An empirical analysis of accounting conservatism surrounding share repurchases

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Abstract

This study examines the change of the agency-based demand for accounting conservatism surrounding share repurchases for a sample of US listed firms between 2003 and 2013. We find that the extent of accounting conservatism of repurchasing firms decreases significantly post share repurchase, supporting our contention that share repurchases reduce excess cash and consequently the agency-based demand for conservative accounting. This result holds for firms undervalued by the market (financially unconstrained firms and firms with low or no financial distress risk), but there is no significant decrease in accounting conservatism for firms overvalued by the managers (financially constrained firms or for firms with high financial distress risk). This supports the view that share repurchases of undervalued firms decreases information asymmetry and therefore reduces the agency-based demand for accounting conservatism from investors. However when firms are overvalued by managers, repurchasing shares cannot reduce the agency-based demand for accounting conservatism as investors continue to have concerns about managers overconfidence and reject the undervaluation signal of the share repurchase.

Introduction

This paper links share repurchases and accounting conservatism using an agency cost perspective. Due to the increased number of share repurchases in recent years, a number of papers have examined the motives and consequences of share repurchases (e.g. Chen & Wang, 2012). Also, recent research has shown accounting conservatism has a close association with a range of managerial financial decisions, including; cash distribution, investment, capital structure and debt maturity horizon (e.g. Zhang, 2008; Jayaraman & Shivakumar, 2013; Kang et al., 2016). However, to our knowledge, there is no empirical study examining the relation between the share repurchase decision and accounting conservatism, despite the fact that both accounting conservatism and share repurchases are connected to holding excess cash, information asymmetry and the resultant agency costs.

In this paper we use two common theoretical explanations for share repurchases and connect these to the demand for accounting conservatism through their impact on information asymmetry and agency costs. The first motive for share repurchase activity is that when a firm's capital exceeds the needs for its investment opportunities that have a positive net present value (NPV), the firm can either retain the excess cash or distribute it to shareholders. The argument that firms should not retain excess cash is based on increased agency costs (Easterbrook, 1984; Jensen, 1986). Repurchasing shares distributes excess capital to shareholders and therefore should reduce agency costs and the demand for accounting conservatism. A second popular explanation for share repurchases is that when managers in a firm believe that their shares are undervalued by market (information asymmetry on the value of the firm), they can use share repurchases as a signal to the market of their view (e.g. Comment & Jarrell, 1991; Rau & Vermaelen, 2002). As investors do not

have the managers' inside information, it is argued that information asymmetry increases agency costs (Myers & Majluf, 1984; Lie, 2005). When firms are "truly" undervalued, the signal transmitted by repurchasing shares reduces the information asymmetry and therefore should also reduce agency costs and the demand for accounting conservatism.

We suggest a relation between share repurchase activity and accounting conservatism due to the agency conflicts between shareholders and managers caused by the firm holding excess cash and information asymmetry on the "true" value of the firm. Watts (2003) contends that conservative accounting practices can alleviate agency problems. We expect that firms with excess cash have agency problems and therefore a high agency-based demand for accounting conservatism. Share repurchases can reduce excess cash holding and therefore would be expected to be associated with a reduction in the agency-based demand for conservative accounting in a comparison of accounting conservatism pre and post the share repurchase activity.

On the other hand in terms of the undervaluation motive for share repurchases, the impact of the share repurchase on the agency-based demand for accounting conservatism is less clear, due to potential disagreements on the "true" value of the firm and how investors view the signal in the share repurchase. Managers of a firm could decide to repurchase shares when they expect future operating performance to be better than the capital market expects (Lie, 2005). In this case where the firm is truly undervalued by market,[1] the demand for accounting conservatism caused by the information asymmetry (the market is not fully informed about firm's plan and potential performance in the future) is reduced as investors accept the signal in the repurchase. There is a reduction in the agency costs associated with the information asymmetry on the value of the firm

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[1] Lie (2005) describes that "[b]ecause the value of the stock is a function of future cash flow, differences in opinions regarding the value of the stock between managers and the capital market are likely due to differences in expectations of future operating performance. Consequently, managers will initiate share repurchase programs when they expect future operating performance to be better than what the capital market expects". In this paper we use the term "truly undervalued" to mean that the opinion/expectation of managers is true.

and the demand for accounting conservatism from investors. However, where the firm is overvalued by the managers, the demand for accounting conservatism is not reduced as investors do not accept the signal in the repurchase as they are concerned that manager's are overconfident in future performance and potentially will invest in negative NPV projects. Repurchasing shares in this case cannot reduce the agency costs of information asymmetry and eliminate the concerns from investors. Therefore it will not change the demand for accounting conservatism from investors in monitoring management post share repurchase.

Therefore we not only examine the relation between share repurchase activity and accounting conservatism, but also consider the characteristics of the firms making the repurchase decision to identify where there could be disagreements between managers and investors on the firm value. To identify "truly" undervalued firms we use measures of financial constraints and financial distress. If a repurchasing firm is classified as financially constrained and/or has high financial distress risk we suggest that these firms are not undervalued, but are overvalued by managers due to overconfidence in the future operating performance (see Chen & Wang, 2012). In these two types of firms, the repurchase decision is because of management's overvaluation and there are concerns for investors about poor investment projects or the distress risks of these projects. We predict a difference in the interpretation of the signal from the share repurchase for overvalued firms (financially constrained or with high financial distress) and for "truly" undervalued firms (financially unconstrained firms or firms with low/no financial distress risk).

Our sample is firms listed on the NYSE, Amex, or NASDAQ between 2003 and 2013,[2] excluding utilities and financial firms. We use the firm-specific asymmetric timeliness C-Score (Khan & Watts, 2009) to measure accounting conservatism, and the over/under valuation by using

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[2] We start our sample post Sarbanes-Oxley period to avoid confounding effects from the change in legal and regulatory requirements.

the KZ-Index (Kaplan & Zingales, 1997) to measure financial constraints, and the Altman's ZScore to measure the financial distress risk. Our results show that that the extent of accounting conservatism decreases significantly post share repurchase. However there are differences in the reduction in the extent of accounting conservatism in the repurchasing firms depending on the extent of disagreement on the value of the firm between managers and investors. Our overall result is robust, for "truly" undervalued firms (financially unconstrained firms or for firms with low/no financial risk) where accounting conservatism reduces significantly, however the change in accounting conservatism is not significant for overvalued firms (financially constrained repurchasing firms or for firms with high financial distress risk). Our results are in general consistent with the theory that share repurchases can reduce excess cash holdings and hence reduce the demand for accounting conservatism. They are also consistent with the perspective that the share repurchase can serve as a signal to reduce the asymmetric information between the insiders and the market, specifically, to reduce the agency-based demand for accounting conservatism for firms that are "truly" undervalued by the market.

This paper makes three contributions to the literature. Firstly, for the first time in our knowledge our study focuses on the consequences of share repurchases in terms of the changes in agency-based demand for accounting conservatism (rather than considering share repurchase and firm performance). Secondly, our findings that there are significant reduction in the extent of accounting conservatism associated with share repurchase activity provides evidence of a potential link between these two management decisions. Thirdly, prior research has shown accounting conservatism could be used to mitigate potential financial distress risk (Ahmed et al., 2002; Watts, 2003), and share repurchases are closely related to financial distress risk due to consumption of cash or increased borrowing, and decline in corporate liquidity (Stephens & Weisbach, 1998). Our results provide further evidence on the link between accounting conservatism and financial distress

risk.

The remainder of the article proceeds as follows: ''Literature Review and Hypotheses Development" section reviews relevant literature and develops our two testable hypotheses; "Research Design" section describes the research design and sample; "Results" section presents the descriptive statistics and the baseline regression results; "Robustness Checks" section summarizes the results of additional robustness tests; and "Conclusion" section presents our conclusions.

Literature Review and Hypotheses Development

Why do firms repurchase shares? Two of the main views on motives for repurchasing shares are to reduce excess capital and to correct undervaluation (Dittmar, 2000). In this section, we combine these two views with the agency-based demand for accounting conservatism to examine the link between the management decisions of repurchasing shares and adopting conservative accounting policies.

Share Repurchases and Accounting Conservatism - Excess Capital

When a firm's capital exceeds its investment opportunities, the firm can either retain the excess cash or distribute it to shareholders (Easterbrook, 1984; Jensen, 1986). Repurchasing shares and paying dividends are main methods to distribute excess capital to shareholders. Agency theory suggests that retaining excess cash can cause agency costs (Jensen, 1986). Accounting conservatism can mitigate agency costs of a firm in at least three ways: binding managers with other stakeholders, reducing asymmetry of information, and monitoring management investment policies and activities (Basu, 1997; Ball, 2001; Watts, 2003). In particular, Louis et al., (2012) point out that the market value of an additional dollar is less than one dollar for firms holding

excess cash and that accounting conservatism can mitigate the "value destruction" associated with excess cash holdings. Conservatism enables losses from poorly performing projects to be recognized early during a manager's tenure, which reduces manager's incentives to undertake negative NPV projects, as poor performance jeopardizes the manager's employment (Ball & Shivakumar, 2005). Accounting conservatism also allows directors and shareholders to receive early signals about the profitability of projects undertaken by managers. Such signals could enable them to intervene in a timely manner and take corrective actions, such as the abandonment of negative NPV projects or the replacement of the managers responsible for such projects (Watts, 2003). More specifically, accounting conservatism can provide incentives for *ex ante* efficient investment decisions, facilitate *ex post* monitoring of managers' investment decisions and, therefore, mitigate the value destruction associated with cash holdings (Louis et al., 2012). Therefore, shareholders of firms with excess cash holding demand more accounting conservative policies.

In summary, share repurchases can reduce the excess cash holdings of firms, which reduce the extent of agency conflicts, and the agency cost based demand for accounting conservatism. Therefore we suggest that repurchasing activity is associated with the decrease of the demand for accounting conservatism and formulate our first hypothesis as follows:

Hypothesis 1 (H1): Post share repurchase the agency-based demand for accounting conservatism is lower than pre share repurchase.

Share Repurchases and Accounting Conservatism - Undervaluation

Share repurchase not only occurs in firms with excess cash but can be strategically used by managers to correct the undervaluation of their shares based on the theory of asymmetric information between management and the market (Myers & Majluf, 1984). When managers

believe that their shares are undervalued, the firm can repurchase shares, which serves two purposes: as a signal to the market with the information that the insiders believe that the firm should be value higher and as a good investment project of buying its own shares at a cheap price. The positive share price reaction to share repurchases is consistent with the view of undervaluation (Dann, 1981; Comment & Jarrell, 1991).

However, there are two possibilities for firms using repurchasing activity to reduce information asymmetry on the valuation of the firm: firms that are "truly" undervalued by market, and for firms that are overvalued by managers.[3] As investors do not have inside information, it is argued that information asymmetry on the valuation of the firm would induce agency costs. For truly undervalued firms, the agency-based demand for accounting conservatism results from the markets lack of inside information rather than overconfidence or poor project selection by the firm. Share repurchase activity is seen as a favorable signal on future cash flows to investors and therefore as the information asymmetry on the true value of the firm is reduced the agency-based demand for accounting conservatism would decrease post share repurchases. On the contrary, for firms not truly undervalued by the market the managers could be overconfident and overvalue the NPV of the firms' investment projects. In this case the demand for accounting conservatism by investors results not only from information asymmetry on the true value of the firm, but also concerns on the firms' future projects. Therefore investors will not accept the undervaluation signal given by the repurchase activity as this will not reduce agency costs or eliminate their concerns on manager's overconfidence and potential poor project selection. The demand for accounting conservatism to monitor the management of these firms will not decrease post share repurchase.

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[3] We use the concept of "truly" undervalued in this paper from Lie (2005) to mean managers' better valuation is true. Lie (2005) states that "[i]f the stock is truly undervalued, share repurchase programs represent positive NPV projects that benefit shareholders" and that "… it is less likely that managers believe … that the shares are truly undervalued".

To proxy for overvaluation by managers we use two variables, financial constraints and financial distress risk. Firstly, managers of financially constrained repurchasing firms tend to be overconfident, and thus financially constrained firms tend to be overvalued by their managers (Chen & Wang, 2012). Secondly, for firms with high financial distress risk, the market concerns are mainly from uncertain financial conditions and poor project selection of the firms, which result from poor management and/or operating ability of the firms. Therefore, for a firm with high financial distress risk that wants to repurchase its shares, it is most likely the management of the firm underestimates the potential distress risks from their projects and hence overvalues the firm. The demand for accounting conservatism in the firms with high financial distress risks by shareholders is driven by the risks of default and high capital costs. Given that share repurchase activity on its own cannot improve a firms' financial conditions or management/operating ability, the demand for accounting conservatism will not reduce in these high financial distress firms post repurchase.

In summary, for financially constrained firms or firms with high distress risk, the undervaluation signal from repurchasing shares is not accepted by investors, significant information asymmetry remains and therefore there is little reduction in the agency-based demand for accounting conservatism. Our second testable hypothesis is as follows:

Hypothesis 2 (H2): The reduction in the agency-based demand for accounting conservatism associated with share repurchases is greater for "truly" undervalued (financially unconstrained or with low/no financial distress risk) firms than overvalued (financially constrained or with high financial risk) firms.

Research Design

This section describes our measures of accounting conservatism, measures of over/undervaluation (financial constraints and financial distress risk), and the definitions of our other variables. We also report the process of sampling and screening of the data used in the empirical tests.

Measure of Accounting Conservatism

We measure accounting conservatism by the firm-specific asymmetric timeliness score developed by Khan and Watts (2009), i.e. firm-specific estimation of the timeliness of good news (G-Score) and bad news (C-Score). The higher C-score represents greater use of accounting conservatism. The G-Score and C-Score are estimated through the following equations.

Equation (1) is the Basu (1997) model as defined in equation (1) as follows:

$$NI = \beta_0 + \beta_1 DR + \beta_2 R + \beta_3 DR*R + \varepsilon. \qquad\qquad (1)$$

where subscripts firm i and year t are omitted for simplicity. *NI* is the net income before extraordinary items for firm i and year t deflated by the beginning-of-year market value, R is the stock return for firm i over the fiscal year t, and *DR* is a dummy variable that equals 1 if R is less than zero, and 0 otherwise. Equations (2) and equation (3) are specified for G-Score and C-Score as follows:

$$G\text{-}Score = \beta_2 = \mu_1 + \mu_2 MV + \mu_3 MTB + \mu_4 LEV. \qquad\qquad (2)$$

$$C\text{-}Score = \beta_3 = \lambda_1 + \lambda_2 MV + \lambda_3 MTB + \lambda_4 LEV. \qquad\qquad (3)$$

where *MV* is the logarithm of the market value of equity, *MTB* is market-value of equity divided by the book value of equity, and *LEV* is total debt divided by total assets. Replacing β_2 and β_3 from equations (2) and (3) in regression equation (1), we get equation (4) as follows:

$$NI = \beta_0 + \beta_1 DR + (\mu_1 + \mu_2 MV + \mu_3 MTB + \mu_4 LEV)R + (\lambda_1 + \lambda_2 MV + \lambda_3 MTB + \lambda_4 LEV)DR*R$$

$$\square(\square_1 MV \square\square_2 MTB \square\square_3 LEV \square\square_4 D*MV \square\square_5 D*MTB \square\square_6 D*LEV) \square\square. \qquad (4)$$ The

estimates from equation (4) are applied to equation (3) to obtain the firm-specific conservatism

measures (C-Score).

Measure of Financial Constraint

We use the KZ index (Kaplan & Zingales, 1997) to measure a firm's financial constraint (see

Hennessy et al., 2007; Chen & Wang, 2012). A firm with a high KZ index is considered more

financially constrained. We construct the KZ index for each firm-year by using equation (5), in

which

the subscripts for firm *i* and year *t* are omitted for simplicity:

$$KZ \square\square 1.002(CF/TA) \square 39.368(DIV/TA) \square 1.315(CA/TA) \square 3.139 LEV \square 0.283 MB \qquad (5)$$

where *CF/TA* is cash flow divided by lagged book assets, *DIV/TA* is cash dividends divided by

lagged book assets, *CA/TA* is cash balances divided by lagged book assets, *LEV* is total debt over

total

assets, and *MB* is the ratio of the market-to-book value of the firm's assets.

Measure of Financial Distress Risk

We use the Altman (1968) Z-Score to measure financial distress risk. The Z-Score is computed in

equation (6) as follows:

$$Z\square Score \square 1.2 X_1 \square 1.4 X_2 \square 3.3 X_3 \square 0.6 X_4 \square 0.999 X_5 \qquad (6)$$

where X_1 is working capital divided by book assets; X_2 is retained earnings divided by book assets; X_3 is earnings before interest and taxes divided by book assets; X_4 is market value of equity divided by total liabilities; and X_5 is net sales divided by book assets.[4]

Control Variables

Following previous studies (e.g. Lie, 2005; Goh & Li, 2011), we include three control variables: firm size, leverage and market-to-book ratio. *SIZE* is the natural logarithm of total assets at the beginning of the fiscal year, *MB* is calculated as the market value of equity divided by the book value of equity at the beginning of the fiscal year, and *LEV* is total debt divided by total assets at the beginning of the fiscal year.

Sample and Data

We collect data on US firms listed on the NYSE, Amex, or NASDAQ between 2003 and 2013, and exclude utilities and financial firms. The accounting and finance data are retrieved from Datastream. Firm-years with missing data for the variables used in estimation and firm-years with negative total assets or book value of equity are deleted (e.g. Kahn & Watts, 2009). Outlier observations for the continuous variables at the top and bottom 1% levels are also removed to eliminate the influence of extreme values. We follow the approach in Fama and French (2001) and measure share repurchases as net repurchases.[5] We identify 1449 repurchasing firms over the period 2003 to 2013.[6] To test hypotheses of H1 and H2, firms are required to have data for at least

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[4] If the Z-score is greater than 3.0, the firm is unlikely to default, between 1.8 and 2.7 there is a good chance of default and less than 1.8, the firm is viewed as failing.

[5] They use the increase in common treasury stock if the firm uses the treasury stock method for repurchases. If the firm uses the retirement method instead and this manifests as zero (or missing) in treasury stock in the current and prior year, we measure repurchases as the difference between stock repurchases and stock issuances. If either of these amounts is negative, repurchases are set to zero.

[6] The number of repurchasing firms in our sample is consistent with previous studies (see Chen & Wang, 2012). The number of observations in the tests in the following sections may vary depending on further data requirements.

three consecutive years to calculate C-Scores in the year before and in the year after the share repurchase to capture the change.

To test H2 using financial constraint as proxy for under/overvaluation, we split the repurchasing firms into two groups, i.e. financially constrained and financially unconstrained repurchasing firms. For every year of data, we sort all the firms in the sample from highest to lowest according to the value of their KZ index, and categorize firms with a KZ index in the top quartile as financially constrained, and the other firms as financially unconstrained firms.[7] We classify 354 firms as financially constrained over our sample period. Also to test H2, but using financial distress as the proxy for under/overvaluation, we split the repurchasing firms into two groups, firms with high financial distress risk and firms with low/no financial risk. For every year of data, we sort all the firms in the sample from highest to lowest according to the value of their Z-Score and select the lowest quartile group of firms as the high financial distress risk group.[8] Other firms are categorized as firms with low/no financial distress risk. Over our sample period we classify 311 firms as having high financial risk (57 firms were in both our overvaluation classifications).

Results

Descriptive Statistics

Table 1 presents the descriptive statistics of the main variables and control variables - including C-Score, KZ-Index, Z-Score, Size (logarithm of total asset), Lev (leverage), and MB (market-tobook ratio). Panel A, Panel B and Panel C present the results for all firms versus repurchasing firms,

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[7] Our overall results are qualitatively similar when the cutoff point of K-Score is top 20% or top 10%.
[8] We also use 1.8 as the cut-off point of Z-Score to define firms with high financial distress risk. The results are qualitatively similar.

financial constrained versus unconstrained repurchasing firms, and repurchasing firms with high financial distress risk versus low/no distress risk respectively. The mean and the median of C-scores of overvalued firms (financially constrained or with high financial distress risk) are lower than financially unconstrained firms (significant at the 5% level) and firms with low/no financial distress risk (significant at the 1% level) respectively. This provides some initial univariate support that overconfident managers are less accounting conservative (e.g. Ahmed & Duellman, 2013).

<Insert Table 1 here>

Table 2 presents the mean of C-Score of one year before and one year after the repurchasing activity, and the change in the C-Score. Panel A shows that for all repurchasing firms, the mean of C-Score in one year after share repurchase reduces by 0.023 (17.7%) compared with one year before share repurchase (significant at the 1% level). The result means that firms on average reduce their accounting conservative policies significantly after share repurchase activity, providing initial support of H1.

Panel B and Panel C of Table 2 split the sample on our measures of over/under valuation using measures of financial constraint and financial distress respectively. Panel B shows that for "truly" undervalued firms (financially unconstrained), the C-Score reduces by 0.027 (19.3%) one year after the share repurchase (significant at the 1% level), but for overvalued firms (financially constrained) the C-Score reduces, but the difference is insignificant. Panel C of Table 3 shows that for "truly" undervalued (low/no financial distress risk), the C-Score reduces by 0.03 (21.6%) one year after the share repurchase (significant at the 1% level), but for overvalued firms (high financial distress risk), the C-Score increases by an insignificant 0.005 (5.3%). These results provide some initial support of H2.

For comparison we also examine the C-Score of non-repurchasing firms. Due to the high number and multiple share repurchase during the sample period to have a clear comparison, a firm is categorized as non-repurchasing firm if the firm does not repurchase shares at all in the whole sample period. For each non-repurchasing firm, we identify a repurchasing firm that matches with the non-repurchasing firm in terms of our control variables (size, leverage and market-to-book ratio), and use the year t of the repurchasing firm as the repurchase year of the non-repurchasing firms.[9] We also use the same criteria for repurchasing firms to split the non-repurchasing firms into financially constrained or unconstrained firms and firms with high or low/no distress risk.

Panel A in Table 3 presents the results for non-repurchasing firms, and shows there is no significant change in the C-Scores before and after the year when the matched repurchasing firms repurchase their shares. For our analysis of the under valuation signal from the share repurchase, Panels B and C of Table 3 show that for financially constrained or unconstrained non-repurchasing firms and for non-repurchasing firms with high or low/no distress risk, there is no significant change in the C-Scores before and after the year when the matched repurchasing firms repurchase shares. Subject to the caveat of small sample size these results support our finding of the reduction in the agency-based demand for accounting conservatism is associated with share repurchases.

<Insert Table 2 here>

<Insert Table 3 here>

Cross-sectional regression analysis

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[9] Specifically, we split our sample into quartiles based on the level of size, leverage and market-to-book ratio respectively, and obtain 64 groups in total. Then, for each non-repurchasing firm we select a repurchasing firm in the same group as the matched firm. This selection criterion does mean that we have small numbers in some of the subgroups of our analysis.

In this section we conduct a cross-sectional analysis of the C-score. The basic model is specified as follows:

$$C\text{-}Score = \beta_0 + \beta_1 Dummy + \beta_2 Size + \beta_3 LEV + \beta_4 MB + YearDummy + \varepsilon. \qquad (7)$$

where subscripts firm i and year t are omitted for simplicity. *Dummy* is a dummy variable that equals 1 if one year before repurchase, and 0 if one year after repurchase. Other variables are defined in "Research Design" – *Control Variables* section. A Year Dummy (*YearDummy*) variable is also added to control for time fixed effect. In equation (7), for our three groups of firms in H1 and H2 we predict that β_1 is positive.

Table 4 presents the cross-sectional regression results. Panel A shows that the coefficient on *Dummy* is positive (0.023) and significant at the 1% level, implying that the accounting conservatism one year after the share repurchase is significantly lower than one year before the share repurchase, supporting H1. Panel B presents the change in accounting conservatism from one year before to one year after share repurchase for over/under valued firms (classified by financially constrained repurchasing versus unconstrained repurchasing firms). The coefficient on *Dummy* is positive (0.027) and significant at the 1% level for financially unconstrained repurchasing firms, but insignificantly positive (0.012) for financially constrained repurchasing firms. This result shows that accounting conservatism in financially unconstrained repurchasing firms significantly lowers post repurchase but not for financially constrained repurchasing firms, which supports H2. Panel C presents the changes of accounting conservatism from one year before share repurchases to one year after share repurchase for over/under valued repurchasing firms (classified by high financial distress risk versus low/no financial distress risk firms). It shows the coefficient on *Dummy*, is positive (0.030) and significant at the 1% level for repurchasing firms

with low/no financial distress firms, but insignificantly negative (0.005) for repurchasing firms with high financial distress risk, implying that accounting conservatism in repurchasing firms with low/no financial distress risk lowers significantly after the repurchase, but it is not the case for repurchasing firms with high financial distress risk. This also provides support for H2.

<Insert Table 4 here>

In summary our results show that that the extent of accounting conservatism decreases significantly post share repurchase. However there are differences in the reduction in the extent of accounting conservatism in the repurchasing firms depending on the extent of disagreement on the value of the firm between managers and investors. Our results are in general consistent with the theory that share repurchase can reduce excess cash holdings and hence reduce the demand for accounting conservatism. They are also consistent with the perspective that share repurchase can serve as a signal to transfer favorable inside management information reducing the agency-based demand for accounting conservatism caused by information asymmetry but only for firms that are "truly" undervalued by market.

Robustness Checks

Controlling for Dividends

Dividends payment and share repurchases are closely related to each other as either can be used to distribute free cash flows (Skinner, 2008). Also it has been found that accounting conservatism plays a role in the bondholder-shareholder conflict over dividend and debt cost (Ahmed et al., 2002). To address the concern that dividends payment can affect the extent of accounting conservatism, we include the variable of *Div*, defined as dividend payout over total asset at the beginning of the year, in the regression equation (7).

It can be seen from Table 5 that the results after controlling for the possible effect of dividends payment are similar to the results in Table 4. The coefficient on *Dummy* remains significantly positive in the analysis of all repurchasing firms, undervalued firms (financially unconstrained or with low/no financial distress risk), but insignificant in the analysis of overvalued firms (financially constrained or with high financial distress risk).[10]

<Insert Table 5 here>

Controlling for New Debt Issues

Assuming that an optimal leverage ratio exists, repurchasing shares is a strategy of achieving the optimal ratio as it will increase the leverage ratio (Hovakimian et al., 2001). Firms can also increase their leverage ratio by issuing new debt. In addition, a recent study finds the relation between accounting conservatism and debt issue and maturity (Kang et al., 2016). Therefore we control for new debt issues and include the dummy variable of *DDebt,* which equals 1 if firms' long term debt increases in the repurchase year and 0 otherwise, in the regression equation (7).

Table 6 shows that the results after controlling for the possible effect of new debt issuance are similar to the results in Table 4. The coefficient on *Dummy* remains significantly positive in the analysis of all repurchasing firms, overvalued firms (financially unconstrained or with low/no financial distress risk), but insignificant in the analysis of overvalued firms (financial constrained or with high financial distress risk).

<Insert Table 6 here>

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[10] We also control for industry fixed effects by including industry dummies, *Industry*, in the regression estimation, equation (7). The results after controlling for the possible effect of industry are qualitatively similar to the baseline results (available from the authors on request).

Conclusion

Using a sample of US listed firms between 2003 and 2013, we explore the association of the change of the agency-based demand for accounting conservatism surrounding share repurchases. Firms with excess cash potentially incur higher agency costs and this increases the demand for accounting conservatism to monitor managers, but share repurchases can reduce excess cash and so can reduce the demand for accounting conservatism. Therefore, we predict lower levels of accounting conservatism for firms that repurchase their shares in the period post share repurchase. Empirically, we find support for our prediction as accounting conservatism post repurchase is significantly lower than the year prior to the repurchase for our sample of repurchasing firms.

A second common explanation for share repurchases is that managers want to signal their shares are undervalued. As investors do not have inside information, the higher the information asymmetry on the true value of the firm will increase agency costs and investors would demand more accounting conservative policies. However, we suggest that share repurchases can only reduce the agency-based demand for accounting conservatism of "truly" undervalued firms where the undervaluation is caused by asymmetric information between the insiders and the market and this is reduced as investors accept the undervaluation signal. However share repurchases will not reduce conservatism for firms where the firm is not truly undervalued but overvalued by the managers due to manager's overconfidence and potential poor projects held by the firm. We identify firms where there is disagreement on their valuation based on their financial constraints and level of financial distress risk. We predict that accounting conservatism where this disagreement exists and the managers overvalue their shares would not substantially reduce post share repurchases as investors do not accept the undervaluation signal and information asymmetry is not reduced. Our empirical results support our prediction. We find that the reduction in

accounting conservatism in truly undervalued firms (financially unconstrained or with low/no financial risk firms) is significant post repurchase, but not significant in overvalued (financially constrained or with high financial risk) firms. These findings are also robust when we control dividend payment and new debt issuance.

We caution that this study aims at exploring the association between share repurchases and accounting conservatism but not developing causal relations which might be important. Moreover, this study samples US firms in the post Sarbanes-Oxley period with the resultant tightened legal and regulatory requirements. Whether the results can be generalized to other periods or other countries are potential avenues for future studies.

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Table

1: Descriptive statistics

Panel A:	All Firms			urchasing		
variable	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation
CScore	0.14	0.13	0.17	0.11	0.08	0.21
KZ	0.54	0.56	1.28	0.55	0.53	1.02
ZScore	4.32	3.69	2.63	4.26	3.77	2.29
SIZE	20.61	20.59	1.71	21.13	21.42	1.83
LEV	0.18	0.17	0.16	0.18	0.17	0.14
MB	2.82	2.13	4.58	2.80	2.38	1.79
N	6490			1449		

Panel B:	Financially Constrained Repurchasing Firms			Financially Unconstrained Repurchasing Firms			Wilcoxon (*p*-value)
variable	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	
CScore	0.09	0.01	0.22	0.12	0.09	0.20	(0.025)
KZ	1.72	1.53	0.63	0.17	0.31	0.82	(<.0001)
ZScore	3.66	3.15	2.15	4.46	3.93	2.30	(<.0001)
SIZE	21.25	21.51	1.61	21.09	21.32	1.90	(0.209)
LEV	0.31	0.32	0.14	0.14	0.13	0.12	(<.0001)
MB	3.85	3.38	2.30	2.46	2.10	1.43	(<.0001)
N	354			1095			

Panel C:	Repurchasing Firms with High Distress Risk			Repurchasing Firms with Low Distress Risk			Wilcoxon (*p*-value)
variable	Mean	Median	Std. Deviation	Mean	Median	Std. Deviation	
CScore	0.07	0.00	0.21	0.12	0.09	0.21	(<.0001)
KZ	0.94	0.91	1.00	0.44	0.42	1.00	(<.0001)
ZScore	1.93	2.04	0.59	4.90	4.29	2.16	(<.0001)
SIZE	21.77	21.93	1.72	20.95	21.28	1.83	(<.0001)
LEV	0.29	0.29	0.14	0.15	0.14	0.13	(<.0001)
MB	2.31	1.91	1.51	2.93	2.55	1.83	(<.0001)
N	311			1144			

Table 1 presents the descriptive statistics of the main variables and control variables. The sample period is from 2003 to 2013. *CScore* is the C-Score for each firm-year as specified in Equation (3). Higher C-Score indicates more conservatism. *KZ* is the KZ index for each firm-year as defined in Equation (5). For every year of data, we sort all the firms in our sample into quartiles according to their KZ indexes. Firms in the top quartile (higher KZ indexes) are defined to be financially constrained and firms in other quartiles to be financially unconstrained. *ZScore* is the Altman ZScore for each firm-year as specified in Equation (6). For every year of data, we sort all the firms in our

Table

sample into quartiles according to their Z-Scores. Firms in the lower quartile (lower Z-Scores) are defined to be with high distress risk and firms in other quartiles to be with low/no distress risk. *SIZE* is the natural logarithm of total assets at the beginning of the fiscal year, *MB* is calculated as the market value of equity divided by the book value of equity at the beginning of the fiscal year, and *LEV* is total debt divided by total assets at the beginning of the fiscal year.

2: C-Score change after repurchase year for repurchase sample

Panel A:	All Repurchasing Firms					
CScore	Year-1	Year+1	Change			
Mean	0.130	0.107	-0.023***			
t-value			(-3.34)			
N	1449					

Panel B:	Financially Constrained Repurchasing Firms			Financially Unconstrained Repurchasing Firms		
CScore	Year-1	Year+1	Change			
Mean	0.098	0.086	-0.012	0.140	0.113	-0.027***
t-value			(-0.86)			(-3.35)
N	354			1095		

Panel C:	Repurchasing Firms with High Distress Risk			Repurchasing Firms with Low Distress Risk		
CScore	Year-1	Year+1	Change			
Mean	0.095	0.100	0.005	0.139	0.109	-0.030***
t-value			(0.31)			(-3.96)
N	311			1144		

Table 2 presents the mean of C-Score of one year before and one year after the repurchasing activity as well as the change of C-Scores. The categories of firms are as defined in Table 1.

***, ** and * represent significance at the 1%, 5% and 10% level respectively.

3: C-Score change for matched sample of non-repurchasing firms

Panel A:	Non-Repurchasing Firms		
CScore	Year-1	Year+1	Change
Mean	0.177	0.164	-0.013
t-value			(-0.53)
N	64		

Table

Panel B:	Financially Constrained Non-Repurchasing Firms			Financially Unconstrained Non-Repurchasing Firms		
CScore	Year-1	Year+1	Change			
Mean	0.081	0.170	0.089	0.187	0.164	-0.024
t-value			(1.36)			(-0.90)
N	6			58		
Panel C:	Non-Repurchasing Firms with High Distress Risk			Non-Repurchasing Firms with Low Distress Risk		
CScore	Year-1	Year+1	Change			
Mean	0.147	0.180	0.032	0.186	0.160	-0.026
t-value			(0.48)			(-1.00)
N	14			50		

A firm is categorized as non-repurchasing firm if the firm does not repurchase shares in the sample period. For each non-repurchasing firm, we identify a repurchasing firm that matches with the nonrepurchasing firm in terms of size, leverage and market-to-book ratio, and use the year *t* of the repurchasing firm as the repurchase year of the non-repurchasing firms. We also apply the same criteria for repurchasing firms to split the non-repurchasing firms into financially constrained or unconstrained firms and firms with high or low/no distress risk. Table 3 presents the mean of CScores and change in the C-Scores before and after the year when the matched repurchasing firms repurchase shares.

4: Cross-sectional regression analysis: Accounting conservatism surrounding share repurchases

Dependent Variable: C-Score					
Panel A:	All Repurchasing Firms				
	Coefficient	t-value			
Intercept	0.690***	18.58			
Dummy	0.023***	4.12			
Size	-0.027***	-14.67			
Lev	-0.055**	-2.55			
MB	-0.007***	-4.51			
Year	Yes				
Adj. R^2 (%)	39.6				
N	2898				
Panel B:	Financially Constrained Repurchasing Firms		Financially Unconstrained Repurchasing Firms		
	Coefficient	t-value		Coefficient	t-value

Table

	Coefficient	t-value	Coefficient	t-value
Intercept	0.612***	7.17	0.713***	16.31
Dummy	0.012	1.08	0.027***	4.15
Size	-0.025***	-6.46	-0.028***	-12.54
Lev	-0.010	-0.23	-0.024	-0.72
MB	-0.005**	-2.16	-0.007**	-2.53
Year	Yes		Yes	
Adj. R^2 (%)	45.3		38.5	
N	708		2190	
Panel C:	Repurchasing Firms with High Financial Distress Risk		Repurchasing Firms with Low Financial Distress Risk	
	Coefficient	t-value	Coefficient	t-value
Intercept	0.773***	8.85	0.670***	16.20
Dummy	-0.005	-0.39	0.030***	4.90
Size	-0.029***	-7.22	-0.027***	-12.77
Lev	-0.045	-0.95	-0.068**	-2.52
MB	-0.009**	-2.01	-0.006***	-3.67
Year	Yes		Yes	
Adj. R^2 (%)	41.1		40.0	
N	622		2288	

Table 4 presents the cross-sectional regression analysis results. *Dummy* is a dummy variable that equals 1 if it is one year before repurchase, and 0 if it is one year after repurchase. *Year* is a year dummy variable to control for time fixed effect. Other variables are as defined in Table 1. The sample period is from 2003 to 2013. The t-statistics are computed with heteroskedasticity consistent standard errors (White, 1980). ***, ** and * represent significance at the 1%, 5% and 10% level respectively.

Table 5: Robust check (controlling for dividend payment): Accounting Conservatism surrounding share repurchases

	Dependent Variable: C-Score			
Panel A:	All Repurchasing Firms			
	Coefficient	t-value		
Intercept	0.686***	18.43		
Dummy	0.023***	4.12		
Size	-0.027***	-14.37		
Lev	-0.056**	-2.57		
MB	-0.007***	-4.44		
Div	-0.152	-1.19		
Year	Yes			
Adj. R^2 (%)	39.6			
N	2898			
Panel B:	Financially Constrained Repurchasing Firms		Financially Unconstrained Repurchasing Firms	
	Coefficient	t-value	Coefficient	t-value
Intercept	0.600***	6.89	0.712***	16.29
Dummy	0.012	1.08	0.027***	4.15
Size	-0.024***	-6.16	-0.028***	-12.45
Lev	-0.005	-0.12	-0.015	-0.45
MB	-0.005*	-1.92	-0.006**	-2.23
Div	-0.495	-0.8	-0.250*	-1.89
Year	Yes		Yes	
Adj. R^2 (%)	45.2		38.6	
N	708		2190	
Panel C:	Repurchasing Firms with High Financial Distress Risk		Repurchasing Firms with Low Financial Distress Risk	
	Coefficient	t-value	Coefficient	t-value
Intercept	0.765***	8.73	0.671***	16.12
Dummy	-0.005	-0.39	0.031***	5.00
Size	-0.029***	-7.06	-0.027***	-12.57
Lev	-0.043	-0.91	-0.068**	-2.51
MB	-0.009**	-1.96	-0.006***	-3.67
Div	-0.209	-0.88	-0.043	-0.27
Year	Yes		Yes	
Adj. R^2 (%)	41.1		40.1	
N	622		2288	

Table 5 presents the cross-sectional regression analysis results controlling for dividend payout. *Div* is the defined as dividend payout over total asset at the beginning of the year. Other variables are as defined in Table 4. The sample period is from 2003 to 2013. The t-statistics are computed with heteroskedasticity consistent standard errors (White, 1980). ***, ** and * represent significance at the 1%, 5% and 10% level respectively.

Table 6: Robust check (controlling for debt increase): Accounting conservatism surrounding share repurchases

	Dependent Variable: C-Score			
Panel A:	All Repurchasing Firms			
	Coefficient	t-value		
Intercept	0.690***	18.57		
Dummy	0.023***	4.12		
Size	-0.027***	-14.62		
Lev	-0.056**	-2.55		
MB	-0.007***	-4.51		
DDebt	0.001	0.14		
Year	Yes			
Adj. R^2 (%)	39.6			
N	2898			
Panel B:	Financially Constrained Repurchasing Firms		Financially Unconstrained Repurchasing Firms	
	Coefficient	t-value	Coefficient	t-value
Intercept	0.595***	7.00	0.712***	16.23
Dummy	0.012	1.09	0.027***	4.15
Size	-0.025***	-6.42	-0.028***	-12.42
Lev	-0.002	-0.06	-0.024	-0.72
MB	-0.005**	-2.06	-0.007**	-2.53
DDebt	0.013	1.16	-0.001	-0.14
Year	Yes		Yes	
Adj. R^2 (%)	45.3		38.5	
N	708		2190	
Panel C:	Repurchasing Firms with High Financial Distress Risk		Repurchasing Firms with Low Financial Distress Risk	
	Coefficient	t-value	Coefficient	t-value
Intercept	0.775***	8.90	0.672***	16.19
Dummy	-0.005	-0.39	0.031***	5.00
Size	-0.029***	-7.26	-0.027***	-12.75
Lev	-0.045	-0.97	-0.068**	-2.50
MB	-0.009**	-2.01	-0.007***	-3.67
DDebt	-0.002	-0.16	0.000	-0.02

Year	Yes	Yes
Adj. R^2 (%)	41.0	40.1
N	622	2288

Table 6 presents the cross-sectional regression analysis results controlling for any debt issuance. *DDebt* is a dummy variable that equals 1 if firms' long term debt increases in the repurchase and 0 otherwise. Other variables are as defined in Table 4. The sample period is from 2003 to 2013. The t-statistics are computed with heteroskedasticity consistent standard errors (White, 1980). ***, ** and * represent significance at the 1%, 5% and 10% level respectively.