DETERMINANTS OF FIRMS MANAGING EPS THROUGH SHARE REPURCHASES

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ABSTRACT

This paper examines the determinants of firms that are able to manage earnings per share (EPS) through share repurchases as compared to firms that are not able to manage EPS through share repurchases. To run the test, I utilize Univariate analysis based on the relation between cost of debt capital (CODC) and cost of equity (E/P ratio). Prior research reports that firms with higher (lower) cost of equity are (not) able to manage EPS through share repurchase (Khaledi and Balsam, 2003). I identify determinants of repurchasing firms based on firms' ability to manage EPS upward. Prior research identifies motivations of share repurchasing firms (Dittmar, 2000). However, Khaledi and Balsam (2003) partition their sample based on the relationship between the cost of debt capital (CODC) and the earnings-price ratio (E/P) to examine whether firms are able to manage EPS through share repurchases. I report that managing firms have higher leverage, are larger, and have a higher E/P ratio. Non-managing firms repurchase more shares, have a higher value of share repurchases, have higher market-to-book values, and pay higher interest rates.

INTRODUCTION

The motives behind share repurchase programs have changed over the years. Dittmar (2000) presents some motivations behind share repurchase announcements. Dittmar states that when firms' capital exceeds their investment opportunities, the firms either distribute excess cash to the investors or retain the cash. Cash distribution to investors may be categorized into two forms: as dividends or as share repurchases. Share repurchases have advantages over dividend payouts as a method of cash distribution. In fact, firms that carry out share repurchase programs are not committed to announce future share repurchases.

The market does not expect cash distribution in the form of share repurchases in a regular basis as appose to dividends. Stock of repurchasing firms will not be affected negatively by not announcing future share repurchases. Signaling stock undervaluation is cited by prior research as another motive of share repurchases (Dittmar 2000). Firms repurchase their shares because they believe that their shares are undervalued. The premise is based on the information asymmetry between insiders and investors. By repurchasing their shares, firms signal the market that they have inside information that their shares are worth more than their present value.

Optimizing the leverage ratio is the third motive behind share repurchases. Firms repurchase their shares so they can reach the desired leverage ratio by reducing the number of shares outstanding in the denominator calculation (Dittmar 2000). To dilute the effect of stock options, firms repurchase their shares so options exercised have no effect on shares' value.

In the merger market, an outside party tries to takeover the target firm. As a defense, the target firm repurchases its shares to raise the lowest share price to make it more expensive for the outside party to takeover the firm. Dittmar argues that the motive for share repurchases changes over time due to the increase in certain activities. Dittmar argues that stock options dilution as a motive behind share repurchases increased in the early 1990's due to the large amount of options granted to the employees and management.

However, recent research has focused on share repurchases as a self-serving behavior tool (Khaledi and Balsam, 2003; Bens et al, 2003). Khaledi and Balsam (2003) and Bens et al. (2003) report that firms are able to manage EPS through share repurchases when the cost of debt capital is less than the cost of equity. Prior research reports positive abnormal returns on and post share repurchase announcements (Comment and Jarrel, 1991). This implies that managers not only manage EPS through reducing the number of shares outstanding, but also are able to increase the price of the stock. This paper extends our understanding on the determinants of firms that use share repurchases as a tool to manage EPS.

The study's contribution is that it uses current interest rates to proxy for the cost of debt capital not prior interest expenses as in Khaledi and Balsam (2003) because historical data (interest expenses) are not relevant in share repurchase decisions.

RESEARCH DESIGN

To differentiate between firms that are able to manage EPS through share repurchases (managing firms) and firms that are not able to manage EPS through share repurchases (non-managing firms), I partition the sample based on the relation between the cost of debt capital (CODC) and the earnings-price (E/P) ratio, the proxy for cost of equity. When CODC for a firm is lower than its cost of equity, the firm is better off to repurchase its shares by borrowing cash or using available cash on hand. To run the test, I use Univariate analysis to see how the firms behave according to their cost of debt capital in relation to their E/P ratio.

VARIABLES

Prior research has generally ignored share repurchases as a way of managing EPS (Khaledi and Balsam, 2003). Share repurchases reduce the number of shares outstanding, the denominator in EPS calculation. As the number of shares outstanding in the EPS calculation decreases, EPS increases holding net income constant. However, net income will be affected by the interest expense incurred in the case where share repurchases are financed by issuing debt or by the interest income forgone if the share repurchases are financed by selling firm's securities or using available cash. The relative change in the numerator (interest effect) and denominator (share reduction effect) will determine whether share repurchases increase or decrease EPS.

The variables that are included in this study are presented in the literature (e.g. Khaledi and Balsam, 2003). I examine certain variables and see whether any change exists between each variable's mean within the two sub-samples based on the relationship between CODC and E/P ratio. I use the value of shares outstanding (VALUEREP)[1] and change in share repurchases (REPURCH) as used in a previous study as proxies for share repurchases (Khaledi and Balsam, 2003). I define change in shares repurchases (REPURCH)[2] as the percentage change in shares outstanding during the year.

I expect the change in shares outstanding to be negative (positive) if share repurchases are more (less) than share issuance. I follow Khaledi and Balsam's (2003) definition of the value of shares outstanding which is the dollar amount of shares repurchases net of the dollar amount of share issuance during the year (VALUEREP).

COST OF DEBT CAPITAL (CODC):

The cost of debt capital (CODC) is one of the determinants of share repurchases. Firms with high cost of debt capital are less likely to repurchase their shares if they intend to manage EPS upward. If the cost of debt capital exceeds the earnings-price ratio (see Khaledi and Balsam, 2003), then share repurchases will actually reduce EPS. Khaledi and Balsam (2003) report a negative relation between CODC and share repurchases. I measure *CODC* as interest rate required for the corresponding bond rating[3] for each firm.

EARNINGS-TO-PRICE (E/P):

I use earnings-price (E/P) ratio as in Khaledi and Balsam (2003) who use E/P to proxy for cost of equity. Firms with E/P lower than CODC will not be able to increase their EPS by share repurchases because the decrease in the numerator of the EPS is more than the decrease in the denominator of the EPS. This results in a decline in EPS. I use E/P to compare it with CODC in order to partition the sample into firms that are and firms that are not able to manage EPS upward. Khaledi and Balsam (2003) report insignificant results for the E/P ratio.

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[1] I use VALUEREPURCH as well. It is the difference between the values of share repurchases between the current year and last year.

[2] I use LEVELREPURCH in the analysis. It is defined as the current number of shares outstanding minus last year's shares outstanding.

[3] I use the marginal cost of debt estimated based on the corporations' bond rating and the current yield for bonds of that rating.

ABILITY TO MANAGE (ABLE): CODC VERSUS E/P:

Not every firm can manage its EPS upward through share repurchases. To identify firms that can manage their EPS through share repurchases, I compare their cost of debt capital (*CODC*) with their earnings-price ratio (*E/P*). I argue that a firm can manage its EPS upward through share repurchases if *CODC* < *E/P*. I use a dummy variable (ABLE) that takes a value of 1 if CODC < E/P and 0 otherwise.

MARKET-TO-BOOK RATIO OF ASSETS (MVBV):

I follow Fenn and Liang (2001) and use Market-to-Book Ratio of assets (MVBV) as a measure of investment opportunities. Market-to-book (assets) ratio is defined as total assets minus the book value of equity plus shares outstanding, adjusted for stock splits, multiplied by stock price, all deflated by lag of total assets. Fenn and Liang argue that firms with high investment opportunities will use cash resources to invest in positive net present value projects rather than to repurchase shares. They report a significant negative relationship between MVBV and share repurchases.

GROWTH IN SALES (Δ LOGSALES):

Firms with growth opportunities need cash to capture investment opportunities in order to expand their market share. Bens et al. (2003) use change in log of sales (Δ LOGSALES) as a proxy for growth. Change in log of sales is calculated as current log of sales minus last period's log of sales deflated by last period's log of sales. Bens et al. (2003) argue that firms with high growth will less likely to repurchase their shares. They report an inverse relationship between Δ LOGSALES and share repurchases.

CAPITAL EXPENDITURE (CAPEXP):

Firms expand their operations by investing in positive net present value projects. These expansions require that these firms use their cash for capital expenditures rather than for share repurchases. Kahle (2002) uses capital expenditure deflated by lag of total assets (CAPEXP) to control for cash payouts. Kahle argues that firms will repurchase less of their shares outstanding when they plan to spend on capital expenditure. Kahle (2002) reports a negative relationship between capital expenditure and share repurchases. Grullon and Michaely (2004) use the same argument that firms with more capital expenditures are less likely to repurchase their shares. They document that firms repurchasing their shares are more likely to reduce their current level of capital expenditures.

EARNINGS MANAGEMENT: DISCRETIONARY ACCRUALS (DAC):

Prior literature documents (Jones, 1991; DeFond and Jiambalvo, 1994) managers' self-serving behavior in the form of earnings management. Managers manage earnings by increasing or decreasing earnings to the desired level. Several studies examine market motivated earnings management (Teoh et al., 1998a; Teoh et al., 1998b) and show managers overstate earnings prior to financial events. Teoh et al. (1998a) examine whether managers inflate earnings by increasing earnings through discretionary accruals. Teoh et al. (1998a) report that managers manage earnings, which is evidenced by investors overlooking pre-issue earnings for seasoned equities without fully adjusting for possible discretionary accruals manipulation. I include discretionary accruals (DAC_t) as a determinant of share repurchases. DAC is defined as discretionary accruals using Jones (1991) cross sectional model as in Defond and Jiambalvo (1994).

DEBT-TO-ASSETS RATIO (LEVERAGE):

I include debt-to-total assets (LEVERAGE) to control for firm's payout decision. Kahle (2002) uses LEVERAGE and posits that debt is a substitute for payouts to shareholders. Fenn and Liang (2001) use leverage arguing that debt is an alternative method of disgorging free cash flow and thus firms with high debt will be less likely to pay out dividends or repurchase shares. Kahle (2002) and Fenn and Liang (2001) report a negative relation between debt and share repurchases.

CASH FLOW FROM OPERATIONS (CFO):

Firms with excess cash flows beyond their investment needs may distribute the excess cash either through dividend or share repurchases. To see the effect of share repurchase as a method of cash payout, I use CFO in my test expecting to find a difference between CFO for firms that are able to manage EPS and that of non-managing firms. Fenn and Liang (2001) use cash flow from operations deflated by lag of total

assets (CFO) to control for excess cash effects on share repurchases decisions. They report that CFO increases repurchases.

LOG OF TOTAL ASSETS (SIZE):

Firms' size (SIZE) is used to proxy for political costs (Watts and Zimmerman, 1986; Zimmerman, 1983), information asymmetry (Atiase, 1985; Dittmar, 2000), litigation risk (Lys and Watts, 1994) and any other omitted variables. Prior studies use log of assets to proxy for firms' size (Bens et al., 2003; and Dittmar, 2000). I include log of total assets to control for the effect of firm's size.

SAMPLE SELECTION

Table 1 presents the sample selection procedure. I use firm level data from Compustat for years 2000-2002 to obtain financial and stock price data. The initial Compustat sample is 27,720 firm-years. I delete 18,932 missing Compustat observations leaving 8,788 available observations. I delete another 7,575 missing Bond Rating observations, which results in 1,213 available observations that are used in the analysis.

DESCRIPTIVE STATISTICS

Table 2 presents descriptive statistics for the variables used in the study. The mean (median) for the change in shares outstanding compared to previous year (LEVELREPURCH) is $4.96 ($0.44) million for firms that are able to manage EPS through share repurchases (when ABLE = 1) vs. $15.71 ($0.39) million for firms not able to manage EPS (when ABLE = 0). Although the mean differs for managing firms and non-managing firms, I find that the median is roughly similar between the two sub-samples.

The mean (median) for percentage change in shares outstanding (REPURCH) is 2.40% (0.34%) for managing firms (when ABLE = 1) vs. 2.40% (0.28%) for non-managing firms (ABLE = 0). I find that the means' difference is greater than the medians' difference. This shows that percentage change in shares outstanding is greater for managing firms. The mean (median) for the change in value of share repurchases compared to previous year (VALUEREPURCH) is $-3.06 (0.00) for managing firms (when ABLE = 1) vs. $130.32 (0.00) for non-managing firms (when ABLE = 0). This result indicates that on average managing firms spend more on share repurchase programs than non-managing firms as indicated by the negative sign for managing firms. However, there is no significant difference in the median of the dollars spent between managing and non-managing firms on share repurchase programs.

The mean (median) for percentage change in the value of share repurchases (VALUEREP) is -0.14% (0.00%) for managing firms (when ABLE = 1) vs. 0.00% (0.00%) for non-managing firms (when ABLE = 0). The mean (median) for market-to-book value (MVBV) for firms that are able to manage EPS through share repurchases is 134% (117%) vs. 194% (149%) for firms not able to manage EPS. This indicates that the market-to-book value for managing firms is less than that of the non-managing firms. The mean (median) for LEVERAGE for firms that are able to manage EPS is 30% (30%) vs. 26% (26%) for firms that are not able to manage EPS. This indicates that managing firms have higher leverage than non-managing firms. Managing firms have 30% of their assets financed vs. 26% for non-managing firms.

The mean (median) of the size (SIZE) of the managing firms is 8.95 (8.87) vs. 8.80 (8.70) for non-managing firms. The mean (median) for total assets for the managing firms is $22,622.21 ($7,164) million vs. $22,905.54 ($6,029.14) million for the non-managing firms. This shows that non-managing firms have more assets than managing firms.

The mean (median) of the cash flows for the managing firms is 11.86% (10.69%) vs. 11.27% (9.99%) for the non-managing firms. It shows that managing and non-managing firms have similar cash flows as a percentage of total assets. The median of the cash flows for both sub-samples is similar with a slight difference. The mean (median) of growth as measured by the change in log of sales (Δ LOGSALES) is similar for the managing and the non-managing firms, 0.05 (0.06) vs. 0.04 (0.03), respectively. However, there is a difference in the median for both sub-samples.

Capital expenditures for the managing firms and the non-managing firms have roughly similar means (medians) of 5.88% (4.66%) vs. 5.44% (4.45%), respectively. This indicates that capital expenditures in both sub-samples are around 5.5% of the firms' total assets. The values of the median are similar for the managing and the non-managing firms. Discretionary accruals' (DAC) mean (median) is similar for both the managing and the non-managing firms, 1.61% (-0.39%) vs. 1.55% (-0.30%). This

indicates that on average sample firms are managing accruals upward and the managing firms are manipulating the earnings through discretionary accruals slightly more than the non-managing firms.

The cost of debt capital's (CODC) mean (median) for the managing firms is 6.7% (6.72%) vs. 7.79% (7.79%) for the non-managing firms. This shows that non-managing firms pay on average 1% higher interest on their loans than managing firms. The mean (median) for E/P ratio for the managing firms is 9.67% (8.62%) vs. 3.26% (4.46%) for the non-managing firms. This shows that the market values stock of the managing firms three times higher than that of the non-managing firms.

DIFFERENCE IN THE MEANS OF SUB-SAMPLES VARIABLES

To examine the difference in the means of the variables for both sub-samples, I use a t-test to examine whether a difference exists between the means of the same variable for the managing and the non-managing firms. If a significant difference exists, then the variable is considered as a determinant of the firms that are able (not able) to manage EPS through share repurchases.

The differences in the mean of the variables between the two sub-samples are presented in table 3. The difference in the means of the level of change in the shares outstanding from the previous period (LEVELREPURCH) is significant with a t-value of 2.31 (p-value = 0.02). This indicates that non-managing firms repurchase more shares than managing firms. However, the percentage change in shares outstanding (REPURCH) is insignificant with a t-value of 1.37 (p-value = 0.17). The difference in the means for the level of the value of share repurchases (VALUEREPURCH) is significant with a t-value of 2.84 (p-value = 0.00). This indicates that non-managing firms' value of share repurchases is more than the value of share repurchases for the managing firms.

The difference in the means of the percentage change in the value of share repurchases (VALUEREP) is insignificant with a t-value of 0.43 (p-value = 0.66). This indicates that there is no significant difference between values of share repurchases for the managing firms and that of the non-managing firms. The difference in the means of market-to-book value (MVBV) is significant with a t-value of 11.63 (p-value = 0.00). This shows that the non-managing firms' MVBV is significantly greater than the managing firms' MVBV. The leverage (LEVERAGE) means difference is significant with a t-value of -4.36 (p-value = 0.00). This indicates that the managing firms are leveraged more than the non-managing firms.

The log of total assets (SIZE) means the difference is significant with a t-value of -1.77 (p-value = 0.07). This indicates that the managing firms are larger than the non-managing firms. The means difference for total assets (ASSETS) is insignificant with a t-value of 0.07 (p-value = 0.94). This indicates that on average, managing firms and non-managing firms have similar value of total assets. The means difference for cash flows (CFO) is insignificant with a t-value of -1.13 (p-value = 0.26). This implies that there is no difference in cash flows between managing firms and non-managing firms.

The results in table 3 show that there is no difference between the growth's means ($\Delta LOGSALES$) for the managing and the non-managing firms. This indicates that both types of firms have similar growth rates. The Capital expenditure (CAPEXP) means difference is insignificant with a t-value of -1.33 (p-value = 0.18). This indicates that both managing and non-managing firms have similar capital expenditures as a percentage of total assets. The difference in the means for discretionary accruals (DAC) is insignificant with a t-value of -0.05 (p-value = 0.96). This shows that both firms on average manipulate a similar portion of their discretionary accruals as a percentage of total assets.

The difference in the means of cost of debt capital (CODC) is significant with a t-value of 12.10 (p-value = 0.00). This indicates that non-managing firms pay more interest for their loans than managing firms. The Earnings-price ratio (E/P) means difference is significant with a t-value of -20.29 (p-value = 0.00). This shows that the E/P ratio is significantly higher for the managing firms than for the non-managing firms.

In summary, non-managing firms repurchase more of their shares than managing firms, the value of the repurchases is higher for the non-managing firms than that of the managing firms, market-to-book value of the non-managing firms is higher than that of the managing firms, and non-managing firms pay higher interest rate than managing firms. On the contrary, managing firms are more leveraged, larger in size, and have higher E/P ratio than that of the non-managing firms.

CONCLUSION

Prior research examines a variety of motives behind share repurchases (Dittmar 2000). Not until recently, Bens et al (2003) and Khaledi and Balsam (2003) among others examine whether managers manage EPS through share repurchases. Knowing the determinants of firms that are able to manage EPS through share repurchases, investors can make sound investment decisions based on the information available to them about the determinants of managing and non-managing firms. I report, as expected, that managing firms have higher earnings-price ratios. Consistent with Khaledi and Balsam (2003), I report that managing firms are larger. However, opposite to expectation, managing firms have higher leverage. This implies that managing firms use their resources inefficiently. Non-managing firms repurchase more shares. As expected, non-managing firms have higher market-to-book value (MVBV). Similar to Khaledi and Balsam (2003), I document that non-managing firms pay higher interest rates.

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Table 1

Sample Selection
Year 2000-2002

	Missing Observations	No. of Observations
Initial Sample		27,720
LESS: Observations with zero values and missing values	(18,932)	
		8,788
LESS: Missing Observations – Bond Rating	(7,575)	
Final sample used in the analysis		1,213

Table 2

Descriptive Statistics
Sample Year = 2000-2002

Variables	ABLE	N	Mean	Q1	Median	Q3	Max	S.D.
LEVELREPURCH ($)	1	350	4.96	-0.83	0.44	3.46	271.5	35.82
	0	863	15.71	-0.71	0.39	3.07	2112.70	124.60
REPURCH (%)	1	350	2.40	-0.75	0.34	2.14	71.26	9.46
	0	863	3.35	-0.32	0.28	1.45	137.84	13.98
VALUEREPURCH ($)	1	350	-3.06	-24.00	0.00	38.19	5666.00	762.07
	0	863	130.32	-19.00	0.00	75.34	6148.00	683.72
VALUEREP (%)	1	350	-0.14	-0.78	0.00	1.40	26.77	5.50
	0	863	0.00	-0.40	0.00	1.02	24.93	4.55
MVBV (%)	1	350	134.93	106.44	117.77	146.51	404.53	47.49
	0	863	194.92	117.73	149.23	220.37	1,685.09	131.96
LEVERAGE (%)	1	350	0.30	0.19	0.30	0.40	0.97	0.16
	0	863	0.26	0.14	0.26	0.36	0.90	0.15
SIZE	1	350	8.95	7.97	8.87	9.86	13.53	1.39
	0	863	8.80	7.77	8.70	9.70	13.70	1.42
ASSETS ($)	1	350	22,622.21	2,895.36	7,164.56	19,228.00	752249.00	60,670.88
	0	863	22,905.54	2,369.61	6,029.14	16,353.00	853,502.34	72,813.82
CFO (%)	1	350	11.86	7.05	10.69	14.86	40.98	8.35
	0	863	11.27	5.96	9.99	15.25	53.52	7.86
Δ LOGSALES	1	350	0.05	-0.03	0.06	0.17	1.72	0.28
	0	863	0.04	-0.03	0.03	0.12	3.63	0.26
CAPEXP (%)	1	350	5.88	2.27	4.66	7.60	32.45	5.39
	0	863	5.44	2.26	4.45	7.23	45.85	4.82
DAC (%)	1	350	1.61	-3.96	-0.39	3.48	248.55	21.65
	0	863	1.55	-5.27	-0.30	5.17	101.75	20.77
CODC (%)	1	350	6.70	5.24	6.72	7.86	9.94	1.45
	0	863	7.79	7.23	7.79	8.29	9.94	1.28
E/P (%)	1	350	9.67	7.50	8.62	10.92	30.95	3.64
	0	863	3.26	2.82	4.46	5.79	9.87	7.30

Table 3

Difference in Variable's Means for the Managing and the Non-Managing Firms

Variable	Mean[4]	t-value	Pr > t[5]
LEVELREPURCH	10.75	2.31	0.02**
REPURCH	0.95	1.37	0.17
VALUEREPURCH	133.39	2.84	0.00***
VALUEREP	0.14	0.43	0.66
MVBV	59.98	11.63	0.00***
LEVERAGE	-0.04	-4.36	0.00***
SIZE	-0.15	-1.77	0.07*
ASSETS	283.33	0.07	0.94
CFO	-0.58	-1.13	0.26
Δ LOGSALES	-0.00	-0.52	0.60
CAPEXP	-0.44	-1.33	0.18
DAC	-0.06	-0.05	0.96
CODC	1.08	12.10	0.00***
E/P	-6.40	-20.29	0.00***

[4] Mean of the non-managing firms minus the mean of the managing firms.
[5] ***, **, and * represents 1%, 5%, and 10% level of significance.