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## Do firms follow GAAP when they record share repurchases?

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### ABSTRACT

This paper examines U.S. firms' accounting for share repurchases and the accounting choice provided to Delaware-incorporated firms between the treasury and retirement methods. This accounting choice does not affect income, cash flows, or net assets, but it nevertheless affects financial reporting transparency and the allocation of equity between retained earnings and contributed capital. According to Generally Accepted Accounting Principles (GAAP), the accounting choice to record share repurchases should reflect management's intended disposition of the repurchased shares. We compare characteristics of Delaware-incorporated treasury and retirement firms and find that the choice between the two accounting methods is not always consistent with GAAP, but neither is it random; rather, this choice is related to a number of firm characteristics including firm growth, industry membership, trading exchange, and price–earnings ratio. We also find that a firm's accounting method for share repurchases is associated with a firm's propensity to make future share repurchases.

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### 1. Introduction

Share repurchases have become an important component of corporate payout policy. According to a 2016 *Wall Street Journal* article: “Since 1985, corporations have repurchased about \$6.6 trillion of their own stock,” and “in 2015, there were \$831 billion of buybacks authorized, the second-biggest dollar amount ever ... Initial estimates of the money actually spent on the buybacks [in 2015] was about \$583 billion” (Driebusch, 2016). DeAngelo, DeAngelo, and Skinner (2009) identify eight advantages of repurchases over dividends that include the following five: potential tax savings to shareholders; greater financial flexibility for the company because there is no implied promise to continue payouts in the future; the ability to correct the market's undervaluation of the company's stock; the reporting of higher earnings per share; and removal of “low valuation” investors from the stockholder pool to reduce the likelihood of an unwanted takeover (p. 237).

A mature empirical finance literature has evolved to examine these economic motivations, transaction structure, methods, market reactions, signaling effectiveness, and efficiency of share repurchases. However, there is a paucity of research examining how firms report information about these transactions to shareholders and whether the firm presents the information in a format consistent with the firm's economic motivation for the share repurchase. This paper seeks to fill this gap in the literature and finds systematic differences in firm characteristics related to the accounting method a firm chooses to report share repurchase transactions. We find the firm's accounting choice is related

to the firm's financial motivation for repurchasing shares as well as the likelihood that the firm engages in future repurchases.

If firms follow generally accepted accounting principles (GAAP), then the accounting treatment for share repurchases depends on the firm's intended purpose for the repurchased shares. Treasury stock holdings are viewed as temporary and treasury stock transactions do not affect retained earnings. If a treasury stock account is used, the repurchase represents the first step in a transfer of equity among shareholders. The company mediates this equity transfer and holds the shares temporarily as an unallocated reduction in common equity. Since the firm reports treasury stock separately in stockholders' equity and provides both the number of shares held and the cumulative cost of these shares, external stakeholders can easily determine the cumulative economic effect of the firm's repurchase programs and assess the likelihood that the firm will complete the transfer and reissue the shares. The retirement method, however, is viewed conceptually as a distribution to shareholders similar to dividends, and thus, usually results in a reduction of retained earnings.<sup>1</sup> Under both methods, the repurchase transaction's impact on the firm's book value of equity and earnings per share is the same. Apart from the financial reporting differences, there are potential economic implications of the accounting

<sup>1</sup> ASC 505-30-30-8 indicates that the excess of repurchase price over par value may be allocated between retained earnings and additional paid in capital (APIC) or entirely against retained earnings. However, in practice, many firms use ARB 43, Chapter 1B, paragraph 7 to support the allocation of the excess cost over stated value to APIC first, with additional amounts taken against retained earnings once the capital surplus is depleted. Thus, it is possible for a firm using the retirement method to record share repurchase transactions without reducing retained earnings by allocating the entire purchase cost against existing capital surplus.

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method as well, since firms may use treasury shares as currency in future corporate transactions.

In this paper, we examine a firm's choice to account for share repurchases. Prior research examining management's choice among accounting methods indicates that management may use the discretion allowed by GAAP to communicate transactions using the accounting method that most efficiently conveys management's private information to shareholders. Alternatively, management may opportunistically elect the accounting method that provides a greater benefit to the manager or to the firm. To understand the economic determinants of this accounting choice, we compare the firm characteristics of two groups of Delaware-repurchasing firms, one group holding shares in treasury and the other group retiring all repurchased shares.<sup>2</sup>

First, we explore the characteristics of firms that switch from the treasury method to the retirement method or vice versa. We find that only 6% of Delaware firms switched accounting methods over the twenty-year sample period indicating that the method initially chosen to communicate share repurchases seldom changes. We examine this small subset of switching firms using a conditional fixed effect logit model that controls for firm characteristics related to share repurchase transactions. We find only the size of the repurchase itself affects the likelihood that a firm switches to the treasury method.

Since the choice of accounting method appears sticky, we next examine the firm characteristics related to the method choice for the full sample of Delaware repurchasing firms. We find that the accounting method used to account for share repurchase activities appears neither fully consistent with the guidance provided by GAAP nor random. While we find evidence that this choice appears related to certain firm characteristics suggested by prior literature as related to the firm's underlying motivation to make share repurchases, we do not always find that the firm's choice of accounting method clearly reflects the intended permanence of the shares repurchased in accordance with GAAP. However, firms that appear to engage in share repurchase activities for more opportunistic motivations are more likely to constructively retire the shares, resulting in less transparent communication of their repurchase activities.

When the SEC enacted changes to the disclosure requirements of Rule 10b-18 effective in 2004, we note several significant changes in the characteristics of firms initiating either the treasury or retirement methods. After enhanced disclosures provide investors with more detailed information about the firm's monthly repurchase transactions, retire firms are no longer distinguishable from treasury firms in their growth prospects or need for shares as currency in future acquisition transactions. Before the disclosure regime change, retire firms were more likely to make inefficient repurchase transactions and hold lower cash balances; after the disclosure regime change, however, we find retire firms seem more characteristic of firms making permanent returns of capital to investors, consistent with GAAP.

We find that the method used to report share repurchases is related to such firm characteristics as growth, industry membership, price to earnings ratio, and market to book ratio. These findings invite an empirical examination of the relationship between a firm's repurchase accounting method and the firm's propensity to make future repurchase transactions. We estimate a logit model of the likelihood that a firm engages in a share repurchase transaction in any given year. Even after controlling for firm characteristics related to share repurchase activities, we find that the accounting method indicator variables are

<sup>2</sup> Prior research has found that a firm's choice of incorporation is endogenously related to its capital structure decisions. Using a sample of Delaware firms allows us to control for this endogeneity and provides us with the largest sample of firms incorporated in a single state known for its least restrictive requirements to determine the impairment of capital. Under Section 170 of the Delaware General Corporation Law, a Delaware firm may make shareholder distributions out of surplus, which is defined as the excess of net assets over capital (which is typically the par value of shares issued and could be as low as zero). If a firm does not have a surplus, then it may pay dividends out of net profits from the current or prior fiscal year.

positively related to a firm's repurchase activities, consistent with prior repurchase activity increasing the likelihood of future repurchase activity. Interestingly, we find differing relationships between the firm's choice of accounting method and its repurchase likelihood, both across time and across firm risk levels.

Although idiosyncratic risk decreases the likelihood of a share repurchase in general, when two firms face similar idiosyncratic risk levels, we find the treasury firm is more likely to make share repurchases.<sup>3</sup> Thus, researchers and practitioners should control for the systematic differences between the two groups of firms when examining capital payout policies involving share repurchases.

This paper contributes to our understanding of the accounting choice between the treasury and retirement methods for share repurchases. Since this choice is not available to all firms, it is useful to understand the determinants of the decisions of the firms legally permitted to make this choice. It is useful to understand whether the accounting choice is merely cosmetic or whether management uses the discretion provided by GAAP to communicate the firm's motivation for the share repurchase transactions. Specifically, does management's choice of accounting method reflect the underlying motivation for the firm's share repurchases or the intentions for the repurchased shares? This understanding is important given an increasing number of states that do not permit the treasury method and hence, do not provide firms the discretion to communicate information of the firm's intention for the repurchased shares. Since we find systematic differences between firms electing to use the treasury method and firms that retire repurchased shares, a failure to appreciate these systematic differences could influence our understanding of corporate payout decisions.

The remainder of this paper proceeds as follows. The next section discusses the evolution of legal and accounting thought about the constructs of firm capital and reviews the academic research addressing treasury stock and its implications. Section 3 provides the framework for our research questions while Section 4 describes our sample selection and empirical findings. We provide concluding remarks in Section 5.

## 2. Institutional background and prior research

### 2.1. Legal views on treasury stock and capital sufficiency for shareholder distributions

Traditional legal regimes distinguished among the components of legal capital – par (or stated) value, capital surplus, and earned surplus (or retained earnings) – as a means to protect creditors from wealth expropriation by managers and shareholders. Corporate law prohibited dividend distributions out of the stated capital or capital surplus accounts, allowing the payment of dividends only out of unrestricted and unreserved earned surplus. However, the extent to which these provisions actually protected creditors is questionable. Further, firms found ways to circumvent the rules and manipulate allocations among the components of capital (Scriggins, 2011).

Historically, accounting standard setters viewed financial reporting as providing information about a firm's legal capital and advocated that the shareholders' equity section of the balance sheet detail the legal investments in a corporation – the specific distinctions among legal capital, capital surplus and “undivided profits” – rather than attempt to reflect the firm's net worth or changes in firm market value.<sup>4</sup>

<sup>3</sup> We use “treasury method” and “treasury firms” to denote firms recording reacquired shares into a treasury stock contra-equity account. The shares are still considered issued but not outstanding. A small number of companies record reacquired shares into the treasury stock account at par value. The “retirement method” and “retirement firms” or “retire firms” denote firms that immediately reduce the company's shares issued and reduce the common stock accounts (contributed capital, additional paid in capital, and retained earnings) for the market cost of the shares acquired.

<sup>4</sup> See Accounting Research Bulletin 12 issued by the Committee on Accounting Procedure of the American Institute of Accountants issued September 1941.

However, the increasing complexity of financial transactions and the accounting used to record them, such as purchase and pooling accounting, combined with improvements to creditor contracting, influenced an evolution in legal theory for the concept of shareholder capital (Scriggins, 2011). As a result, most states now restrict shareholder distributions in terms of balance sheet solvency (with little distinction between earned and capital surplus) and economic solvency criteria, with no reference to accounting retained earnings. Additionally, the law does not require firms to use GAAP measures to value assets and liabilities, which provides firms flexibility when evaluating legal solvency. Thus, firms reporting negative retained earnings or negative book value can still legally distribute funds to investors if the firm can meet the capital sufficiency requirements in the legal sense.<sup>5</sup> Delaware remains one of the least restrictive states in this regard and only requires that incorporated firms retain a surplus, defined simply as assets less liabilities and stated capital, and allows non-GAAP methods to determine asset and liability values.

Evolution of legal thought on shareholders' equity influenced changing conceptualities of treasury stock as well. The traditional legal view considered the reacquisition of shares into the treasury stock account as a temporary diversion of "surplus" which would either be restored through reissuance or made permanent through retirement at some undetermined point in the future. Firms faced no time limits determining the final disposition of the treasury shares. This treatment of treasury shares created a subset of issued shares that did not have similar rights as other shares. The revisions to the Model Business Corporation Act (MBCA) in 1980 and 1984<sup>6</sup> simplified and redefined the components of legal equity capital in terms of capital surplus and earned surplus with no reference to par value; further, the concept of treasury stock does not exist in the MBCA. States that have adopted the MBCA, or implemented corporate laws similar to the MBCA, require firms to treat repurchased shares as authorized but unissued shares; hence, these shares are legally and constructively retired.

Roberts, Samson, and Dugan (1990) discuss the changing legal philosophies regarding the components of capital and reflect on how the legal requirements no longer align with the traditional balance sheet presentation of paid-in capital and retained earnings, contrary to what practitioners, financial statement users, or researchers may believe. Current textbooks still purport that retained earnings represents "earned capital," which is defined as consisting of "all undistributed income that remains in the company" (Kieso, Weygandt, & Warfield, 2013, 824). Textbook authors focus on the treasury stock method and often relegate discussions of the retirement method to the textbook footnotes. In reality, the number of states prohibiting treasury stock is significant and includes California, Oregon, Washington, Georgia, Massachusetts and Maryland; in fact, 37% of annual share repurchases made between 2000 and 2011 was undertaken by firms without a treasury stock account.<sup>7</sup>

## 2.2. Accounting for share repurchases and treasury stock

Like stock splits, accounting standards allow managers a choice among methods to record share repurchases, although the choice should reflect management's intent for the use of the repurchased

shares. As per ASC Topic 505.30 *Treasury Stock*, firms hold repurchased shares at cost in the treasury stock account and present this account on the balance sheet as a reduction to stockholders' equity. Management's use of a treasury stock account implies an intent to reissue the shares at some yet undetermined point in time (ASC 505-30-30-6), and the shares are shown as an "unallocated reduction of capital and surplus" (Rankin, 1940, 75) until the firm decides its purpose for the shares. Legally, these shares are considered issued but no longer outstanding, are not included in a firm's earnings per share calculation, and do not have dividend or voting rights. However, if these shares are formally or constructively retired, the firm allocates the cost of the shares repurchased among the components of stockholders' equity, including the capital accounts and retained earnings (reductions only) as per ASC 505-30-30-8, with some flexibility afforded to management as to how to perform the allocation.<sup>8</sup>

State corporate law also affects a company's accounting for repurchased shares. As discussed previously, states that follow the MBCA view reacquired shares as retired—authorized but no longer issued. Other states, including Delaware, allow firms to elect to retain repurchased stock as treasury, which they can use for corporate purposes (employee stock redemptions, mergers, pension plan contributions, etc.). The varying legal treatment of repurchased shares and capital sufficiency requirements for shareholder distributions affect a firm's financial flexibility and could influence shareholder distributions to vary by state.

## 2.3. Limitations on the reissuance of treasury shares

The accounting choice to identify reacquired shares as treasury shares has additional economic implications. While Section 312.03 of the NYSE's Listed Company Manual requires firms to obtain shareholder approval before issuing shares in certain conditions or in significantly large amounts (New York Stock Exchange, 2013),<sup>9</sup> a *treasury share exemption* existed until 2006, which meant that treasury share transactions did not necessarily require shareholder approval. Since treasury shares remained "issued" shares, according to the NYSE, by definition they remained "listed"; thus, when a firm sold treasury stock, it technically did not list a new share, so the shareholder approval requirements of Section 312.03 appeared not to apply.<sup>10</sup> In 2006, the NYSE asserted that the treasury share exemption allowed companies to build reserves of capital that did not require shareholder approval for reissuance, and such an issuance ran the risk of significantly diluting the ownership value of existing shareholders. Recognizing this risk, the NYSE amended Section 312.03 to eliminate the treasury stock exemption and subject reissues of treasury stock to the same shareholder approval mechanisms as newly listed shares.<sup>11</sup> Apart from this exemption, the reissue of treasury shares is subject to the same SEC registration requirements (Habbart, Nolen, Cohen, & Goldfeld, 2014) and shareholder approval mechanisms as newly issued shares, essentially making the two types of shares fungible.<sup>12</sup>

<sup>5</sup> For example, in 2009, Boeing increased its quarterly cash dividends per share, despite reporting negative shareholders' equity of over \$1.1 billion and liabilities in excess of assets at the end of 2008. Boeing is incorporated in Delaware.

<sup>6</sup> Rev. Model Business Corporation Act (1984), prepared by the American Law Institute of the American Bar Association. The MBCA has been revised, with the most recent revision in 2011; however, the main impact on the components of shareholders' equity came with the 1980 and 1984 revisions of the Act, which have been slowly adopted by individual states over time.

<sup>7</sup> Between 2001 and 2011, 19,191 observations, outside of SIC codes 6000–6999 and 4900–4999 with market prices available on Compustat, reported cash outflows for the purchase of common stock in their statement of cash flows (PRSTKC). Of these observations, 7151 report zero balances in their treasury stock accounts (TSTK) leading to the inference that they use the retirement method for repurchases.

<sup>8</sup> For example, in the Summary of Significant Accounting Policies of its 2013 annual report, Lowes Companies, Inc. reports: "Shares purchased under the repurchase program are retired and returned to authorized and unissued status. Any excess of cost over par value is charged to additional paid-in capital to the extent that a balance is present. Once additional paid-in capital is fully depleted, remaining excess of cost over par value is charged to retained earnings." Lowes is incorporated in North Carolina where the treasury method is prohibited.

<sup>9</sup> These conditions include issuing 1% or more of currently outstanding shares to an insider or 5% or more of currently outstanding shares to a 5% or greater shareholder. Additionally, any issue of more than 20% of outstanding shares requires shareholder approval.

<sup>10</sup> This exemption was not valid for issuances of treasury shares for stock compensation programs, as a separate rule change effected by the NYSE in 2003 required shareholder approval for employee equity compensation programs no matter the source of the issued shares.

<sup>11</sup> See Securities Exchange Act Release No. 54579 (October 5, 2006), 71 FR 60786.

<sup>12</sup> Treasury stock is included in the SEC's definition of "security" as per the Securities Exchange Act of 1934 Sec. 3(a) (10), accessed at <https://www.sec.gov/about/laws/sea34.pdf> on March 17, 2016.



## 2.4. Existing research on the accounting for share repurchases

While share repurchase accounting might seem to involve only a cosmetic change to the equity section of the balance sheet with no income or cash flow consequences, there is an empirical question as to whether there are real economic consequences to holding treasury stock. Furthermore, there is a certain degree of opacity to share repurchase information, particularly before disclosure revisions to Rule 10b-18 took effect in late 2003.<sup>13</sup> While firms using the treasury method indicate the number and acquisition cost of the cache of treasury shares on the balance sheet each period, evaluating a firm's use of capital for share repurchases of retirement firms is more challenging. Managers can take advantage of the opacity of share repurchase information to execute economically inefficient repurchase transactions.

In contrast to the extensive research examining stock splits and stock dividends and management's motivation to select or avoid the accounting method that reduces retained earnings,<sup>14</sup> few studies examine whether the method a firm uses to record share repurchases conveys information to the market regarding a firm's future plans to undertake such corporate activities as stock compensation programs and asset acquisitions. Recent work by *Jenkins and Ovtchinnikov (2012)* finds that the market prices a firm's treasury holdings as if it anticipates future equity-financed transactions, thus supporting an economic consequence to reporting a treasury stock balance. Additionally, *Jenkins and Wang (2015)* hypothesize that the market perceives repurchased shares held in treasury differently than shares retired because of the information uncertainty regarding the firm's future use of the shares. Using a sample of U.S. firms extending from 1970 until 2012, the authors find that compared to retirement firms, treasury firms experience a higher cost of capital and a lower earnings response coefficient.

Research examining share repurchase accounting regime changes in other countries appears to indicate that firms value the option to hold shares in treasury. *Teng and Hachiya (2011)* examine the effects of a 2001 regulatory change in Japan that, for the first time, permitted Japanese firms to hold shares in treasury for an unlimited duration and for purposes beyond employee stock programs. The authors find that share repurchase program announcements of Japanese firms doubled in the period after deregulation.

While prior research examines how the market perceives firm holdings of treasury stock, no prior work, to our knowledge, examines whether firms that record repurchased shares as treasury stock differ systematically along certain economic and firm dimensions from firms that retire repurchased shares. Our paper adds to this emerging area of empirical research by seeking to understand the determinants of the accounting choice to record share repurchases.

## 3. Hypothesis development

### 3.1. Motivation for accounting choice

The accounting literature describes three main views regarding the motivations of management to make discretionary accounting choices: contracting, information efficiency, and opportunistic motivations

<sup>13</sup> See Securities Exchange Act Release No. 48766 (November 10, 2003), 68 FR 64952 (November 17, 2003). In periods prior to the December 15, 2003 effective date of the amendments to Safe Harbor 10b-18, investors found it quite difficult to unravel the timing, shares, and amounts of the trades that comprised the firm's annual share repurchase program. This difficulty was a significant motivation for the SEC's new disclosure requirements under Rule 10b-18. Under current rules, while share repurchase transactions are transparent and monthly transactions are reported quarterly, after the initial reporting, the history and ultimate realization of the transactions are more difficult to determine.

<sup>14</sup> Firms may record a stock split as a memo entry or a large stock dividend with a corresponding reduction in retained earnings. See *Grinblatt, Masulis, and Titman (1984)*, *Lakonishok and Lev (1987)* and *Rankine and Stice (1997)*, for example, for a discussion of the motivation and consequences of management electing between these accounting methods.

(*Fields, Lys, & Vincent, 2001*). Since few debt contracts are tied to retained earnings and the accounting choice to record share repurchases does not impact income or cash flows, managers most likely do not consider contracting when deciding between the retirement and treasury methods to record share repurchases.<sup>15</sup>

From an informational perspective, managers ideally will choose the accounting method to record share repurchases that best depicts management's intended use for the shares. Thus, if management elects the treasury method, management conveys to investors its intent to engage in future equity transactions such as stock compensation redemptions or future acquisitions. Alternatively, if management views the share repurchase as an efficient means to return capital to investors (*Dittmar, 2000; Jensen, 1986*) or to make efficient leverage adjustments (*Bagwell & Shoven, 1988; Opler & Titman, 1996*), the use of the retirement method would imply that the constructive retirement of these shares is an intended and permanent reduction to the firm's stockholders' equity.

Prior research also demonstrates that firms announce share repurchase programs to signal their stock is undervalued (*Dittmar, 2000; Ikenberry, Lakonishok, & Vermaelen, 1995; Stephens & Weisbach, 1998*). Under this financial motivation, management may prefer to clearly convey that repurchase activity is occurring; the treasury method would provide more transparent details of the firm's repurchase program activities used to signal undervaluation. In summary, the informational perspective of the accounting choice literature would support management choosing the accounting method that most efficiently represents the underlying economic and financial motivations for the firm's share repurchasing activities.

Alternative theories of the motivations for a firm's share repurchase activities align with more opportunistic descriptions of management's accounting choices. Prior research on share repurchases provides evidence that firms engage in share repurchases to manage earnings per share (EPS) or meet analyst forecasts (*Bens, Nagar, Skinner, & Wong, 2003; Brav, Graham, Harvey, & Michaely, 2005; Hribar, Jenkins, & Johnson, 2006*). Firms' opportunistically motivated share repurchase transactions are not always economically efficient transactions nor do they always result in improvements to EPS. Recognizing that the cost of a firm's repurchasing activities includes forgone investment opportunities or interest costs for borrowed funds, *Hribar et al. (2006)* demonstrate that share repurchases successfully increase a firm's EPS when repurchase transactions occur at an earnings to price ratio (EP ratio) exceeding the firm's required after-tax return on the forgone investment or costs of the borrowed funds. Given the transparency differences between the two accounting methods, a firm may opportunistically choose the retirement method to obfuscate the true economic impact or motivation for its repurchase transactions. The firm's ability to successfully cloak the effectiveness of its share repurchase transactions decreased considerably after December 15, 2003, when the SEC required detailed disclosures of the number and price of shares reacquired.

Motivated by the discussion above, our first research question examines the determinants of the choice of the accounting method used to record share repurchases:

*RQ1: Are the firm characteristics associated with a firm's choice to use the treasury (retirement) method to record share repurchases consistent with the economic motivation of the share repurchase program to provide a temporary (permanent) reduction in shareholders' equity?*

We expect underlying economic differences between treasury and retirement firms. If treasury firms use repurchase transactions to

<sup>15</sup> Analysts and researchers often use metrics calculated from a firm's retained earnings to proxy for a firm's lifecycle (retained earnings to total capital) and to assess a firm's bankruptcy risk (Altman's Z score). Such measures assume that a firm's retained earnings proxies for the firm's undistributed profits. However, we know of no systematic evidence that indicates that a firm's accounting choice is driven by a contracting motivation to manage these metrics.

only temporarily reduce capital, we expect *Treasury* firms to have higher growth prospects or opportunities to use the treasury shares as currency in future corporate events, higher levels of employee stock compensation programs, or greater need for financing flexibility (e.g., volatile cash flows, lower cash balances).

If systematic differences exist between firms using the treasury method and the retirement method, then the propensity for a firm to make future share repurchases may also vary by the accounting method management uses to communicate repurchase transactions. Therefore, our second research question examines the relationship between the accounting method used to record share repurchases and the firm's propensity to engage in future share repurchase transactions:

RQ2: *Is the accounting method used to record share repurchases associated with the firm's propensity to engage in future share repurchases?*

We are unaware of any economic explanation that leads us to anticipate whether a *Retire* firm would repurchase with more frequency than a *Treasury* firm or vice versa; thus, we view the tests of RQ2 as primarily descriptive in nature. However, given the change in the information regime over our sample period, we do predict that if managers use the retirement method to obfuscate the amount spent on share repurchase transactions and the timing of these transactions, then we expect *Retire* firms to make share repurchases when the firm's stock trades at relatively higher prices and when the likelihood of achieving an accretive impact on EPS is lower. After the disclosure regime change in 2004, we expect this likelihood to decline.

#### 4. Data, methodology and empirical results

##### 4.1. Sample selection and variable definitions

The choice of accounting method to record share repurchases is only available to firms incorporated in states recognizing treasury stock. To avoid an endogeneity concern related to the firm's choice to incorporate in a specific state, the firm's specific capital structure, and the legal differences that impact this accounting choice, for most of our study, we include only Delaware incorporated firms within our sample period between 1992 and 2011. The advantages to this sample limitation is that Delaware is the most frequent state of incorporation,<sup>16</sup> and Delaware maintains some of the least restrictive requirements defining "impaired" capital (see Footnote 2), allowing firms significant financial flexibility to engage in share repurchase transactions. Further, Delaware corporate law related to corporate payout policies remains constant over the sample period. We recognize that conclusions drawn from a sample of Delaware firms may not generalize to firms incorporated in other states.

For our main tests, we draw our sample from Compustat, eliminating firms in SIC codes 6000–6999 and 4900–4999 to exclude financial firms and utilities whose share repurchase and dividend activities face increased regulation. We also eliminate firms not trading on the NYSE, NASDAQ or AMEX exchanges or that do not have data available for current and lagged variables required in our models. All variables are defined as in prior studies of share repurchases (e.g., DeAngelo, DeAngelo, & Stulz, 2006; Fama & French, 2001) and detailed in Appendix A. We further require a firm have information available on CRSP to calculate a contemporaneous excess return ( $Return_t$ ). We calculate, but do not require excess return in the past ( $t - 1$ ) and future year ( $t + 1$ ) as well as firm idiosyncratic risk at  $t - 1$  (*Idio risk*). Further, to limit the impact of outlying observations, we eliminate firms with less than \$10 million of book assets and winsorize all continuous variables by year to the 1st and 99th percentiles.

Since the state incorporation code reported in Compustat (INCRP) reflects only a firm's current state of incorporation, we use incorporation information taken from the 10-K, 10-Q, and 8-K filings in the WRDS SEC Analytics Suite; however, the SEC information is only available for filings made after 1992, which limits our sample period. To further ensure the accuracy of our incorporation identification and resolve inconsistencies, we manually verified the state of incorporation by examining the annual SEC filings of the 492 firms either identified by Compustat as incorporated in Delaware but not reported as Delaware firms in the SEC Analytics Suite, or vice versa. This process increased our sample by 611 firm-year observations.

Next, we identify a firm as repurchasing in a given year (*RP Year*) when the cash outflow for the purchase of common stock (PRSTKC) less changes in preferred stock is more than 0.5% of prior year market capitalization.<sup>17</sup> This minimum threshold increases the likelihood that the repurchase observations we identify include firms where management makes open market or privately negotiated repurchase transactions and not transactions exclusively related to employee stock compensation redemption activities, the timing of which management cannot control. Finally, we eliminate 115 observations where amount spent on share repurchases to prior year market value ( $\%RP$ ) exceeds 25% of prior year market capitalization. These transactions represent significant changes to firm structure and do not reflect repurchase transactions related to firm capital payout policies.

To determine our repurchasing firm sample (*RP Firm*), we use a process consistent with Grinstein and Michaely (2005) and Jiang, Kim, Lie, and Yang (2013). We do not require our repurchasing firms to make a repurchase every year; thus, we identify an *RP Firm* as having a repurchase transaction in either the current year or at least one of the prior two fiscal years. This process yields 3599 firms comprising 25,441 annual observations meeting our minimum data requirements. Included in these observations are 11,400 *RP Firm* observations of 2012 firms. The repurchasing activity of the sample represents significant economic activity. The firms collectively repurchase, on average (at the median), \$88.0 billion (\$62.2 billion) each year between 1992 and 2011, with nearly \$260 billion repurchased in 2007 alone.

Identifying firms using the retirement method from Compustat data is challenging because Compustat does not adequately capture or identify reductions in retained earnings resulting from the use of the retirement method.<sup>18</sup> Since the retirement method leaves no historical trace on the balance sheet, it is difficult to differentiate between never-repurchasing firms and retiring firms.<sup>19</sup> We identify a *Retire* firm as a repurchasing firm with a zero or unchanged treasury stock balance and a *Treasury* firm as any repurchasing firm with a changing (either up or down) treasury stock balance.<sup>20</sup>

<sup>17</sup> This is the most accurate proxy recommended by Bany, Dyl, and Kahle (2008) to estimate a firm's common stock repurchases from data available in CRSP or Compustat.

<sup>18</sup> Compustat code SEQO may capture the retained earnings impact of formal retirements of treasury stock, but the retained earnings impact of firms regularly implementing the retirement method is not included in this data item.

<sup>19</sup> Prior research (e.g., Fama & French, 2001) assumes Compustat footnote code (TSTKC\_FN) identifies retirement firms; however, this footnote often identifies a firm formally retiring shares previously held in the treasury stock account, not firms regularly implementing the retirement method. When examining the 19,191 repurchasing observations detailed in Footnote 7 above, we find only 394 annual observations denoted by a TR footnote code (TSTKC\_FN), compared to the 7151 assumed *Retire* firm observations. Between 2001 and 2011, only 816 observations have a TR footnote code, a far lower occurrence than the expected level of share retirements, given the number of repurchasing firms incorporated in states that do not allow treasury stock accounts.

<sup>20</sup> We acknowledge that this identification procedure is not 100% effective. Some firms hold balances in their treasury accounts but use the retirement method for newly acquired shares – hence the requirement for *changes* in the treasury account. Other firms may utilize both the treasury stock and retirement methods in the same year, usually to differentiate between shares purchased related to employee compensation programs and shares repurchased for ordinary corporate uses. However, since we do not believe our selection process results in systematic errors, any misidentification is likely to create noise and weaken our reported results.

<sup>16</sup> As per <http://corplaw.delaware.gov>, over one million business entities and more than 65% of Fortune 500 companies are currently incorporated in Delaware.

## 4.2. Descriptive statistics

Table 1 compares the sample firms across firm characteristics used in prior capital market studies examining share repurchases. The left side of Panel A compares the repurchasing and non-repurchasing Delaware firms to ensure that our sample is consistent with prior studies. In general, the median repurchasing firm is larger (*Size*), generates significantly higher cash flows (*CF*), and experiences lower asset growth (*AGR*) and market to book ratios (*MB*). We find repurchasing firms pay dividends more frequently (43.6%) compared to non-repurchasing firms (20.8%).

Our main area of interest is the distinction between *Retire* and *Treasury* firms. The right side of Table 1 Panel A separately characterizes the *Treasury* and *Retire* observations. *Treasury* firms are significantly larger, more highly leveraged (*Lev*), more likely make dividend payments (*Divpayer*) and hold lower cash balances (*Cash*), similar to the differences noted in Jenkins and Wang (2015). The median *Treasury* firm makes significantly larger annual repurchases (*%RP*) than *Retire* firms. Further, we find the *Retire* firms report significantly higher asset growth rates (*AGR*), market to book ratios (*MB*) and idiosyncratic risk (*Idio Risk*), all characteristics consistent with *Retire* firms more likely in the growth rather than maturity stage of their life cycles, particularly

**Table 1**  
Sample description.

Panel A: Descriptive comparisons of 25,441 annual observations of 3599 Delaware incorporated firms												
Variable	Full sample			Repurchasing firms			Repurchasing firms			Retirement method		
	Non-repurchasing firms			Repurchasing firms			Treasury method			Retirement method		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Size	14,041	0.319	0.250	11,400	0.444***	0.400***	8589	0.453	0.400	2811	0.416***	0.350***
RP Year	14,041	0.000		11,400	0.683***		8589	0.701		2811	0.628***	
Lev	14,041	0.198	0.147	11,400	0.205***	0.183***	8589	0.212	0.195	2811	0.185***	0.137***
MB	14,041	2.440	0.171	11,400	1.960***	1.550***	8589	1.892	1.524	2811	2.170***	1.653***
ROA	14,041	-0.008	0.036	11,400	0.056***	0.060***	8589	0.058	0.060	2811	0.053*	0.061
AGR	14,041	0.271	0.112	11,400	0.134***	0.063***	8589	0.122	0.060	2811	0.171***	0.077***
% RP	14,041	0.000	0.000	11,400	0.028***	0.015***	8589	0.028	0.016	2811	0.027	0.012***
Cash	14,041	0.240	0.130	11,400	0.166***	0.092***	8589	0.152	0.082	2811	0.208***	0.133***
CF	14,041	0.043	0.084	11,400	0.105***	0.102***	8589	0.106	0.102	2811	0.101	0.104
Antidilute	14,041	0.022	0.000	11,400	0.026***	0.011***	8589	0.026	0.011	2811	0.026	0.009***
E/P Ratio	13,397	-0.060	0.025	11,341	0.009***	0.046***	8548	0.012	0.047	2793	-0.001*	0.042***
Return <sub>t</sub>	14,041	0.157	-0.003	11,404	0.093***	0.003	8589	0.082	0.001	2811	0.129***	0.008*
Divpayer	14,041	0.208		11,404	0.436***		8589	0.459		2811	0.365***	
Hitech	14,041	0.322		11,404	0.235***		8589	0.206		2811	0.324***	
Idio Risk	11,970	0.034	0.032	8767	0.027***	0.024***	6534	0.026	0.023	2231	0.029***	0.026***
RE < 0	14,041	0.430		7057	0.196***		8589	0.173		2811	0.266***	

  

Panel B: Descriptive comparison of 11,400 annual repurchase firm observations of 2012 high and low technology firms												
Variable	"Low" technology firms			Retirement method			High technology firms			Retirement method		
	Treasury method			Retirement method			Treasury method			Retirement method		
	N	Mean	Median	N	Mean	Median	N	Mean	Median	N	Mean	Median
Size	6823	0.451	0.400	1901	0.399***	0.350***	1766	0.457	0.400	910	0.454	0.350
RP Year	6823	0.697		1901	0.602***		1766	0.715		910	0.682*	
Lev	6823	0.228	0.217	1901	0.217**	0.189***	1766	0.149	0.079	910	0.117***	0.012***
MB	6823	1.768	1.457	1901	1.882***	1.498***	1766	2.368	1.902	910	2.771***	2.145***
ROA	6823	0.061	0.061	1901	0.063	0.061	1766	0.044	0.058	910	0.031	0.059
AGR	6823	0.111	0.058	1901	0.171***	0.075***	1766	0.163	0.073	910	0.172	0.083
% RP	6823	0.028	0.016	1901	0.027**	0.010***	1766	0.030	0.016	910	0.030	0.017
Cash	6823	0.120	0.061	1901	0.139***	0.076***	1766	0.277	0.235	910	0.351***	0.329***
CF	6823	0.106	0.101	1901	0.111*	0.105**	1766	0.103	0.107	910	0.081***	0.100**
Antidilute	6823	0.026	0.011	1901	0.028	0.009*	1766	0.029	0.013	910	0.024***	0.009***
E/P Ratio	6788	0.021	0.052	1888	0.020	0.051**	1760	-0.021	0.030	905	-0.044	0.025**
Return <sub>t</sub>	6823	0.068	-0.001	1901	0.111***	0.007	1766	0.136	0.013	910	0.164	0.012
Divpayer	6823	0.515		1901	0.420***		1766	0.241		910	0.248	
Idio Risk	5091	0.025	0.023	1491	0.028***	0.025***	1443	0.030	0.026	740	0.030	0.027
RE < 0	6823	0.136		1901	0.183***		1766	0.318		910	0.442***	

Annual firm year observations (1992–2011) of the full sample ( $n = 25,441$ ) or repurchasing sample ( $n = 11,400$ ) of firms comprised of U.S. incorporated, publicly traded (NYSE, NASDAQ or AMEX), non-financial firms incorporated in Delaware with all required data. *Repurchasing* firms have made a share repurchase (in excess of 0.5% of prior year's market capitalization) during the current or previous two years as evidenced by a non-zero cash flow to acquire stock (PRSKC) less preferred stock redemptions. *Treasury* firms are repurchasing firms with a non-zero treasury stock (TSTKC) balance. *Retire* firms are repurchasing firms with a zero or unchanging treasury stock balance in a repurchase year. *Size* is measured as the firm's market capitalization as a percentile of the NYSE at  $t - 1$ ; *RP Year* is an indicator measured as 1 for any year where the firm's share repurchases exceed 0.5% of prior year market capitalization; *Lev* is the book value of debt (DLT) plus current portion of long-term debt (DLTT) divided by the book value of assets (AT) at  $t - 1$ . *MB* is the ratio of the market value of equity plus the book value of debt divided by the book value of assets measured at the end of the prior year ( $(AT - CEQ + MV) / AT$ ); *ROA* is measured as income before taxes (IB) divided by the book value of assets (AT) at the end of the prior year; *AGR* is the growth in the book value of assets (AT) from  $t - 1$  to  $t$ ; *%RP* is the cost of the repurchased shares divided by market value (MVE) at the end of the prior year; *Cash* is the ratio of cash and short-term investments (CHE) divided by the book value of assets, all measured as of the end of the prior year; *CF* is operating income before depreciation (OIBDP) less cash paid for taxes (TXPD), interest expense (XINT) and cash paid for preferred and common dividends (DV) divided by the book value of assets measured at the end of the prior year; *Antidilute* is measured as weighted average diluted shares (CSHFD) less the weighted average basic shares (CSHPRI) divided by the weighted average basic shares, measured as of the end of  $t - 1$ ; *E/P Ratio* is the earnings to price ratio measured as diluted EPS (EPSFX) divided by fiscal year closing price (PRCC\_F), measured at the end of  $t - 1$ ; *Return<sub>t</sub>* captures the return of the firm's stock in the contemporaneous year, cumulated over the 250 trading days prior to the respective period-end, less the value weighted CRSP index; *Divpayer* is an indicator variable measured as 1 in any firm year where a common dividend is paid and 0 otherwise; *Idio risk* is the firm's idiosyncratic risk measured as the standard deviation of residuals from a regression of its daily excess stock returns (raw returns less the risk-free rate) on the market factor (i.e., the value-weighted market return less the risk-free rate). *Hitech* firms are firms within the following three-digit SIC codes according to Department of Commerce definitions: 283, 357, 366, 367, 382, 384, and 737. \*, \*\*, \*\*\* indicate  $p$  values of less than the 0.10, 0.05 and 0.01 significance levels respectively of the results of two sample  $t$  tests (unequal variance) of the means and two tail Wilcoxon sum rank tests for the median between the non-repurchasing and repurchasing firms (Panel A) or the *Treasury* and *Retire* firms (Panels A and B).



when compared to *Treasury* firms.<sup>21</sup> These characteristics of *Retire* firms run counter to our prediction in Section 3, derived from the guidance in GAAP, that *Treasury* firms would exhibit higher growth prospects. We are unaware of any economic explanation for this finding but note this relationship is similar to the one found by Jenkins and Wang (2015).

We also compare the firms along dimensions included to evaluate the repurchase motivations and repurchase efficiencies through *Antidilute* and *EP Ratio*. *Antidilute* helps capture a firm's incentive to repurchase for antidilutive reasons, noted by Kahle (2002) as a repurchase motivation that grows more likely after 1990 with the proliferation of employee stock compensation. We construct our *Antidilute* variable similarly to Cuny, Martin, and Puthenpurackal (2009),<sup>22</sup> and we find the median *Treasury* firm has a slightly higher proportion of potentially dilutive securities. This finding appears consistent with the intent of GAAP to view treasury stock as temporary in nature, as firms repurchasing shares to offset the dilution of future employee stock redemption activities hold the treasury shares temporarily with the intent to redistribute the equity from selling shareholders to employees in a future period. We also compare the firms by their E/P ratio (*EP Ratio*) measured at the end of the prior year. We find that the median *Retire* firm has a significantly lower *EP Ratio* indicating that if repurchasing, these firms repurchase shares at higher PE multiples than *Treasury* firms. Given the higher PE ratios and the fact that *Retire* firms appear to have more growth opportunities available (as measured by *MB* and *AGR*), it seems less likely that *Retire* firms can make accretive share repurchases than *Treasury* firms.

Overall, while most of the distinguishing characteristics of the *Treasury (Retire)* firms appear consistent with the characteristics we would expect of firms making temporary (permanent) reductions in shareholders' equity, the findings of a significantly lower *EP Ratio* for *Retire* firms seems to imply that those firms most likely to make inefficient share repurchases use the more opaque method to report share repurchase transactions. To determine whether industry composition drives the results noted above, Panel B of Table 1 separately compares the repurchasing firms across technology intensity.<sup>23</sup>

Companies operating in technology-intensive industries, where discretionary outlays in research and development and the use of stock compensation are essential to remain competitive and retain employees, often differ from other firms in their asset tangibility, cash flow volatility, and earnings properties (DeAngelo, DeAngelo, & Skinner, 2004). Thus, we expect high technology firms (*Hitech*) to differ from low technology firms in payout propensities (Hoberg & Prabhala, 2009), cash generation and holdings, leverage, and the use of potentially dilutive securities.<sup>24</sup>

Panel B of Table 1 reports the characteristics of high and low technology firms separately. The significant distinctions between the *Retire* and *Treasury* firms for *Lev*, *Cash*, and *MB* noted above remain regardless of technology level; however, we also report evidence of systematic differences related to industry membership. *Hitech* firms more likely use the retirement method (34.0% versus 21.8% of low technology repurchasing observations). While we are aware of no economic theory to explain this split, we conjecture that high technology firms, with their balance sheets capturing higher expenses for unrecorded internally developed intangible assets, may have less concern with the perception of negative retained earnings that may result from the retirement method. The proportion of negative retained earnings observations is higher for *Retire* firms across both technology groups, but this finding is likely a mechanical result of the accounting method itself.

For low technology firms, *Treasury* and *Retire* exhibit distinguishing characteristics similar to the full repurchasing sample: Low technology *Treasury* firms tend to be large (*Size*) firms with lower growth (*AGR*) and lower idiosyncratic risk (*Idio Risk*) that reacquire a higher proportion of outstanding equity (*%RP*). However, *Hitech Treasury* and *Retire* firms do not differ significantly on any of these dimensions. Instead, *Hitech* firms appear to vary in holdings of potentially dilutive securities, cash flow generation and E/P ratio. *Hitech Treasury* firms appear to have more motivation to repurchase for antidilutive reasons and generate higher cash flows. The median *Hitech Retire* firm reports a significantly lower *EP Ratio* than the median *Treasury* firm, consistent with a firm more likely making potentially non-accretive repurchases preferring to use a more opaque reporting method. The distinction between high and low technology firms is an important determinant in later tests and analyses.

The Pearson and Spearman correlation coefficients among our variables reported in Table 2 confirm the descriptive findings noted above. We find a positive association between firm size and leverage and the use of the *Treasury* method. There is a significant association between the *Retire* method and repurchasing firms with higher *MB*, asset growth, and idiosyncratic risk, cash levels, negative retained earnings, and high technology industry membership. *Treasury* firms report a higher proportion of potentially dilutive securities and E/P ratios. We also note that *Antidilute* and *EP Ratio* are positively correlated with a firm making a share repurchase in any given year (*RP Year*) which is consistent with the findings in Kahle (2002) and Hribar et al. (2006).

#### 4.3. Determinants of the accounting method

To support the univariate findings discussed above, we next identify the economic determinants of the accounting method choice. We define *Method Choice* as an indicator variable of 1 for a *Treasury* firm and 0 for a *Retire* firm. In our first tests, we limit our repurchasing sample to firms switching between the accounting methods over our sample period.<sup>25</sup> We identify only 124 switching firms out of our full sample of 2012 Delaware repurchasing firms. For a portion of these tests, we include all observation years of a switching firm (after it first enters our sample) regardless of whether the firm repurchases again over the sample period ( $n = 1163$ ); additionally, we examine the subset of firm years within the three year repurchase window ( $n = 975$ ). Of the switching firm-year observations, we identify 164 changes in method (29 of the switching firms change methods more than once over our sample period). Firms more frequently switch to the *Treasury* method (59%). If we assume that a firm's motivation to repurchase shares can change over the firm's life cycle, the low number of switching firms (6.2%)

<sup>21</sup> To determine whether higher *AGR* noted for *Retire* firms is driven by organic growth or acquisition-related growth, we remove any observation where Compustat code ACQ METH indicates the firm engaged in an acquisition during the year. Of the remaining 6695 and 2168 *Treasury* and *Retire* observations, respectively, that remain, the mean and median *AGR* remains significantly lower for *Treasury* firms at the  $p < 0.01$  level.

<sup>22</sup> Cuny et al. (2009) calculate their antidilution variable by adding back the shares repurchased to the weighted average diluted shares outstanding and finding the percentage change in this share number from  $t - 1$  to  $t$ . For our firms, we only know the expenditure for shares repurchased; we would need to estimate the number of shares repurchased which requires assumptions of the share acquisition timing in order to unwind the repurchasing impact on the weighted average diluted shares. Instead, we calculate our *Antidilute* variable as the percentage increase of the weighted average diluted shares over the weighted average basic shares (CSHFD-CSHPRI)/CSHPRI at the end of the prior year to avoid any confounding impact of the current year repurchase activity. We believe our measure captures the relative importance of the in-the-money, unexercised stock compensation to the sample firm. While weighted average diluted shares also captures the dilutive potential of other common stock equivalents such as warrants, these potential dilutive securities also may induce the firm to repurchase shares to mitigate EPS dilution resulting from common stock issuances.

<sup>23</sup> We also examine differences between small and large *Treasury* and *Retire* firms, and we find that our descriptive statistics of the size subsamples yield results consistent with the findings described in Panel A of Table 1.

<sup>24</sup> We define high technology firms as firms in the following three-digit SIC codes according to Department of Commerce definitions: 283, 357, 366, 367, 382, 384, and 737.

<sup>25</sup> A firm is a switching firm if it uses more than one method over the sample period. A firm switching to the retirement method in year  $t$  reports a treasury stock balance (TSTKC) in a prior repurchasing year and a zero or unchanged treasury stock balance in repurchasing year  $t$ . A firm switching to the treasury method in year  $t$  reports a zero (or unchanged) amount in TSTKC in a prior repurchasing year and an increasing balance in TSTKC in repurchasing year  $t$ .

**Table 2**  
Correlations of repurchasing firm characteristics with repurchase method (*Method Choice*).

Method Choice	RP Year	Size	Lev	MB	ROA	AGR	Hitech	Divpayer	%RP	Cash	CF	Antidilute	E/P Ratio	Return <sub>t</sub>	Return <sub>t-1</sub>	Idio Risk	RE < 0
Method Choice	0.067***	0.051***	0.063***	-0.084***	0.018*	-0.057***	-0.120***	0.082***	0.013	-0.128***	0.015	-0.001	0.015	-0.036***	-0.021***	-0.071***	-0.101***
RP Year	0.067***	0.166***	-0.079**	0.060***	0.130***	-0.075***	0.025**	0.048***	0.540***	0.030***	0.099***	0.049***	0.065***	-0.100***	-0.047***	-0.140***	-0.066***
Size	0.050***	0.166***	0.132***	0.174***	0.168***	-0.017*	0.022**	0.399***	0.082***	-0.174***	0.155***	-0.042***	0.085***	-0.129***	0.042***	-0.468***	-0.240***
Lev	0.086***	-0.075***	0.183***	-0.191***	-0.124***	0.064***	-0.199***	0.095***	0.005	-0.460***	-0.067***	0.016*	-0.027***	-0.044***	-0.043***	-0.063***	0.060***
MB	-0.076***	0.095***	0.271***	-0.286***	0.154***	0.146***	0.212***	-0.037***	0.018**	0.341***	0.133***	0.030***	-0.001	0.294***	0.162***	0.043***	0.064***
ROA	-0.005	0.171***	0.199***	-0.213***	0.518***	0.046**	-0.078**	0.131***	0.098***	-0.053***	0.780***	0.102***	0.162***	0.069***	0.149***	-0.263***	-0.323***
AGR	-0.055***	-0.062***	0.025***	0.005	0.240***	0.419***	0.047***	-0.087***	-0.088***	0.041***	0.138***	0.078***	0.035***	0.142***	0.182***	0.064***	0.020**
Hitech	-0.120***	0.025***	0.019**	-0.243***	0.222***	-0.023**	0.036**	-0.214***	0.025***	0.405***	-0.043***	0.012	-0.057***	0.051***	0.036***	0.126***	0.229***
Divpayer	0.082***	0.048***	0.393***	0.146***	0.020**	0.135***	-0.073***	-0.214***	-0.015	-0.277***	-0.002	-0.112***	0.091***	-0.075***	-0.045***	-0.397***	-0.295***
RP%	0.049***	0.819***	0.151***	-0.045***	0.088***	0.177***	-0.128***	0.024**	0.021**	0.026***	0.076***	0.049***	0.039***	-0.002	-0.065***	-0.130***	-0.028***
Cash	-0.108***	0.038***	-0.137***	-0.581***	0.334***	0.110***	0.020**	0.381***	-0.253***	0.046***	-0.140***	0.051***	-0.062***	0.087***	0.057***	0.205***	0.234***
CF	-0.007	0.115***	0.163***	-0.088***	0.433***	0.737***	0.457***	0.001	-0.035**	0.122**	-0.012	0.115***	0.131***	0.065***	0.154***	-0.175***	-0.259***
Antidilute	0.028***	0.135***	0.114***	-0.028***	0.115***	0.239***	0.144***	0.008	-0.039**	0.139***	0.042***	0.217***	0.083***	-0.024**	0.129***	0.009	-0.028***
E/P Ratio	0.059***	0.087***	0.035***	0.112***	-0.181***	0.273***	0.086***	-0.257***	0.225***	0.117***	-0.226***	0.187***	0.273***	-0.230***	-0.048***	-0.217***	-0.178***
Return <sub>t+1</sub>	0.018*	0.003	-0.010	0.018*	-0.094***	-0.017*	-0.053**	-0.003	-0.009	0.006	-0.005	0.038***	0.017*	0.005	-0.034***	0.137***	0.038***
Return <sub>t</sub>	-0.018**	-0.093***	-0.072***	-0.044***	0.284***	0.188***	0.156***	0.024**	-0.009	-0.046***	0.067***	0.177***	-0.028***	0.007	-0.027***	0.169***	0.049***
Return <sub>t-1</sub>	-0.010	-0.012	0.131***	-0.041***	0.193***	0.250***	0.215***	0.008	0.024**	-0.029**	0.036**	0.224***	0.196***	0.025**	-0.019**	0.002	0.018*
Idio Risk	-0.079***	-0.151***	-0.528***	-0.141***	-0.116**	-0.225***	-0.018*	0.119**	-0.439***	-0.172***	0.180***	-0.104***	-0.083***	-0.214***	-0.036***	-0.121***	0.286***
RE < 0	-0.102***	-0.066***	-0.244***	-0.014	0.026**	-0.308***	-0.096***	0.229**	-0.295***	-0.063***	0.183***	-0.239***	-0.164***	-0.357***	-0.016*	-0.055***	0.289***

Sample includes the 11,400 annual observations of 2012 Delaware repurchasing firms, or firms making a share repurchase within the current or prior two years (in excess of 0.5% of prior year's capitalization). *Method Choice* is measured as 1 for a *Treasury* firm and 0 for a *Retire* firm. *RP Year* is measured as a 1 if the firm makes a share repurchase in the current year (in excess of 0.5% of prior year's capitalization). All other variables are measured as described in Table 1. Pearson correlation (Spearman correlation) coefficients are reported in the top (bottom) portion of the table.

\* Indicate p values of less than the 0.10 significance level (two tailed test).

\*\* Indicate p values of less than the 0.05 significance level (two tailed test).

\*\*\* Indicate p values of less than the 0.01 significance level (two tailed test).



within our sample is surprising. We infer that once chosen, the accounting method to record share repurchases is sticky.

Table 3 presents the results of the model of the accounting choice to use the *Treasury* method. Limiting the sample to switching firms allows us to use a conditional fixed effect model which, while sacrificing efficiency, allows each firm to serve as its own control to help identify the common firm characteristics associated with a firm's decision to change to the *Treasury* method. Models (1)–(3) use all observations available for the switching firms while Model (4) only uses observations within the three year window of a share repurchase.

Model (1) includes the variables we expect are associated with a change in accounting method. We include %RP and RE < 0 and the interaction between the two. We expect that as the frequency and intensity of a firm's repurchase transactions increase, a firm grows unwilling to continue to use the *Retire* method and risk reporting negative retained earnings.<sup>26</sup> However, if a firm already reports negative retained earnings, the intensity of share repurchase transactions should have less influence on the method selection. We also include an indicator variable, *FutureAcq* to identify firms engaging in an acquisition in the following year. If firms expect to use equity to complete future corporate transactions, they should prefer to use the *Treasury* method, which provides them currency for the merger and may also signal to investors the intent to make future equity-financed firm investments. We include *Antidilute* and *EP Ratio* to see whether a firm repurchases to offset the dilutive effect of convertible securities or employee stock compensation programs or whether a firm's increased likelihood of making non-accretive repurchase transactions influence any change in accounting for repurchase transactions. Additionally, in Model (2), we test whether increased disclosure regulations of share repurchase transactions (*Before2004*) and the curtailment of the treasury stock exemption (*Before2006NYSE*) for NYSE firms impacts a firm's switch to the *Treasury* method.

The results reported in Models (1) and (2) indicate that only the intensity of the repurchase transaction influences a firm's decision to switch accounting methods. The more significant a firm's repurchase transaction in any given year, the more likely the firm is to switch to the *Treasury* method. The models include an indicator variable for negative retained earnings (RE < 0) as well as an interaction between repurchase intensity and RE < 0; however, we do not find significance on these variables and thus, do not find support for the conjecture that firms switch to the treasury stock method to avoid reporting negative retained earnings.

In Model (3), we include other control variables that may impact a firm's accounting method choice. We include *Size* and *Lev* as [Holthausen and Leftwich \(1983\)](#) find that firm size and leverage are the only two significant variables explaining firm accounting choices. We include *AGR* to determine if a firm's growth impacts its accounting choice, given the descriptive differences noted in [Table 1](#) discussed above. We continue to find that only repurchase intensity (%RP) is significantly associated with a firm's decision to change to the *Treasury* method.

Finally, we reduce the sample to only firm-years within our three year "recently repurchasing" window as firms cannot switch accounting methods unless they make share repurchases. We report these results as Model (4). Not only does %RP remain positive and significant, but we also find a mild association between the future acquisition activities of a firm and a switch to the *Treasury* method, consistent with the use of a firm's treasury holdings as currency in future corporate transactions.<sup>27</sup>

<sup>26</sup> For example, P&G, incorporated in Ohio, changed its accounting method to record share repurchases in 2005 when it appears the continued use of the retirement method would cause the firm to report negative retained earnings. In its disclosure discussing the accounting change, P&G claimed the treasury method better represented the firm's intent for the repurchased shares. To date, many of these shares remain undistributed.

<sup>27</sup> In untabulated results we include the natural log of *Idio Risk* which reduces our sample by 235 observations. Firm specific risk does not appear to significantly impact a firm's move to the *Treasury* method.

**Table 3**  
Analysis of switching firms – accounting method regressed on firm characteristics.

	Prediction	Model (1)	Model (2)	Model (3)	Model (4)
RP %	(+)	9.051 (2.45)**	9.410 (2.60)***	8.472 (2.09)**	7.461 (2.03)**
RE < 0	(–)	–0.415 (–0.91)	–0.416 (–0.79)	–0.382 (–0.76)	–0.191 (–0.32)
RP% * RE < 0	?	–5.782 (–0.79)	–5.995 (–0.88)	–4.507 (–0.62)	–5.561 (–0.80)
FutureAcq	(+)	0.563 (1.52)	0.575 (1.46)	0.562 (1.38)	0.651 (1.75)*
Antidilute	(+)	–3.227 (–1.05)	–3.242 (–1.06)	–3.114 (–0.89)	–3.193 (–0.92)
E/P Ratio	(+)	0.314 (0.70)	0.301 (0.62)	0.235 (0.43)	0.348 (0.60)
Before 2006 NYSE	?		–0.420 (–0.51)		–0.457 (–0.60)
Before 2004	?		–1.477 (–1.10)		–1.662 (–1.04)
Size	?			0.464 (0.31)	0.668 (0.43)
Lev	(–)			–1.076 (–0.72)	–1.343 (–0.95)
AGR	(+)			–0.342 (–1.34)	–0.350 (–1.15)
Firm years		1163	1163	1163	975
Firms		124	124	124	124
Model significance ( $\chi^2$ )		***	***	***	***

Logit model where the *Method Choice* (*Treasury* = 1; *Retire* = 0) is regressed on firm characteristics. The sample includes 1163 annual observations of 124 Delaware incorporated firms identified as switching between the retirement and treasury methods at least once over the sample period. A firm is identified as a switching firm if more than one method is utilized over the sample period. A firm switching to the retirement method in year *t* reports a treasury stock balance (TSTKC) in a prior repurchasing year and a zero or unchanged treasury stock balance in repurchase year *t*. A firm switching to the treasury method in year *t* reports a zero (or unchanged) amount in TSTKC in a prior repurchasing year and an increasing balance in TSTKC in repurchasing year *t*. Full sample of 1163 observations includes all repurchasing and non-repurchasing years; when only frequently repurchasing observations (*Repurchasing* as defined in [Table 1](#)) are included, 975 observations of the 124 firms remain (Model 4). *Before 2006 NYSE* is an indicator variable of 1 if the observation of an NYSE-traded firm occurs before the treasury stock exemption is eliminated in 2006. *Before2004* is an indicator variable of 1 if the annual observation occurs before the December 2003 changes to the SEC's disclosure requirements for share repurchases and 0 otherwise. *FutureAcq* is an indicator variable of 1 if a firm executes a merger in *t + 1* where the target firm increased the sample firm's assets or revenues by 15% over the respective sales or assets reported in *t*. All other variables are defined as in [Table 1](#). *T* stats, reported in parenthesis, are calculated using bootstrapped standard errors (200 replications).

\* Indicate significance at the  $p < 0.10$  level (two tailed tests).

\*\* Indicate significance at the  $p < 0.05$  level (two tailed tests).

\*\*\* Indicate significance at the  $p < 0.01$  level (two tailed tests).

Overall, we find that among our switching firms, only the firm's repurchase intensity is related to the switch to the *Treasury* method.

Since few firms change method across our sample period, we examine each firm's initiating repurchase transaction to identify the firm characteristics associated with the initial choice of the *Treasury* method. We exclude firms we previously identify as switching firms and define a firm's initiating year as the first year it enters our repurchasing sample. Although we cannot distinguish between initiating firms repurchasing for the first time and long-time repurchasing firms newly incorporated in Delaware, using only one observation for each firm reduces the likelihood that repeated firm observations induce heteroscedastic standard errors. We run additional analyses on our full sample of repurchasing firms and draw similar conclusions.

Models (1) to (4) of [Table 4](#) provide the results of the logit models of the initiating sample over various time periods. All models include yearly indicator variables (not tabulated) and robust standard errors clustered by year. In Model (1), using the initiating observations from the 1992–2011 time period, we find that firms with lower MB ratios and firms traded on the NYSE more likely use the *Treasury* method.

**Table 4**  
A repurchasing firm's propensity to use the treasury stock method (*Method Choice*) to record share repurchases.

Sample period	Prediction	Initiating sample					Repurchasing Delaware firm observations	
		Model	Model	Model	Model	Model	Model	Model
		(1)	(2)	(3)	(3a)	(4)	(5)	(5a)
		1992–2011	1993–2011	1993–2003	2004–2011	1993–2011	1992–2011	1992–2011
		Model coefficients (t statistics in parenthesis)						
Intercept	?	2.489 (15.70)***	2.163 (12.49)***	0.042 (6.87)***	2.844 (6.67)***	2.338 (8.44)***	1.215 (10.25)***	1.259 (8.36)***
MB	(+)	-0.079 (-2.06)**	-0.076 (-1.87)**	-0.099 (-1.92)*	-0.049 (-0.54)	-0.082 (-1.96)**	-0.056 (-1.99)**	-0.057 (-1.98)*
Antidilute	(+)	0.910 (0.98)	1.108 (1.01)	-0.179 (0.13)	3.606 (1.64)*	1.210 (1.02)	-0.064 (-0.09)	-0.049 (-0.06)
FutureAcq	(+)	-0.374 (-1.92)*	-0.371 (-1.80)*	-0.533 (-1.88)*	-0.025 (-0.11)	0.091 (0.38)	0.061 (0.59)	0.274 (1.30)
FutureAcq * Before2004	(+)					-0.654 (-1.74)*		-0.336 (-1.37)
EP Ratio	?	0.036 (0.51)	0.038 (0.54)	0.427 (3.17)**	-0.219 (-1.87)*	-0.202 (-2.17)**	-0.014 (-0.27)	-0.180 (-1.49)
EP * Before2004	(+)					0.610 (3.02)***		0.435 (2.50)**
NYSE	(+)	0.315 (3.18)***	0.338 (2.92)***	0.449 (3.17)***	0.223 (0.92)	0.356 (3.02)***	0.571 (4.27)***	0.573 (4.28)***
Hitech	?	-0.294 (-2.44)**	-0.224 (-1.92)*	-0.116 (-0.74)	-0.331 (-1.72)*	-0.215 (-1.81)*	-0.220 (-1.72)*	-0.219 (-1.71)*
RE < 0	(-)	-0.184 (-1.03)	-0.226 (-1.22)	-0.096 (-0.27)	-0.168 (-0.67)	-0.226 (-1.21)	-0.330 (-2.91)***	-0.322 (-2.83)***
Before 2004	?	-1.182 (-9.29)***	-1.173 (-8.63)***			-1.361 (-5.59)***	-0.260 (-14.25)***	-0.329 (-3.44)***
Size	?	0.007 (0.03)	-0.080 (-0.32)	-0.096 (-0.27)	-0.306 (-1.03)	-0.133 (-0.54)	-0.170 (-0.81)	-0.172 (-0.81)
Lev	(-)	-0.375 (-1.23)	-0.389 (-1.15)	-0.318 (-0.60)	-0.518 (-1.19)	-0.417 (-1.20)	0.079 (0.27)	0.083 (0.28)
AGR	(+)	-0.145 (-0.93)	-0.149 (-0.97)	-0.213 (-1.22)	0.055 (0.31)	-0.167 (-1.14)	-0.244 (-2.91)**	-0.247 (-3.07)***
Cash	?	-0.848 (-2.29)**	-0.730 (-1.88)*	-0.073 (-0.28)	-1.864 (-2.17)**	-1.615 (-2.28)**	-0.481 (-1.57)	-0.731 (-1.93)*
Cash * Before2004	(+)					1.424 (2.15)**		0.473 (1.30)
Firm Years		1861	1593	1089	504	1593	11,341	11,341
Firms		1861	1593	1089	504	1593	2004	2004
Pseudo R <sup>2</sup>		0.052	0.053	0.052	0.066	0.062	0.038	0.040

Logit model predicting whether a repurchasing firm uses the treasury or retirement method to record share repurchases. *Initiating Sample* includes one observation for each Delaware repurchasing firm not identified previously as one of the 124 switching firms; the firm is represented in the earliest year (between 1992 and 2011) it enters our sample. *Repurchasing Delaware firm observations* include all Delaware repurchasing firms including those switching accounting methods over the sample period. The dependent variable (*Method Choice*) is measured as a 1 for a *Treasury* firm and 0 for a *Retire* firm. A *Treasury* firm is defined as a repurchasing firm with a non-zero treasury stock (TSTKC) balance and a *Retire* firm is identified as a repurchasing firm with a zero or unchanging treasury stock balance in a repurchase year. *NYSE* is an indicator variable of 1 for a firm trading on the NYSE and 0 otherwise. *FutureAcq* is an indicator variable of 1 if a firm makes an acquisition in  $t + 1$  where the target firm increases the sample firm's assets or revenues by 15% over the respective assets or revenues reported in  $t$ . All other variables are defined as in Table 1. All models include robust standard errors clustered by year, and models which include repeated firm observations have standard errors clustered by firms. All models include yearly indicator variables (results not tabulated). T stats are reported in parenthesis.

\* Indicate significance at the  $p < 0.10$  level (two tailed tests).

\*\* Indicate significance at the  $p < 0.05$  level (two tailed tests).

\*\*\* Indicate significance at the  $p < 0.01$  level (two tailed tests).

These characteristics seem inconsistent with firms with greater growth opportunities more likely to reissue treasury capital in future transactions. The *Retire* firms are more likely high technology firms and firms with higher cash levels. This appears consistent with a retirement method preference by firms repurchasing when operations yield excess cash flows, which seems consistent with a permanent reduction in capital. We find no discernible accounting method preference related to a firm's level of dilutive securities or E/P Ratio.

Since our sample begins in 1992 and we cannot specifically determine the year a 1992 observation initiates share repurchase activity in Delaware, we exclude 1992 annual observations in Model (2), and the results remain consistent with Model (1). In both models, we include a variable *Before2004* to identify any differences between the two SEC Rule 10b-18 disclosure regimes. There is a risk that *Before2004* captures economy-wide differences or the impact of other regulatory events occurring during the same time period which may also affect share

repurchase activities and the accounting method used to record them.<sup>28</sup> We find *Before2004* is negative and significant in both Models (1) and (2) indicating a shifting preference towards the *Treasury* method in the increased disclosure regime after 2004.

To fully assess the impact, if any, of the different disclosure regimes, Models (3) and (3a) separate the sample into the two disclosure regimes and indicate that the characteristics associated with the accounting choice differ remarkably across these two time periods. Prior to 2004, the *Retire* firm more likely engages in future merger transactions, which seems counter to the expectation that a *Treasury* firm more likely

<sup>28</sup> For example, in addition to the 2003 exchanges' requirement for shareholder approval of employee stock compensation programs, the American Jobs Creation Act of 2004 provided for a one-year dividend repatriation tax holiday, which firms could take in either 2004 or 2005. Also, in December 2004, FASB passed FAS 123R requiring the expensing of employee stock options.

has a future intent for the repurchased shares. Additionally, the negative coefficient on *MB* implies that a firm with greater growth opportunities or perhaps market overpricing more likely retires the repurchased shares, consistent with our conjecture that the higher the likelihood a firm makes an inefficient share repurchase transaction, the more likely the firm elects the more opaque accounting method. *Treasury* firms more likely trade on the NYSE, which is consistent with an increased ability to utilize the repurchased shares without additional shareholder approval.

After the change in disclosure regime (Model 3a), we note several interesting shifts in the characteristics of firms initiating a choice in accounting method. Trading on the NYSE no longer influences the choice for the *Treasury* method. Although the NYSE eliminated the treasury stock exemption in 2006, by 2004, firms were required to disclose to shareholders (and seek approval for) the source of the shares issued for stock compensation programs; thus, in this time period, the perceived benefits of treasury shares were mitigated somewhat from several different causes. Instead, a characteristic of firms most likely to opt for the *Treasury* method is the potential use of the repurchased shares to offset share dilution. Firms with higher cash balances exhibit a significantly higher likelihood to opt for the *Retire* method after the increased disclosure requirements, while in the pre-disclosure period, cash holdings do not appear to significantly influence a firm's accounting choice. We expect firms with higher cash balances to more likely engage in share repurchases to efficiently return capital to investors and avoid overinvestment problems, and it is consistent with this economic motivation to consider this type of repurchase as a permanent capital reduction. The negative and significant coefficient on *Cash* supports this scenario. Further, we also note that this latter time period is characterized by firms holding larger cash balances in general (Bates, Kahle, & Stultz, 2009), which could have increased the incidence of this economic motivation for repurchase transactions after 2004, adding to the statistical significance of this result. Finally, after 2004, we find that treasury and retire firms in Model (3a) are not distinguishable in terms of growth prospects as measured by their market to book ratios. We interpret this result to indicate that after firms were required to make more detailed disclosures, the impact of high growth firms' use of capital to repurchase shares grows more transparent to investors and makes the *Retire* method less likely used by firms obfuscating economically inefficient transactions.

The E/P ratio appears to have a changing impact across the two disclosure regimes as well. In the early period, *Treasury* firms report higher E/P ratios indicating that firms more likely to make efficient share repurchases opt for the more transparent accounting method. After the requirement for detailed share repurchase disclosures, firms with lower E/P ratios are more likely to adopt the *Treasury* method. This result is consistent with lower E/P firms preferring the lower disclosure *Retire* method to possibly obfuscate inefficient repurchase transactions prior to the changes to Rule 10b-18. After 2004, lower E/P firms have less incentive to select the *Retire* method as they must make quarterly disclosures summarizing repurchase transactions for each month in the quarter under both accounting methods. Model (4) combines both regimes into one model and confirms the results of the Models (3) and (3a) where the regimes are run separately.

Finally, we extend our model to the full set of Delaware repurchasing firms in Models (5) and (5a). The latter model includes an indicator variable to identify the increased disclosure reporting period after 2004. We discern few qualitative changes from the results reported previously if we allow firm observations to repeat over time. However,  $RE < 0$  is now negative and significant, which most likely results from the mechanical differences between the two methods. Negative retained earnings do not induce a firm to elect the *Retire* method, but as repurchasing activities continue, *Retire* firms more likely report negative retained earnings compared to *Treasury* firms.

Overall, the results in this section support the univariate results in Tables 1 and 2. A firm's choice between the *Retire* and *Treasury*

methods is not random but is related to a number of firm characteristics including E/P ratio, firm growth, cash holdings, and industry membership. The determinants of the *Treasury* method do not appear fully consistent with the firm characteristics that imply a higher likelihood of future equity-financed transactions. Instead, the *Retire* firms report higher growth rates, market expectations of growth, and more likely participate in future acquisitions. Our empirical analysis above also suggests that the choice of method is sticky as firms in our sample seldom switch methods over our sample period.

#### 4.4. The relation between accounting method and repurchase transactions

The sections above document the firm characteristics related to the selection of the *Treasury* method. Many firm characteristics that we document as related to this accounting choice also influence a firm's corporate financing activities, including share repurchases. If there exists an economic relationship between the accounting method used to record share repurchases and the firm's propensity to engage in share repurchase activities, then omitting the repurchase accounting method as a control variable may induce an omitted variables problem.

For this analysis, we use our full sample of Delaware firm observations with available information on idiosyncratic risk, prior period return, and E/P ratio. Table 5 reports the results of the logit model where we predict a firm's propensity to make share repurchase transactions using a model similar to one used by Fama and French (2001). To avoid an over-identification issue, we alter slightly our definition of *Treasury* and *Retire*. If a firm has not repurchased in the prior two years, it is now classified as a non-repurchasing ( $RP\ Firm = 0$ ) firm.<sup>29</sup>

Table 5, Models (1) and (2) examine the characteristics of Delaware firms making share repurchases. The relationship between our control variables and a firm's propensity to make share repurchases is consistent with prior research studies. In Model (3), we add indicator variables for *Treasury* and *Retire* firms and find that the inclusion of these variables eliminates the significance of *Divpayer* in the model. While research indicates that dividend paying firms do have an increased likelihood of also making share repurchases, it is likely the significance of *Divpayer* in Models (1) and (2) is subsumed by the inclusion of a firm's prior repurchasing activities which we include in Model (3) with *Retire* and *Treasury*.

Since we are more interested in identifying real economic differences related to the accounting choice, and given that Hoberg and Prabhala (2009) find that idiosyncratic risk explains much of the change to payout propensity over time, Model (4) includes interactions between the accounting choice identifiers (*Treasury* and *Retire*) and idiosyncratic risk. If *Idio Risk* is related to a firm's mispricing, significance on these interactions would indicate a relation among a firm's idiosyncratic risk, the informational properties of the accounting method used to present share repurchase information, and the firm's propensity to make share repurchases. We find both interactions negative and significant. The mean marginal effect on  $Treasury * Log(Idio\ risk)$  is  $-0.058$  ( $z = -3.04$ ) compared to the mean marginal interaction effect of  $Retire * Log(Idio\ risk)$  of  $-0.125$  ( $z = -4.29$ ).<sup>30</sup> We interpret this result to imply that at a given idiosyncratic risk level, on average, a *Retire* firm is less likely than a *Treasury* firm to engage in a repurchase transaction. More importantly, this result indicates that the accounting choice between the two methods is not merely cosmetic but correlated with firm characteristics that also influence the likelihood of a firm's share repurchase transactions.

<sup>29</sup> This alteration leaves us with 6907 *Treasury* method observations and 2245 *Retire* firm observations for the full sample, compared to the 11,400 frequently repurchasing firm year observations used in prior tests.

<sup>30</sup> Results not tabulated. We use the method recommend by Norton, Wang, and Ai (2004) to evaluate the mean marginal effect of the interactions of our logit models.

**Table 5**  
Logit models predicting share repurchase activities as a function of firm characteristics of Delaware Incorporated Firms.

D.V.	Prediction	Repurchase = 1 (Logit)						Marginal effect	
		(1)	(2)	(3)	(4)	(5a)	(5b)	Model	Model
Sample Period		1992–2011	1992–2011	1992–2011	1992–2011	1992–2003	2004–2011	(5a)	(5b)
Model coefficients (t statistics in parenthesis)									
Intercept	?	–5.678 (–14.15)***	–5.663 (–15.82)***	–4.898 (–14.34)***	–4.141 (–13.68)***	–4.002 (–9.52)***	–4.246 (–7.29)***		
Size	(+)	0.865 (6.11)***	0.861 (6.05)***	0.839 (6.32)***	0.809 (5.90)***	0.679 (4.55)***	1.013 (4.61)***	0.12	0.19
MB	(–)	–0.147 (–5.60)***	–0.142 (–5.32)***	–0.121 (–4.52)***	–0.123 (–4.62)***	–0.127 (–3.63)***	–0.107 (–2.37)**	–0.02	–0.02
Log (Idio Risk)	(–)	–1.086 (–10.92)***	–1.982 (–10.90)***	–0.760 (–8.49)***	–0.560 (–6.33)***	–0.562 (–4.91)***	–0.686 (–4.90)***	–0.09	–0.13
Cash	(+)	0.571 (3.97)***	0.564 (3.92)***	0.650 (5.89)***	0.621 (5.87)***	0.459 (3.31)***	0.777 (5.93)***	0.08	0.15
CF	(+)	2.070 (4.88)***	2.126 (5.38)***	1.528 (4.24)***	1.547 (4.48)***	1.086 (2.76)***	2.428 (5.74)***	0.18	0.45
Lev	(–)	–0.700 (–3.97)***	–0.710 (–3.94)***	–0.675 (–4.57)***	–0.675 (–4.58)***	–0.658 (–3.92)***	–0.772 (–3.07)***	–0.11	–0.14
AGR	(–)	–1.107 (–6.76)***	–1.129 (–6.61)***	–0.874 (–5.84)***	–0.884 (–5.90)***	–0.608 (–5.54)***	–1.617 (–7.63)***	–0.10	–0.30
ROA	(+)	1.687 (4.46)***	1.523 (3.43)***	1.498 (4.09)***	1.516 (4.39)***	1.152 (3.10)***	2.041 (3.73)***	0.19	0.38
Ret <sub>t-1</sub>	(–)	–0.190 (–5.56)***	–0.200 (–5.95)***	–0.177 (–4.12)***	–0.174 (–4.05)***	–0.222 (–3.84)***	–0.095 (–1.96)**	–0.04	–0.02
Divpayer	?	0.253 (3.10)***	0.260 (3.14)***	0.010 (0.14)					
NYSE	?	–0.167 (–2.35)**	–0.166 (–2.31)**	–0.146 (–2.49)**	–0.137 (–2.38)**	–0.087 (–1.05)	–0.179 (–2.60)***	–0.01	–0.03
FutureAcq	(–)		–0.129 (–2.41)**	–0.115 (–1.91)*	–0.124 (–1.91)*	–0.121 (–1.71)*	–0.124 (–1.01)	–0.02	–0.02
Antidilute	(+)		0.975 (2.10)**	0.853 (1.93)*	0.784 (1.89)*	0.116 (0.24)	2.027 (3.58)***	0.02	0.38
EP Ratio	(+)		0.146 (0.64)	0.105 (0.83)	0.099 (0.77)	0.214 (1.24)	–0.291 (–7.48)***	0.04	–0.05
EP * Treasury Firm	?					0.413 (2.20)**	0.538 (4.24)***	0.07	0.10
EP * Retire Firm	?					1.179 (1.44)	0.523 (1.39)	0.19	0.10
Treasury Firm	?			2.060 (29.95)***	0.846 (2.16)**	1.494 (3.11)***	0.776 (1.38)	0.25	0.14
Treasury * Log (Idio risk)	?				–0.332 (–3.11)***	–0.133 (–0.98)	–0.378 (–2.61)***	–0.02	–0.07
Retire Firm	?			1.719 (17.84)***	–0.907 (–1.82)*	–0.414 (–0.66)	–0.231 (–0.20)	0.07	–0.04
Retire * Log (Idio risk)	?				–0.717 (–5.45)***	–0.545 (–3.26)***	–0.582 (–2.31)**	–0.09	–0.11
Pseudo R <sup>2</sup>		0.137	0.140	0.256	0.258	0.228	0.304		
Firms		3473	3449	3449	3449	2759	1980		
Firm Years		20,380	20,205	20,205	20,205	12,302	7903		
Treasury firm years		5112	5090	5090	5090	2705	2379		
Retire firm years		1734	1728	1728	1728	926	796		
Model Fit		***	***	***	***	***	***		

Logit models predict the probability that a firm makes a share repurchase transaction in excess of 0.5% of prior year market value (models Repurchase year = 1). The sample includes all Delaware incorporated, publicly traded (NYSE, NASDAQ, or AMEX), nonfinancial firms with information available to be included in the model. *Treasury Firm* is an indicator variable measured as 1 for firms repurchasing in  $t-1$  or  $t-2$  and use the treasury method, and 0 otherwise. *Retire Firm* is an indicator variable measured as 1 for firms repurchasing shares in  $t-1$  or  $t-2$  using the retirement method, or 0 otherwise. All other variables are defined as in Table 1. All models include yearly indicator variables (results untabulated). T stats, reported in parenthesis, are calculated using robust standard errors clustered by firm and year.

\* Indicate significance at the  $p < 0.10$  level (two tailed tests).

\*\* Indicate significance at the  $p < 0.05$  level (two tailed tests).

\*\*\* Indicate significance at the  $p < 0.01$  level (two tailed tests).

To determine if the change in information regime impacts the relationship between a firm's characteristics and its propensity to make share repurchases, Models (5a) and (5b) split the sample into two periods around the changed disclosure requirements to SEC Rule 10b-18 in 2004. We report the marginal effects for the mean firm as well. Not only do the models include the interaction between each repurchase method and *Idio Risk*, but also, given the change in influence of the E/P ratio on the method choice across reporting regimes noted in Table 4, the models also include the interactions between *EP Ratio* and each accounting method.

We find that the negative relationship between *Idio Risk* and a firm's propensity to repurchase stock increases in the later disclosure regime. We interpret this finding to indicate that for a given risk level, firms are less likely to make share repurchases after the new disclosure requirements took effect. *Retire* firms continue to exhibit a stronger negative risk-repurchase relationship than *Treasury* firms, and the marginal impact of this risk-repurchase relationship is more strongly negative (i.e. more likely to reduce the incidence of a share repurchase transaction) after the new disclosures. This finding is consistent with firms facing higher idiosyncratic risk levels or potential mispricing likely are more



reluctant to make potentially inefficient repurchase transactions if they must detail these transactions to financial statement users.

In the post-disclosure regime, the negative significance on *EP Ratio* implies that, in general, a higher EP ratio reduces the likelihood that a firm makes a share repurchase, counter to our expectation that an economically efficient share repurchase more likely occurs at a lower price–earnings multiple. Examining the interaction variables between *EP Ratio* and our accounting choice identifiers and the marginal effects, we find that *Treasury* firms consistently repurchase at higher EP levels than *Retire* firms, and these EP levels appear even higher in the post-disclosure period. The lack of significance on the *Retire* interaction terms limits our ability to draw conclusions, but it appears that the EP ratio has limited influence on the likelihood that a *Retire* firm makes a share repurchase, but when a *Retire* firm does, all else equal, it will make a share repurchase at higher price–earnings multiples than a *Treasury* firm.

We also note that *Antidilute* is positive and significant only after 2004. In untabulated results, we find the impact of potentially dilutive securities is not notably different between *Treasury* and *Retire* firms. Thus, regardless of accounting method, executives holding significant levels of unredeemed stock compensation will benefit personally from share repurchase activities, and this motivation for share repurchases seems more pronounced after 2004.

## 5. Summary and conclusions

We examine the accounting choice between the treasury and retirement methods to record share repurchases. Although an increasing number of states mandate the retirement method, Delaware and many other states do not. Companies that have the choice between methods should follow GAAP and only maintain treasury shares if management intends to reissue the shares. However, we find that more mature, lower growth firms appear to hold significant stores of treasury shares on a more permanent basis than one would expect from the financial reporting standards which view treasury stock as a temporary reduction in capital. Further, our comparison of the characteristics of firms using each method indicates that a firm's choice of accounting method is not random but is associated with asset growth, cash holdings, price–earnings ratio and industry membership. We also find evidence that firms' choice of method and firm characteristics associated with each method were influenced by regulatory changes in 2004 that increased the transparency of repurchase activities. Finally, we find evidence that a firm's choice of accounting method to report share repurchases is related to the firm's propensity to make future repurchase transactions. A *Retire* firm's idiosyncratic risk reduces the likelihood of a repurchase transaction more so than a *Treasury* firm reporting similar risk, and this risk impact grows stronger after the increased disclosure regime. Further, *Treasury* firms more likely repurchase at lower price earnings multiples, increasing the likelihood that *Treasury* firms make more economically efficient repurchase transactions over comparable *Retire* firms.

Our finding that a firm's method used to record share repurchases is related to meaningful firm characteristics and economic behavior has implications for analysts and researchers. Ratios using retained earnings, such as ratios assessing a firm's default risk, are affected by the firm's repurchase intensity and its accounting method to record share repurchases. Additionally, since past repurchases are less transparent for *Retire* firms than for *Treasury* firms, *Retire* firms appear more likely to engage in share repurchase transactions, which have a lower likelihood of increasing shareholder value. From an information perspective, the treasury method appears to dominate the retirement method, providing finer information, but firms in many states are prohibited by law from providing this information.

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## Appendix A. Variable definitions

Variable	Definition
%RP	Ratio of cash paid to repurchase common shares, measured as PRSTKC less changes in preferred stock to the MVE at the end of the prior year. If this ratio is missing or less than 0.5%, this variable is set to 0.
AGR	Growth in the book value of assets (AT) from $t - 1$ to $t$ .
Antidilute	Weighted average diluted shares (CSHFD) less the weighted average basic shares (CSHPRI) divided by the weighted average basic shares. This variable is measured as of the end of the prior fiscal year.
CASH	The ratio of cash and marketable securities (CHE) to book value of assets (AT) at $t - 1$ .
CF	Operating income before depreciation (OIBDP) less cash paid for taxes (TXPD) less interest expense (XINT) less cash paid for preferred and common dividends (DV) divided by the book value of assets (AT) at the end of the prior year.
Divpayer	Indicator variable measured as 1 for firms making a cash dividend (DV) in the current year.
EP Ratio	The ratio of diluted earnings per share excluding extraordinary items (EPSFX) to closing price (PRCC_F), calculated at the end of the prior fiscal year.
FutureAcq	Indicator variable measured as 1 if a firm makes an acquisition in $t + 1$ where the target firm increases the sample firm's assets or revenues by at least 15% over the respective sales or assets reported in $t$ .
Hitech	Firms in the following 3-digit SIC codes according to Department of Commerce definitions: 283, 357, 366, 367, 382, 384, and 737.
Idio Risk	Firm specific idiosyncratic risk measured as the standard deviation of the residuals from a regression of a firm's daily excess returns (raw returns less the risk-free rate) on the market factor (i.e. the value-weighted market return less the risk-free less rate) as per Hoberg and Prabhala (2009).
LEV	The book value of debt (DLT) plus current portion of long-term debt (DLTT) divided by book value of assets (AT) at $t - 1$ .
MB	The ratio of the market value of the firm's assets to the book value of the firm's assets (AT), where the market value is determined as market value of equity (MVE) plus the book value of debt (determined as total assets (AT) minus common equity (CEQ)), measured at the end of the prior year.
MVE	Market capitalization measured as shares outstanding (CSHO) times fiscal year end closing price (PRCC_F) adjusted for stock splits and stock dividends (AJEX).
RE < 0	Indicator variable measured as 1 for any firm with current year retained earnings balance (REUNA) less than 0.
Retire Firm	Indicator variable equal to 1 for a repurchasing firm with zero or unchanged treasury stock balance (TSTKC).
Return <sub>t-1</sub>	Firm return cumulated over the 250 trading days preceding the beginning of year $t$ less the value-weighted CRSP index for the respective trading days.
Return <sub>t</sub>	Firm return cumulated over year $t$ less the value-weighted CRSP index for the respective trading days.
ROA	Income before taxes (IB) divided by the book value of assets (AT) at the end of the prior year.
RP Firm	Indicator variable equal to 1 for a firm with PRSTKC divided by MVE at $t - 1$ greater than or equal to 0.5% in the current or prior two years.
RP Year	Indicator variable measured as 1 for any firm observation where the cash outflow for the purchase of common stock (PRSTKC) less changes in preferred stock is more than 0.5% of prior year market capitalization.
Treasury Firm	Indicator variable equal to 1 for a repurchasing firm with a nonzero and changing treasury stock balance (TSTKC).

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