,1)* of the short *Time Record* group (1.62%) is larger than that of the long *Time Record* group (0.98%). The difference in median *CAR*s between the two groups of observations (0.64%) is significant at the 1% level (Wilcoxon rank sum test: *z*-value = 3.55;

p-value < 0.01). Based on the evidence obtained from univariate analysis, both *Share Record* and *Time Record* affect the announcement returns of the subsequent OMR programs.

C. Regression Analysis

To further examine the hypotheses stated above, we control the firm- and program-specific variables and regress *CAR (-1, 1)* on the records of executing prior OMRs. First, we include the variables of *Share Record* in Model 1 and *Time Record* in Model 2 separately to explore the individual effects of these records on announcement returns. We then include both records in Model 3 to investigate the joint effect of these two records on announcement returns. Table 6 presents the regression results using the simple average method to measure the prior repurchasing records. Table 7 shows the regression results using the TWA method to gauge a firm's records of executing prior OMR programs. For the purpose of the following discussions, we focus on Model 3 of Table 6 and Model 3 of Table 7 as these models consider both *Share Record* and *Time Record* simultaneously in the regression analyses. For these analyses, we calculate standard errors corrected for firm- and year-level clustering and present t-statistics in parentheses for the following models. We also remove observations with absolute standardized residuals larger than 3.0 before running the regression.

Table 6: Abnormal Returns and the Records of Prior OMR Programs Calculated Using the Simple Average Method

Variable	Pred. Sign	Model 1	Model 2	Model 3
Intercept		3.2352 ***	4.3801 ***	3.9727 ***
		(7.05)	(9.77)	(8.96)
Target Shares	+	0.0149 ***	0.0147 ***	0.0151 ***
		(4.92)	(4.86)	(4.94)
Excess Returns	-	-0.0267 ***	-0.0264 ***	-0.0265 ***
		(-2.41)	(-2.36)	(-2.38)
Assets	-	-0.2213 ***	-0.1991 ***	-0.2006 ***
		(-3.62)	(-2.85)	(-2.88)
MTB	-	-0.2262 ***	-0.2146 ***	-0.2147 ***
		(-2.67)	(-2.61)	(-2.59)
Net Leverage	-	-0.0041 *	-0.0046 *	-0.0049 **
		(-1.50)	(-1.64)	(-1.81)
Dividend Payout	?	-0.0006	-0.0006	-0.0005
		(-0.38)	(-0.38)	(-0.34)
Excess OCF	+	0.0849	0.0943	0.1015
		(0.73)	(0.78)	(0.84)
Excess ICF	+	-0.2792	-0.2406	-0.2466

Table 6: Abnormal Returns and the Records of Prior OMR Programs Calculated Using the Simple Average Method: Continues

Variable	Pred. Sign	Model 1	Model 2	Model 3
		(-0.85)	(-0.72)	(-0.75)
Excess Cash	+	0.0637	0.0618	0.0670
		(0.21)	(0.20)	(0.22)
Share Record (Simple Average)	+	0.0047**		0.0045**
		(1.96)		(1.83)
Time Record (Simple Average)	-		-0.1619**	-0.1555**
			(-1.77)	(-1.71)
N		2,595	2,595	2,595
F-Value		7.45	7.54	7.33
R^2		0.0268	0.0268	0.0280

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. We delete observations with absolute studentized residuals greater than 3.0. We present all *t*-statistics in parentheses according to the estimated standard errors clustered by firms and years.

Table 7: Abnormal Returns and the Records of Prior OMR Programs Calculated Using the TWA Method

Variable	Pred. Sign	Model 1	Model 2	Model 3
Intercept		3.3051 ***	4.4442 ***	4.1084 ***
		(7.19)	(9.30)	(8.61)
Target Shares	+	0.0148 ***	0.0147 ***	0.0150 ***
		(4.90)	(4.86)	(4.92)
Excess Returns	-	-0.0265 ***	-0.0263 ***	-0.0263 ***
		(-2.40)	(-2.35)	(-2.36)
Assets	-	-0.2216 ***	-0.1991 ***	-0.2004 ***
		(-3.62)	(-2.87)	(-2.89)
MTB	-	-0.2270 ***	-0.2139 ***	-0.2146 ***
		(-2.67)	(-2.59)	(-2.57)
Net Leverage	-	-0.0040 *	-0.0045 *	-0.0048 **
		(-1.47)	(-1.63)	(-1.77)
Dividend Payout	?	-0.0006	-0.0006	-0.0005
		(-0.38)	(-0.38)	(-0.34)
Excess OCF	+	0.0809	0.0939	0.0989

Table 7: Abnormal Returns and the Records of Prior OMR Programs Calculated Using the TWA Method: Continues

Variable	Pred. Sign	Model 1	Model 2	Model 3
		(0.69)	(0.77)	(0.81)
Excess ICF	+	-0.2785	-0.2376	-0.2422
		(-0.85)	(-0.71)	(-0.73)
Excess Cash	+	0.0616	0.0607	0.0641
		(0.20)	(0.20)	(0.21)
Share Record (TWA)	+	0.0039 **		0.0037 *
		(1.70)		(1.55)
Time Record (TWA)	-		-0.1733 **	-0.1680 **
			(-1.84)	(-1.79)
N		2,594	2,594	2,594
F-Value		7.27	7.56	7.19
R^2		0.0264	0.0270	0.0278

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. We delete observations with absolute studentized residuals greater than 3.0. We present all *t*-statistics in parentheses according to the estimated standard errors clustered by firms and years.

As illustrated in Model 3 of Table 6 and Model 3 of Table 7, *Share Record* has a significant and positive effect on the *CAR (-1,1)* of the subsequent announcements (the simple average method in Table 6: *t*-value = 1.83 and *p*-value < 0.05, and the TWA method in Table 7: *t*-value = 1.55 and *p*-value < 0.05). These results suggest that firms enjoy higher announcement returns to the subsequent programs when they bought back more shares in previously announced OMRs. As anticipated, the *Time Record* has a significant and negative effect on the *CAR (-1,1)* of the subsequent OMR announcements. (The simple average method in Table 7: *t*-value = -1.71 and *p*-value < 0.05, and the TWA method in Table 7: *t*-value = -1.79 and *p*-value < 0.05). These results confirm our expectations that firms experience higher announcement returns for subsequent programs when they took a shorter time to complete prior OMRs. Therefore, the empirical findings reported in this study support Hypothesis 1 and Hypothesis 2. Furthermore, we find the statistics for the control variables also are consistent with those documented in the literature (Dittmar, 2000; Oswald and Young, 2008). In particular, firms that authorized higher percentages of shares to buy back (*Target Shares*), experienced smaller excess returns (*Excess Returns*), and had smaller firm size (*Assets*) tend to enjoy stronger announcement returns to subsequent OMRs.

VI. Robustness Tests

We conduct three robustness tests in this study. First, we combine *Share Record* and *Time Record* to form an execution strength variable and use it as an alternative measure of a firm's records on prior OMR programs. Second, we use changes in *CAR (-1,1)* between announcements as the dependent variable to analyze the effects of *Share Record* and *Time Record* on market

reaction to OMRs. Finally, we remove observations with concurrent OMR announcement date and quarterly earnings reporting date from the pool of observations and rerun regression analyses. Overall, the results obtained from these analyses are consistent with those documented in Section V.

A. Execution Strength of Prior OMR Programs

It is plausible that market participants may consider both records simultaneously to infer managerial commitment to subsequent OMRs. By buying back more shares (i.e., repurchasing a higher percentage of shares in relation to the number of shares authorized to be repurchased) and acquiring shares promptly (i.e., taking a shorter time to complete OMRs), firms send strong signals to market participants that they have made credible repurchase announcements. More importantly, reacquiring more shares at a rapid pace provides an opportunity for firm management to convert the promises made in the OMR announcements into action. In this study, we refer to this combined variable as *Execution Strength*. If market participants view the *Execution Strength* of prior announcements as a valid indicator of managerial commitment to the subsequent OMRs, one would expect that there is a significant and positive effect of a firm's records of execution strength on the announcement returns to the subsequent OMRs.

Similar to equations (1) to (4), we calculate the execution strength in prior OMRs over time using the simple average and TWA methods. To obtain values of *Execution Strength*, we employ equations (5) and (6), as shown below:[11]

$$\text{Execution Strength (Simple Average)}_{i,n} = \sum_{s=1}^{n-1}\left[\frac{\text{percentage repurchased}_{i,s}}{\ln(\text{days elapsed}_{i,s})}\cdot\frac{1}{n-1}\right],\ n>1. \quad (6)$$

$$\text{Execution Strength (Time Weighted)}_{i,n} = \sum_{s=1}^{t-1}\left[\frac{\text{percentage repurchased}_{i,s}}{\ln(1+\text{days elapsed}_{i,s})}\cdot\frac{s}{(n-1)\cdot n/2}\right],\ n>1. \quad (7)$$

Employing the records of execution strength over time, obtained from the above equations, we then rerun the regressions and report the results of our analyses in Table 8. In Model 1, we calculate the records of execution strength using the simple average method. In Model 2, we compute the records of execution strength using the TWA method. As shown in Table 8, the records of execution strength have significant and positive effects on the *CAR (-1,1)* of the subsequent OMR announcements (the simple average method: *t*-value = 2.07 and *p*-value < 0.05, and the TWA method: *t*-value = 2.13 and *p*-value < 0.05).

[11] The definitions of the variables in equations (6) and (7) are the same as those for equations (1) and (2).

Table 8: Abnormal Returns and the Strength of Executing Prior OMR Programs

Variable	Pred. Sign	Model 1	Model 2
Intercept		3.2606 ***	3.2847 ***
		(6.04)	(6.21)
Target Shares	+	0.0148 ***	0.0148 ***
		(4.95)	(4.95)
Excess Returns	-	-0.0265 ***	-0.0264 ***
		(-2.40)	(-2.39)
Assets	-	-0.2100 ***	-0.2115 ***
		(-3.38)	(-3.41)
MTB	-	-0.2217 ***	-0.2229 ***
		(-2.65)	(-2.64)
Net Leverage	-	-0.0045 **	-0.0044 **
		(-1.70)	(-1.66)
Dividend Payout	?	-0.0006	-0.0006
		(-0.37)	(-0.36)
Excess OCF	+	0.0947	0.0907
		(0.79)	(0.75)
Excess ICF	+	-0.2632	-0.2623
		(-0.79)	(-0.79)
Excess Cash	+	0.0687	0.0663
		(0.22)	(0.22)
Execution Strength (Simple Average)	+	0.0182 **	
		(2.07)	
Execution Strength (TWA)	+		0.0176 **
			(2.13)
N		2,595	2,594
F-Value		7.65	7.59
R^2		0.0269	0.0268

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. We delete observations with absolute studentized residuals greater than 3.0. We present all *t*-statistics in parentheses according to the estimated standard errors clustered by firms and years.

B. Changes in CARs between Announcements

It is possible that the magnitude of announcement returns could depend on firm-specific properties omitted from the regression models presented in the study. To mitigate possible confounding effects of these properties on announcement returns, we use changes in *CAR (-1,1)* between announcements, instead of the *CAR (-1,1)* of individual announcements, as the dependent variable. To rerun the regression analysis, we calculate the changes in *CAR*s between OMR programs using the following equation:

$$\Delta CAR_{i,n} = CAR_{i,n} - CAR_{i,n-1} \quad (8)$$

In Equation (8), $CAR_{i,n}$ is the announcement return for firm *i* at the *n*th announcement during a three-day window. All control variables included in the regression model are those discussed earlier in the study.[12, 13] In Model 1 of Table 9, we present the results of the share and time records calculated using the simple average method. Model 2 of Table 9 shows the results of the share and time records calculated using the TWA method. We also rerun the regressions using the *Execution Strength* as the independent variable. In Table 10, we present the results of these analyses.

Overall, the results shown in Table 9 are similar to those presented in tables 6 and 7. However, the R^2 of the regression models in Table 9 are smaller than those reported in tables 6 and 7. Referring to Model 1 of Table 9, *Share Record* has a significant and positive effect on the changes in *CAR (-1,1)* (Model 1 of Table 9: *t*-value = 2.19 and *p*-value < 0.05, calculated using the simple average method, and Model 2 of Table 9: *t*-value = 2.03 and *p*-value < 0.05, calculated using the TWA method). Moreover, *Time Record* has a significant and negative effect on the changes in *CAR (-1,1)* (Model 1 of Table 9: *t*-value = -1.37 and *p*-value < 0.10, calculated using the simple average method, and Model 2 of Table 9: *t*-value = -1.75 and *p*-value < 0.05, calculated using the TWA method).

[12] In the regression analysis presented in this section, we measure changes in *Target Shares*, *Excess Returns*, *Assets*, *MTB*, *Net Leverage*, and *Dividend Payout* between announcements and use them as control variables.

[13] In this study, we code *Excess OCF*, *Excess ICF* and *Excess Cash* as dummy variables. To examine the effects on changes in *CAR* between announcements, however, we measure the changes in *OCF* and *Cash* instead of coding them as dummies. We do not include changes in *ICF* as a control variable in this additional analysis, because these figures (sales of fixed assets, intangible assets, associates and other investments and subsidiaries) change dramatically from one period to another.

Table 9: Relative Changes in Abnormal Returns Between Announcements and Records of Share Repurchases and Time to Complete Prior OMR Programs

Variable	Pred. Sign	Model 1	Model 2
Intercept		0.3599	0.5955
		(0.35)	(0.59)
ΔTarget Shares	?	-0.0077 **	-0.0078 **
		(-2.36)	(-2.42)
ΔExcess Returns	?	-0.0159 *	-0.0159 *
		(-1.77)	(-1.76)
ΔAssets	?	-0.7891	-0.7566
		(-1.62)	(-1.58)
ΔMTB	?	-0.3491	-0.3506
		(-1.34)	(-1.35)
ΔNet Leverage	?	0.0129 **	0.0127 **
		(2.14)	(2.10)
ΔDividend Payout	?	-0.0003	-0.0003
		(-0.54)	(-0.53)
ΔCash	?	-2.7866	-2.7439
		(-1.35)	(-1.34)
ΔOCF	?	1.0876	1.0784
		(0.74)	(0.74)
Share Record (Simple Average)	+	0.0090 **	
		(2.19)	
Time Record (Simple Average)	-	-0.1919 *	
		(-1.37)	
Share Record (TWA)	+		0.0090 **
			(2.03)
Time Record (TWA)	-		-0.2355 **
			(-1.75)
N		2,403	2,403
F-Value		2.71	2.94
R^2		0.0142	0.0147

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. We delete observations with absolute studentized residuals greater than 3.0. We present all *t*-statistics in parentheses according to the estimated standard errors clustered by firms and years.

In Table 10 we present the regression results obtained using the *Execution Strength* as the independent variable. Referring to Model 1 of Table 10 the *Execution Strength* has a significant and positive effect on the changes in *CAR (-1,1)*, calculated using the simple average method (*t*-value = 3.14 and *p*-value < 0.01). As shown in Model 2 of Table 10 the *Execution Strength* also

has a significant and positive effect on the changes in *CAR (-1,1)*, calculated using the TWA method (Model 2 of Table 9: *t*-value = 3.44 and *p*-value < 0.01). These results demonstrate that the records of *Execution Strength* in previously announced programs over time have significant and positive effects on the changes in returns between the subsequent OMRs.

Table 10: Relative Changes in Abnormal Returns Between Announcements and Records of Execution Strength of Prior OMR Programs

Variable	Pred. Sign	Model 1	Model 2
Intercept		-0.5123 *	-0.5624 **
		(-1.91)	(-2.17)
ΔTarget Shares	?	-0.0077 **	-0.0077 **
		(-2.26)	(-2.29)
ΔExcess Returns	?	-0.0156 *	-0.0155 *
		(-1.74)	(-1.73)
ΔAssets	?	-0.8304 *	-0.8169 *
		(-1.71)	(-1.69)
ΔMTB	?	-0.3455	-0.3464
		(-1.31)	(-1.32)
ΔNet Leverage	?	0.0130 **	0.0129 **
		(2.15)	(2.12)
ΔDividend Payout	?	-0.0003	-0.0003
		(-0.51)	(-0.51)
ΔCash	?	-2.7950	-2.7857
		(-1.37)	(-1.37)
ΔOCF	?	1.1046	1.1081
		(0.75)	(0.76)
Execution Strength (Simple Average)		0.0345 ***	
		(3.14)	
Execution Strength (TWA)			0.0375 ***
			(3.44)
N		2,404	2,404
F-Value		2.66	2.78
R^2		0.0137	0.0141

Notes: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. We delete observations with absolute studentized residuals greater than 3.0. We present all *t*-statistics in parentheses according to the estimated standard errors clustered by firms and years.

C. OMR Programs Announcements Concurrently with Earnings Announcements

To mitigate the possible effect of events announced concurrently with OMR programs on the results reported in this study, we identify whether there are other major events announced concurrently with OMR programs. By carrying out this procedure, we find that numerous firms announced their OMRs concurrently with quarterly earnings announcements. To mitigate the effect of quarterly earnings announcements on the returns of OMR programs, we remove 407 OMR programs because these announcements were made at the same date when quarterly earnings were released. After these removals, we then rerun the regression analyses according to the models specified in tables 6, 7, and 8.

To simplify our presentations, we report the results of the *Share Record* and *Time Record* calculated using the simple average method. Referring to Table 11, we find the results obtained from these analyses are similar to those reported in Section V. According to these findings, we conclude that the results presented in this study are robust and are not sensitive to the concurrency of OMR announcements and quarterly earnings releases.

Table 11: Abnormal Returns and the Track Records of Prior OMR Programs Calculated Using the Simple Average Method (Excluding Concurrent Quarterly Earnings Announcements)

Variable	Pred. Sign	Model 1	Model 2	Model 3
Intercept		3.1630 ***	4.3270 ***	3.9992 ***
		(6.71)	(7.73)	(6.69)
Target Shares	+	0.0128 ***	0.0127 ***	0.0130 ***
		(6.43)	(6.25)	(6.31)
Excess Returns	-	-0.0236 ***	-0.0239 ***	-0.0237 ***
		(-2.78)	(-2.81)	(-2.79)
Assets	-	-0.1983 ***	-0.1757 ***	-0.1761 ***
		(-3.97)	(-3.37)	(-3.37)
MTB	-	-0.2513 **	-0.2415 **	-0.2416 **
		(-2.06)	(-1.99)	(-1.99)
Net Leverage	-	-0.0029	-0.0035 *	-0.0038 *
		(-1.10)	(-1.35)	(-1.46)
Dividend Payout	?	0.0005	0.0005	0.0005
		(0.59)	(0.59)	(0.67)
Excess OCF	+	0.0173	0.0336	0.0393
		(0.11)	(0.20)	(0.24)
Excess ICF	+	-0.3326	-0.2815	-0.2920
		(-0.92)	(-0.78)	(-0.81)
Excess Cash	+	0.0912	0.0868	0.0880
		(0.29)	(0.27)	(0.28)

Table 11: Abnormal Returns and the Track Records of Prior OMR Programs Calculated Using the Simple Average Method (Excluding Concurrent Quarterly Earnings Announcements): Continues

Variable	Pred. Sign	Model 1	Model 2	Model 3
Shares Record (Simple Average)	+	0.0038 *		0.0036 *
		(1.41)		(1.29)
Time Record (Simple Average)	-		-0.1777 **	-0.1722 **
			(-1.94)	(-1.88)
N		2,187	2,187	2,187
F-Value		8.89	9.33	8.56
R^2		0.0252	0.0259	0.0268

Note: The superscripts *, **, and *** indicate the 10%, 5%, and 1% one-tailed test significance levels for a variable with a predicted sign and two-tailed test significance levels for a variable without a predicted sign in the statistical analysis, respectively. Observations with absolute studentized residuals greater than 3 are deleted. All *t*-statistics are presented in parentheses and based on estimated standard errors clustered by firms and years.

VII. Summary and Conclusions

Over the past few decades, OMRs have become one of the important avenues for firms to return excess cash to shareholders, substitute for dividend payments, signal the undervaluation of equity shares, boost earnings per share, or fend off hostile takeovers. Although a rich body of literature has argued that share repurchases often provide positive signals about the announcing firms, the inherent nature of OMRs is highly uncertain since corporate executives are not obligated to deliver what they promise when making announcements. To mitigate the negative effects from overreacting to subsequent OMR announcements, this study contributes to the literature by exploring whether market participants can infer managerial commitment to OMRs. In particular, this study examines whether firms that established strong records of share repurchases and time to complete prior programs enjoy positive market reactions to their subsequent announcements.

In this study, we argue that corporate executives can establish records based on their execution of prior OMR programs over time. By demonstrating their commitment to subsequent programs, it would enhance a firm's announcement returns. Examining companies that have made multiple OMRs, this study shows that the records of the shares repurchased and of the time to complete prior programs are important indicators for market participants to infer a firm's commitment to subsequent announcements. More importantly, these indicators affect market reactions to subsequent OMRs. Given the non-committal nature of OMR announcements, these findings imply that records of OMR execution can be plausible indicators as to how firm management will behave with regard to the subsequent programs. In addition, market participants can use share repurchase records to mitigate the uncertainty associated with OMRs, and thus avoid over-reacting to a firm's subsequent announcements.

Our findings have the following implications for corporate management and market participants. For corporate management, the results show that market participants react less favorably to subsequent OMRs when the announcing firms have failed to deliver what they promised in prior announcements. Thus, corporate executives who choose not follow through on OMR announcements may put themselves at risk of not being able to use open market share

repurchase announcements as an effective tool to communicate with market participants in the future. To avoid this drawback, it is imperative for announcing firms to establish credible records on OMR programs over time. For market participants, the results of this study indicate that they should examine a firm's records of executing previously announced programs, use these to infer managerial commitment to the subsequent OMRs, and determine their own course of action, so they can avoid over-reacting to subsequent programs.

Several issues deserve researchers' attention in future studies. First, it is desirable to extend the findings reported in this study and to continue exploring possible additional factors and investigating their influences on the market reactions to OMR announcements. To conduct these examinations, it is imperative for researchers to develop a theoretical framework and use it to select factors and make predictions as to why certain firms choose to make OMR announcements while others decide not to. Second, as documented in the literature, it is difficult to completely rule out the endogeneity issue of OMR decisions. To mitigate this concern, researchers also should develop a research framework and conduct analyses so they can fully address endogeneity in OMR decisions. Finally, market participants may investigate firm performance following the announcement before reacting to the current announcements. In other words, if market participants observe that firms perform better following OMR programs, they are more likely to react to the subsequent announcements. Although this study has addressed this issue by incorporating control variables in regression models, it would be beneficial for researchers to build theoretical arguments and conduct investigations, so we can gain additional insights on the possible links between firm performance and market participants' reactions to subsequent OMR announcements.

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