The Usefulness of Selective Tax Return Disclosure: Evidence from Form 5500

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Abstract

We examine whether and why tax returns can provide decision-relevant information to equity investors. Specifically, we examine whether information regarding defined-benefit pension plans contained in a publicly disclosed tax form, Form 5500, is useful to equity investors. Using intra-day returns and disclosure times obtained through a Freedom of Information Act request, we find that markets quickly react to Form 5500 information regarding pension funding and expenses. We also provide evidence that Form 5500 information is more strongly associated with market value and future cash contributions than comparable financial statement information. Further, although GAAP does not require firms to disaggregate the pension liability, we find evidence that the market values the components of the Form 5500 liability attributable to retired and terminated employees differently than the liability attributable to current employees. This paper documents that tax returns contain unique information content that investors can and do use, and contributes to the policy debate over whether corporate tax returns should be publicly disclosed.

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1. Introduction

A debate over whether corporate tax returns should be publicly available has raged since the earliest days of the U.S. income tax system (Lenter, Slemrod, and Shackelford 2003), and has been held in numerous countries around the world (Hasegawa et al. 2013; Bø, Slemrod, and Thoresen 2015; Hoopes, Robinson, and Slemrod 2018). A major issue in this debate is whether corporate tax returns can provide any useful information to corporate stakeholders. Considerable arguments exist for why corporate tax returns would (McGill and Outslay 2004; Everson 2008; Morris 2015) and would not (Manzon and Plesko 2002; TEI 2006; Morris 2015) provide useful information to corporate stakeholders, and recent evidence is mixed as to whether tax returns contain information that aids equity investors in valuing companies (Hoopes, Robinson, and Slemrod 2018; Demeré 2018). Additionally, prior evidence is unclear about what specific pieces of the tax return provide useful information to equity investors and why tax returns would be useful to equity investors at all. In this paper, we seek to address these empirical questions using data from a publicly available U.S. tax form, Form 5500.[1]

Form 5500 is a tax form that was developed jointly by the Internal Revenue Service (IRS), Department of Labor (DOL), and Pension Benefit Guarantee Corporation (PBGC) (DOL 2017; IRS 2018a) and flows directly into the corporate income tax return (Wasser 2014; IRS 2018b). Form 5500 contains significant detail on a firm's defined benefit pension plans, which continue to have significant implications for the income of many U.S. and international firms (Cadman and Vincent 2015; PBGC 2017; Anantharaman and Chuk 2018a). Previous research examining the value of tax return information either utilizes the public disclosure of a limited number of summary

[1] Throughout the paper, we refer to Form 5500 and its related schedules simply as "Form 5500."

numbers from the corporate tax return (Hoopes, Robinson, and Slemrod 2018) or cannot directly identify the tax return information that investors have access to (Demeré 2018). Conversely, Form 5500 is a rich, multi-page form with multiple schedules that contain significant detail on a firm's pension assets, liabilities, and expenses as computed using tax accounting. The Form 5500 not only allows us to identify the information investors receive, but also exactly when they receive this information. Through a Freedom of Information Act (FOIA) request filed with the Employee Benefits Security Administration (EBSA), we obtain the time (to the second) when a Form 5500 filing was received and when it was disclosed publicly.

To examine the informativeness of tax return data included on the Form 5500, we begin by examining market reactions to the release of Form 5500s to the public. We use intra-day return data around the exact time of online Form 5500 publishing, and find that investors react to key summary items from the Form 5500 (i.e., the pension funding percentage and pension expense) within five minutes of public disclosure. This evidence strongly suggests that tax return data is valuable to investors incremental to the information contained in financial statements.

We next examine *why* the Form 5500 is useful to investors. Theoretically, there are two primary reasons why tax returns would be useful to investors. First, tax returns may contain brand new value-relevant information that investors could not obtain through GAAP financial statements. Second, tax returns may report the same "information" as previously reported to investors in GAAP financial statements (e.g., pension expense or pension liabilities), but offer a different measurement perspective (e.g., tax accounting vs. GAAP). As modelled by Blackburne and Blouin (2016) and Dhaliwal et al. (2017), financial items produced under tax accounting rules (e.g., taxable income) can provide valuable information about firm performance and risk incremental to the same financial items produced under GAAP (e.g., pre-tax GAAP income) as

long as the measurement error from the tax and GAAP accounting systems is different. Because GAAP and tax accounting have very different objectives, they also have very different sources of noise (Manzon and Plesko 2002).[2]

To test the "why" of tax return informativeness, we aggregate Form 5500 information within firm (one firm can have multiple pension plans, and thus multiple Form 5500s) and utilize a value relevance framework to compare the association between market value and GAAP pension information relative to the association between market value and Form 5500 information measured over the same time period. We find that the net funded position reported on Form 5500 is more strongly associated with market value than the net funded position reported in GAAP financial statements. This evidence suggests that the tax accounting in Form 5500 provides a valuable alternative measurement perspective on pension information to investors relative to GAAP pension information.

We also examine the information content of Form 5500 information by comparing the association of Form 5500 and GAAP information with future cash contributions to the pension fund. We find that the Form 5500 pension expense is more strongly associated with future cash contributions to the pension fund relative to GAAP pension expense, consistent with tax accounting helping investors better predict future pension outcomes than access to GAAP financial statements alone.

Next, to examine whether the market values information from the Form 5500 that is not required to be disclosed under GAAP, we examine the disaggregated components of the Form

[2] For example, tax accounting is often restrictive in requiring specific assumptions and calculations that may not map to economic fundamentals, and contains tax subsidies (e.g., bonus depreciation) that distort the ability of tax items to measure economic fundamentals. Comparatively, GAAP offers a lot more flexibility to managers in mapping GAAP items to economic fundamentals, but this flexibility also allows for estimation error and opportunistic earnings management. Pension accounting under GAAP is noisy and particularly susceptible to managerial manipulation (Amir and Benartzi 1998; Bergstresser, Desai, and Rauh 2006; Kisser, Kiff, and Soto 2017; Stefanescu et al. 2018).

5500 pension liability. We find that, in both intra-day returns and value relevance tests, the market puts the most negative emphasis on the portion of the Form 5500 liability owed to retired employees. In contrast, the portion of the Form 5500 liability owed to current employees exhibits a positive association with market value.[3] We are the first paper to document that investors price the disaggregated components of a firm's pension liability differently, with the portion of the liability owed to current employees exhibiting a positive association with market value. These results are also consistent with the Form 5500 providing unique value-relevant information to investors that they could not otherwise obtain.

In further analyses, we show that information from the Form 5500 is also more relevant to the cost of equity capital than comparable GAAP information. Finally, we examine how the usefulness of Form 5500 information changed around a significant change in tax accounting for pensions brought about by the Moving Ahead for Progress in the 21st Century (MAP-21) Act in July 2012 (Dambra 2018). Intended to provide funding relief for defined benefit plan sponsors following the financial crisis of 2007-2008, MAP-21 permitted the use of a 25-year smoothed interest rate, instead of a two-year average rate, to discount pension liabilities to their present value. As a result, there was a dramatic decrease in the present value of Form 5500 pension liabilities, and thus decreased minimum contribution requirements. However, this law also resulted in increased smoothing of Form 5500 pension liabilities. Consistent with smoothing in the tax setting being informative (Demeré et al. 2019), we find that Form 5500 funded position is more strongly associated with market value following MAP-21.

Our study contributes to the debate over public disclosure of tax returns (Lenter, Slemrod,

[3] While it may seem counter-intuitive to find a positive association between a liability and market value, this finding is consistent with the well documented "service cost anomaly," (i.e., a positive association between market value and the service cost component of pension expense) first shown by Barth et al. (1992). Researchers suggest that the service cost anomaly exists because service cost proxies for value created by human capital.

and Shackelford 2003; Morris 2015; Hoopes, Robinson, and Slemrod 2018) by showing that pension plan tax returns contain information that is incrementally useful to investors beyond the information contained in the financial statements. Further, by showing that Form 5500 information can better predict future pension outcomes relative to financial statement numbers, we empirically document the value of having access to performance measures based on both GAAP and tax accounting, supporting theory developed in the tax literature (Shevlin 2002; Blackburne and Blouin 2016). We also contribute to the literature on the value relevance of pension information (Landsman 1986; Barth 1991; Barth, Beaver, and Landsman 1992; Chen et al. 2015) by documenting another source of value-relevant pension information that investors use that is not included in the financial statements: Form 5500 tax returns. Our findings suggest that financial accounting standard setters could use the Form 5500 to consider which pension disclosures (e.g., pension liability disaggregation) and accounting methods (e.g., smoothing of rates used to discount pension liabilities) would add value to the users of financial reporting information.

Our study continues in Section 2 with background on income tax return disclosure and pension accounting and the development of our hypotheses. Section 3 summarizes our data and empirical methodology and Section 4 describes our empirical results. Section 5 concludes.

2. Background and hypothesis development

2.1 Tax Return Disclosure Usefulness and Form 5500

The debate over public disclosure of tax returns has a long and colorful history (Lenter, Slemrod, and Shackelford 2003; Kornhauser 2010). This debate has continued into the current day, with an emphasis on debating the public disclosure of corporate tax returns (Everson 2008; Morris 2015; Hoopes, Robinson, and Slemrod 2018). Opponents of public disclosure of corporate tax returns argue that corporate tax returns do not contain any useful information to corporate

stakeholders that cannot also be obtained from financial statements, and that tax returns have the potential to confuse and even mislead investors (TEI 2006). Evidence from the disclosure of taxable income and taxes paid from the tax return in Australia suggests that investors do not react to any incremental information from this tax return information (Hoopes, Robinson, and Slemrod 2018). Further, opponents also raise concerns about corporations reacting to disclosure by manipulating tax reporting. Evidence from international settings with limited tax return disclosure suggests that firms will manipulate their taxable income to fall below a taxable-income threshold that triggers disclosure (Hasegawa et al. 2013; Hoopes, Robinson, and Slemrod 2018).

Conversely, proponents of public corporate tax return disclosure argue that tax returns do contain valuable information to corporate stakeholders that cannot be obtained from financial statements (McGill and Outslay 2004; Everson 2008; Morris 2015). Examining U.S. markets, Demeré (2018) shows that investors that likely receive some tax return information from the syndicated loan market (a) incorporate that information into their valuations and (b) price tax-related information more efficiently. Proponents of public disclosure also suggest that misreporting in tax returns may decrease following public disclosure (Morris 2015). The reasoning behind this argument is that public disclosure will increase the ability of corporate stakeholders (e.g., investors, analysts, lenders, employees, and labor unions) to monitor and constrain tax misreporting and aggressive tax strategies. Additionally, public disclosure will allow corporate stakeholders, competitors, and concerned citizens to monitor a firm's tax disclosures and report firms that do not report honestly to tax authorities, who have limited resources and can use this assistance to discipline misreporting firms more effectively (Nessa et al. 2018). Evidence from Norway suggests that business owners will report higher taxable income when their neighbors have easier access to their personal tax returns, consistent with tax return disclosure reducing

misreporting on the tax return (Bø, Slemrod, and Thoresen 2015).

Currently, empirical evidence regarding whether tax return disclosure is beneficial is mixed. While more research is needed to inform this debate, research is hampered by the lack of available settings. As summarized by Demeré (2018), there are only a few settings where tax return information is (or has been) disclosed publicly. Most of these settings involve either significant data access restrictions (e.g., Scandinavia), the disclosure of only a couple summary tax items (e.g., Australia), severe data limitations (e.g., Japan), or an inability to identify specific tax return information (e.g., syndicated loan markets).

In this paper, we use a setting that is new to the tax return disclosure debate, but has been referenced in the literature on defined benefit pension plans: Form 5500. Form 5500 is a tax form that was developed jointly by the Internal Revenue Service (IRS), Department of Labor (DOL), and Pension Benefit Guarantee Corporation (DOL 2017; IRS 2018a). However, unlike most U.S. federal tax forms that are only filed with the IRS, plan sponsors must also file the Form 5500 with the Department of Labor. All pension benefit plans covered by the Employee Retirement Income Security Act (ERISA) of 1974 are required to file Form 5500 annually, with the Form 5500 due by the last day of the seventh month following the plan year-end.[4]

Because Form 5500 is superficially just an annual information return (26 U.S. Code §6058) that is also used in assessing relevant excise taxes (26 U.S. Code §4972), it may not seem relevant to the debate over public disclosure of tax returns, which largely focuses on the disclosure of income tax returns. However, Form 5500 has two important characteristics that make it relevant

[4] Pension benefit plans covered by ERISA include defined benefit pension plans, profit-sharing plans, and employer-sponsored 401(k), 403(b), and individual retirement account plans. These filing requirements are given in §1023 of the U.S. Labor Code (Title 29 of the U.S. Code) and §6058 of the Internal Revenue Code (Title 26 of the U.S. Code). ERISA does not cover foreign or multiemployer pension plans. Therefore, Form 5500 data will only have information on domestic single-employer pension plans. We discuss the effect of this measurement error for our analyses in the research design section of the paper.

in evaluating the impact of income tax return disclosure. First, the Form 5500 directly feeds into the corporate income tax return, as pension and profit-sharing plan expense from Form 5500 flows into the calculation of taxable income on page 1 of the corporate income tax return (Form 1120) and the IRS actively reconciles these amounts in income tax audits (Asthana 1999; Wasser 2014; IRS 2018b).[5] As such, the Form 5500 plays a role similar to numerous tax forms that are filed as part of the corporate income tax return to provide support for deductions taken in computing taxable income.[6] Second, Form 5500 contains significant detail on the assets, liabilities, and expenses of pension plans, and all amounts in the Form 5500 are computed in accordance with the tax accounting rules in the Internal Revenue Code. A key reason why tax returns might be useful to investors is the different measurement perspective created by tax accounting vs. U.S. GAAP (Blackburne and Blouin 2016; Dhaliwal et al. 2017), and the Form 5500 allows us to directly examine the benefit of this alternative tax accounting framework relative to GAAP.

Another important feature of the Form 5500 is that it is made publicly available after filing.[7] Specifically, the Employee Benefits Security Administration (EBSA), as part of the Department of Labor, processes Form 5500 filings and publishes them once processing is complete. In early 2010, the EBSA updated the "EFAST" system used to collect, process, and disclose Form 5500 (EBSA 2010). Prior to 2010, the original EFAST system allowed for limited

[5] See line 23 of the 2018 Form 1120. Reconciling pension expense from the Form 5500 and Form 1120 is part of an ongoing project by the Employee Plans Compliance Unit of the IRS (IRS 2018b).
[6] Examples of these include Form 4562 to support depreciation and amortization deductions, Form 1125-A to support cost of goods sold deductions, and Form 4797 to support gains and losses on business asset sales.
[7] §6103 of the Internal Revenue Code (Title 26 of the U.S. Code) prevents the disclosure of most tax returns except in rare cases, such as disclosure to state tax agencies or to other federal agencies who are pursuing a criminal prosecution. Form 5500 disclosure is governed by the U.S. Labor Code (Title 29 of the U.S. Code) rather than the Internal Revenue Code, and is required to be publicly disclosed per §1026 of Title 29. Congress's intent in making this form public was to protect the participants in employee benefit plans by giving them the information necessary to monitor plans and make well-informed decisions (Miles 1998).

electronic filing, though many Form 5500 filings were still paper filed.[8] This meant that, once a sponsor filed the Form 5500, it could take months before the filing was processed and publicly disclosed. However, since the new EFAST2 system with mandatory electronic filing came online in 2010, processing of Form 5500 filings has become relatively instantaneous. For example, across the population of Form 5500 filings from March 2010 until August 2017 received through our FOIA request, we find that the EBSA made publicly available over 95% of all filings in a processed electronic form within 9 minutes of the electronic filing being received by the EBSA.

Given this increase in the timeliness and accessibility of Form 5500 information, interest in the Form 5500 has risen over time. As part of our FOIA request, the EBSA provided us with basic detail about the cumulative annual searches for Form 5500 filings through the EFAST2 system from January 2010 to August 2017. Two interesting patterns emerge from this information. First, it took the public a while following the implementation of EFAST2 to begin using the system to obtain Form 5500 data, with less than 1 million total Form 5500 searches up to October 2010. For comparison, from 2011 through 2016, there were between 4 and 6 million total annual Form 5500 searches. This is consistent with the previous system of largely paper filings not providing Form 5500 data in a timely or predictable manner, and with the public taking time to realize the significance of the change in data availability. Second, the search volume for Form 5500 filings appears to be increasing, with a 28.6% increase in search volume from 2015 to 2016, and 2017 search volumes through August on track to exceed 2016 volume. While we do not have detail on who is using the EFAST2 system to search for filings, we were told by the EBSA in telephone correspondence that there has been a growth in search requests that occur within seconds of a Form 5500 being published, to the point that the system will sometimes experience a lag following the

[8] In our telephone discussions with the EBSA, we were told that only about 1% of Form 5500 filers chose to file electronically in the last year of the original system.

publication of a Form 5500. This suggests a growth in automated programs that "scrape" Form 5500 data, though it is not clear to the EBSA how the public is using this data.

2.2 GAAP and ERISA Reporting

2.2.1 Comparison of GAAP and ERISA rules

While the FASB promulgates the pension accounting standards used for financial reporting purposes, federal law (i.e., ERISA) determines the required levels of pension funding using information contained in Form 5500 Schedule SB. The main purpose of ERISA is to set standards for pension plan sponsors, most importantly the standard for the minimum cash contributions (i.e., the minimum amount of cash a firm must contribute to its pension fund each year). Appendix A outlines a comparison of the GAAP and ERISA rules.

Both ERISA and GAAP require the estimation of the present value of plan liabilities based on a discount rate assumption. ERISA requires plans to discount future liabilities using three different interest rates published by the IRS (referred to as "segment rates"), depending on the length of time until the liabilities become due.[9] The short-term, mid-term, and long-term segment rates are used to calculate the present value of liabilities that will come due within five years, five to 20 years, and more than 20 years, respectively. On the other hand, GAAP discount rates are based on "rates of return on high-quality fixed-income investments currently available" (ASC 715-30-35-43). Under both sets of rules, the net liability (referred to as the "funding shortfall" under ERISA and the "net pension liability" under GAAP) is calculated as the excess of the present value of plan liabilities over the value of the plan assets.[10]

[9] The discount rates used to calculate the "funding target" (i.e., the present value of plan liabilities) are determined under Section 430(h)(2) of the Internal Revenue Code.

[10] Form 5500 reports two variations of plan assets; a market value of assets and an actuarial value of assets. The actuarial value of assets allows for the smoothing of investment returns over a two year period (and the value must be no less than 90% and no more than 110% of the market value of assets), to reduce the volatility in the plan sponsor's required minimum contributions. Following Dambra (2018), we utilize the "fair value" of ERISA plan assets rather than the "actuarial value" since the fair value more closely approximates the GAAP pension asset value.

Both sets of rules also require the calculation of a current year cost (i.e., an expense). Under ERISA, this is referred to as the "target normal cost" and is equal to the present value of pension liabilities expected to accrue during the plan year, including increases in past service benefits attributable to current year increases in compensation. Under GAAP, the "net periodic pension cost" (NPPC) is also based on the present value of benefits earned that year (i.e., the "service cost"), but also includes other amounts. For example, NPPC includes an interest cost, which represents the increase in the pension benefit obligation attributable to the passage of time, and is reduced by the expected return on plan assets.[11] The NPPC also includes portions of pension-related gains/losses and increases/decreases to prior service cost that occurred in previous periods.

GAAP pension accounting rules do not affect mandatory pension funding requirements. Instead, ERISA pension funding rules stipulate annual mandatory pension contributions to firms' pension plans via a tax-accounting formula. As funding status declines (i.e., the gap between discounted ERISA pension liabilities and pension assets increases), firms are required to contribute more to their pension plans. Specifically, if plan assets are less than the "funding target" (i.e., a "funding shortfall" exists), the required minimum contribution for the year is equal to the plan's "target normal cost" plus the amortization of the "funding shortfall" over 7 years.[12]

2.2.2 The Moving Ahead for Progress in the 21st Century Act (MAP-21)

Prior to the passage of MAP-21, the discount rate assumptions used to calculate the present value of plan liabilities under ERISA were derived from a yield curve of investment-grade corporate bonds averaged over the most recent 24 months. In contrast, GAAP bases discount rate assumptions on rates of return on high-quality fixed-income investments (i.e., corporate bond

[11] In contrast, the ERISA "target normal cost" is not affected by the change (or expected change) in ERISA assets/liabilities.

[12] If plan assets are greater than the "funding target," the minimum required contribution is the "target normal cost" reduced by the excess. See Appendix A for further detail

yields) available as of the end of the fiscal year. Thus, prior to the passage of MAP-21, differences existed in pension liability estimates produced by GAAP versus ERISA. For example, in its 2008 Form 10-K, Boeing Inc. stated: "At December 31, 2008 our pension plans were $8,420 million underfunded as measured under GAAP and, in the aggregate, approximately $3,000 million underfunded as measured under [ERISA]."

Firms had argued for pension funding relief since the Pension Protection Act of 2006, a rule that reduced the amortization of funding shortfalls from 30 years to seven (Campbell, Dhaliwal, and Schwartz 2010; Dambra 2018). However, the call for funding relief became even stronger following the financial crisis of 2007-2008, as firms' minimum required contributions skyrocketed due to falling interest rates (including corporate bond rates) and poor asset returns. Congress eventually passed pension funding relief as part of MAP-21, which was signed into law by President Obama on July 6, 2012.

Under MAP-21, the interest rate used to discount ERISA pension liabilities to present value went from a two-year average to a 25-year average of investment-grade bond yields. After the rule change, discount rates increased by 179.8 percent for pension liabilities due within five years, 35.1 percent for pension liabilities due between five and 20 years, and 21.5 percent for pension liabilities due after 20 years (Society of Actuaries 2012, Dambra 2018). Consequently, MAP-21 significantly decreased the present value of ERISA pension liabilities and, ultimately, decreased mandatory contributions. Using a sample of observations similar to ours, Dambra (2018) finds that MAP-21 decreased estimated mandatory contributions by approximately 44 percent in 2012, 51 percent in 2013, 34 percent in 2014, and 8 percent in 2015, resulting in a reduction in estimated mandatory contributions of $190 billion through 2015.

Following MAP-21 implementation, the American Benefits Council sent a comment letter to the FASB and SEC in November of 2012. The comment letter urges the FASB to allow valuation of liabilities for accounting purposes in a similar manner to how liabilities are valued for funding purposes under MAP-21 (American Benefits Council 2012). However, ASC 715 continues to require firms to base the discount rate assumption on *current* corporate bond yields. Thus, following the passage of MAP-21, the GAAP and tax rules became more divergent, likely altering the relative information content of pension information produced by these competing rules.

2.3 Pensions and Investors

Defined benefits pension plans, while slowly waning in popularity, remain powerful forces in the U.S. For example, 26% of all Compustat firms, accounting for 61% of Compustat firm market capitalization, had defined benefit pension plans in 2014 (Anantharaman and Chuk 2018a), while approximately 40 million Americans are due benefits under one of these plans (PBGC 2017). This includes approximately 40% of CEOs of large U.S. firms, with defined benefit pension plans making up approximately 15% of their total annual compensation and 23% of CEO wealth held inside the firm (Cadman and Vincent 2015). Their importance has motivated prior studies that examine the determinants of pension funding/contributions (Francis and Reiter 1987; Thomas 1988; Asthana 1999; Gaertner, Lynch, and Vernon 2018) and pension plan asset allocations (Frank 2002; Amir, Guan, and Osswald 2010; Chuk 2013; Barthelme, Kiosse, and Sellhorn 2018; Anantharaman and Chuk 2018a).

Aside from studies that examine the funding and operations of pension plans, defined benefit pensions have also provided a rich setting in which to examine numerous research questions. This richness is due in part to the imposition of mandatory minimum pension contribution levels by ERISA (e.g., 29 U.S. Code §1082) aimed at ensuring firms are able to

provide the pension benefits promised to employees. Variation in these mandatory contribution levels thus represents variation in the availability of internal funds, and has been used to examine how changes in internal fund availability affect firm value, investment, working capital, hiring, shareholder payouts, and tax avoidance (Rauh 2006; Franzoni 2009; Campbell, Dhaliwal, and Schwartz 2010; Bakke and Whited 2012; Kubick, Lockhart, and Robinson 2014; Dambra 2018; Campbell, Goldman, and Li 2018). In some circumstances, even the assets in an overfunded (i.e., pension assets exceed pension liabilities) pension plan can be used as an additional source of internal finance (Thomas 1989).[13]

Another stream of research in the defined benefit pension setting is based on the complexity of pension accounting, which requires numerous actuarial and rate of return estimates that can drastically change pension amounts on the income statement and balance sheet, yet are subject to considerable managerial discretion. Prior research suggests that there is considerable noise in these estimates (Amir and Benartzi 1998). Managers often use the discretion available to the estimates to manipulate earnings, reduce the firm's mandatory pension contributions, and extract personal rents through the pension plan (Asthana 1999; Bergstresser, Desai, and Rauh 2006; Kisser, Kiff, and Soto 2017; Stefanescu et al. 2018). Additionally, managers will take greater risks with the assets of the pension to support aggressive rate of return estimates (Anantharaman and Chuk 2018a). However, not all managerial discretion in pension accounting is harmful, as Hann, Lu, and Subramanyam (2007) document that investors find the discretion in computing pension benefit obligations value relevant.

Finally, and directly connected to our study, is a line of literature that examines the value

[13] More generally, pension assets and liabilities can affect the capital structure choices of firms. Off-balance-sheet pension assets and liabilities explain a significant portion of the gap between observed and theoretically-optimal capital structures (Shivdasani and Stefanescu 2010).

relevance of pension information in the income statement, balance sheet, and financial statement footnotes (Daley 1984; Landsman 1986; Barth 1991; Barth, Beaver, and Landsman 1992). This literature generally suggests that investors (a) adjust their valuation of various pension items in accordance with the information contained in each item (Barth, Beaver, and Landsman 1992), (b) incorporate some of the information from the pension footnote into their valuations (Barth 1991), (c) adjust their valuations for the risk associated with pension plans (Jin, Merton, and Bodie 2006), (d) find value-relevant information in pension-related reclassifications of other comprehensive income into net income (Cussatt, Pollard, and Stone 2018), and (e) incorporate some off-balance-sheet pension liabilities into their valuations, although the degree to which investors consider off-balance-sheet pension liabilities depends on disclosure quality and investor sophistication (Yu 2013; Chen et al. 2015). Credit rating agencies also adjust their ratings in accordance with information about pension liabilities (Maher 1987; Carroll and Niehaus 1998; Chen et al. 2015).

While investors do use and value information about firms' pension plans, there is also considerable evidence that they do not fully incorporate all information available in the financial statements into their valuations. Firms' pension funded status and off-balance-sheet liabilities as reported in the financial statements are associated with future abnormal returns and analyst forecast errors (Landsman and Ohlson 1990; Franzoni and Marin 2006; Picconi 2006). Investors may also have difficulties understanding how to balance pension information that is alternately reported at both historical cost and fair value (Coronado and Sharpe 2003; Hann, Heflin, and Subramanyam 2007).

2.4 Hypotheses Development

Given that investors struggle to incorporate pension information from the financial statements into their valuations, it is important to consider whether investors might benefit from

additional information about pensions or changes to pension accounting rules. One alternate source of information about pensions comes from tax returns, and in particular the Form 5500. There are two reasons why the Form 5500 may be useful to investors incremental to the financial statements.

First, Form 5500, like most tax return forms, contains a significant amount of detail that is not included in the financial statements. For example, the Form 5500 and related schedules disaggregate the plan liability, referred to as the "funding target" on Form 5500, into benefits due to current employees and those due to non-employees (i.e., retirees and terminated vested participants). Form 5500 also provides more information on many of the assumptions used to determine both the present value of existing liabilities (i.e., the funding target) and liabilities expected to accrue during the plan year. For example, Form 5500 provides information on the assumed weighted average retirement age of participants and mortality assumptions, which are not required to be disclosed in a firm's financial statements. Form 5500 also provides a direct calculation of the minimum required pension contribution for the current year, which determines how much companies must contribute to their pension plan and has important implications for firm value, investment decisions, earnings management, and tax avoidance (Asthana 1999; Rauh 2006; Franzoni 2009; Campbell, Dhaliwal, and Schwartz 2010; Campbell, Goldman, and Li 2018). If this detail provides investors and other corporate stakeholders a better understanding of the nature of a firm's compensation obligations to its employees, as well as how these payment obligations evolve over time, then they may be able to develop better expectations of both future pension expense and the value of the firm's human capital.

Second, because Form 5500 income and expenses are computed using tax accounting, rather than GAAP, Form 5500 and other tax returns offer investors and other corporate stakeholders an alternate measurement of a firm's pension performance. As formally modelled by

Blackburne and Blouin (2016) and Dhaliwal et al. (2017), items produced under tax accounting rules can provide valuable information about firm performance and risk incremental to items produced under GAAP standards as long as both items measure firm performance and/or risk and the measurement error from the tax and GAAP accounting systems is different. Because GAAP and tax accounting were developed with very different objectives in mind, they have very different sources of noise (Manzon and Plesko 2002). Tax accounting generally has more restrictions on recognition and timing to prevent taxpayers from being able to manipulate their tax payments, which comes at the cost of potentially making income and expense items less representative of the underlying economics of a transaction.[14] Tax accounting also includes incentives to engage in certain activities (i.e., tax subsidies), which can add significant amounts of noise to tax accounting measures. Conversely, the increased flexibility in GAAP reporting can allow managers to make accounting choices that achieve certain opportunistic goals (e.g., manipulating earnings, increasing liquidity, extracting personal rents, etc.) at the cost of faithfulness to the true economic fundamentals. Given that pension accounting under GAAP is noisy and particularly susceptible to this type of managerial manipulation (Amir and Benartzi 1998; Bergstresser, Desai, and Rauh 2006; Kisser, Kiff, and Soto 2017; Stefanescu et al. 2018), having tax accounting numbers available may provide particularly useful in this setting.

However, as opponents of public tax return disclosure claim, the additional information in Form 5500 may not be material to investors or others if all material information about a firm's pension plan is already included in the financial statements. For example, Campbell, Dhaliwal, and Schwartz (2012) document that mandatory pension contribution information in Form 5500 can be predicted using financial statement information. It is also not clear how much benefit tax

[14] For example, the IRS prescribes specific discount and mortality rates to be used in Form 5500 reporting, while firms have discretion in choosing these rates under GAAP reporting.

accounting will provide relative to GAAP accounting in the pension setting. This is particularly true given that Form 5500 is not required to be filed until seven months after the fiscal year end, or several months after pension information in financial statements has typically been provided publicly (Campbell, Dhaliwal, and Schwartz 2012).[15]

In summary, it is unclear whether Form 5500 provides incremental information that is useful to investors. However, it is important to understand whether Form 5500 does contain information incremental to financial statements, both for the implications this answer has for the debate over public disclosure of corporate tax returns and for understanding what pension-related information investors use to value firms.

We specifically examine whether investors react to the disclosure of Form 5500 using short-window returns around Form 5500 disclosure times we obtained in a FOIA request. Given that it is unclear whether and how much information investors may find in Form 5500, we frame our hypothesis in the null as:

Hypothesis*: There are no short-window return reactions around Form 5500 disclosure.*

We also dig deeper with two research questions regarding what information in the Form 5500 may be particularly relevant to investors. As stated above, information in the Form 5500 could be valuable if it either (a) provides useful information that GAAP does not provide or (b) provides the same information as GAAP, but using an alternative measurement scheme (i.e., tax accounting) with different sources of measurement error than GAAP. We attempt to examine whether one or both of these sources of information value exist within the Form 5500 by examining whether information contained solely in the Form 5500, as well as information contained in both

[15] An additional 2.5-month extension to file Form 5500 can also be obtained by filing a Form 5558, with the only requirement to obtaining an extension of time to file being that an extension of time to file also has to have been requested for the corporate income tax return.

the Form 5500 and GAAP financial statements, contains incremental value relevance and predictive ability over GAAP pension information. Our two research questions are:

> ***Research Question 1****: Is information contained in the Form 5500 more strongly associated with market value and cash contributions to the pension fund relative to similar information provided in GAAP financial statements?*
>
> ***Research Question 2****: Does information contained in the Form 5500, but not in GAAP financial statements, appear to be priced by the market?*

3. Empirical methodology

3.1 Data and sample selection

Table 1 describes our sample selection process. We begin by matching ERISA pension plan data (Form 5500s) to Compustat by EIN.[16] To match non-direct EIN matches to Compustat data, we utilize the hand-collected data from Dambra (2018). Dambra (2018) matches each non-direct EIN match (with assets above $10 million) to Compustat by searching D&B, Hoovers, SEC.gov, or Google Inc. In total, we are able to match Compustat identifiers to 16,441 Form 5500s belonging to 1,160 unique firms and spanning the years 2009-2016 (Table 1 Panel A).[17] To facilitate the aggregation of form 5500 data within firm, we drop firms that do not have the same valuation date for all 5500s in a given year. Our final Form 5500/Compustat matched sample is 14,379 Form 5500s belonging to 1,148 unique firms.

To evaluate the short-window market response to the release of Form 5500 information, we submitted a FOIA request to the EBSA and obtained the time (to the second) when a Form

[16] Form 5500 data is publicly available at: https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/public-disclosure/foia/form-5500-datasets, while individual Form 5500 filings can be searched for using the search tool at: https://www.efast.dol.gov/portal/app/disseminate?execution=e3s1.

[17] We construct our sample by adapting the methodology used in Dambra (2018). Untabulated descriptive statistics for our Form 5500 data over the sample period in Dambra (2018) are very similar to the descriptive statistics for the Form 5500 data used by Dambra (2018).

5500 is filed and when it is released to the public via the EFAST2 system. We then match our Form 5500/Compustat sample to Trade and Quote (TAQ) data (Table 1 Panel B). Due to data restrictions surrounding subscription limitations, we are only able to obtain TAQ data for the years 2009-2013. Thus, for our TAQ analyses, we drop 7,718 Form 5500 observations belonging to years 2014-2016. Next, we drop 289 observations with missing (or zero) Compustat data, 303 observations with missing (or zero) ERISA data, 32 observations with a price below $1 or market value below $1,000,000, and 151 duplicate observations. Our final TAQ sample is 5,882 Form 5500 observations belonging to 779 unique firms.

To evaluate the usefulness of Form 5500 information relative to corresponding pension information contained in a firm's financial statements (i.e., 10-K), we aggregate Form 5500 data within firm (Table 1 Panel C). We then align Form 5500 and financial statement data so that they address the same fiscal period. As shown in the example in Figure 1, this is easy to do with pension expense items. The financial statement pension expense for 2013 will be reported in the 2013 10-K, which is typically released within 60 days of the end of the fiscal year, while the Form 5500 pension expense for 2013 will be reported in the 2013 Form 5500, which is typically released within 7 to 9.5 months following the end of the fiscal year.[18] However, this is more difficult for pension assets and liabilities. Financial statement assets and liabilities are measured as of the end of the fiscal year (e.g., 12/31/2013) and are typically reported within 60 days of the fiscal year end. However, Form 5500 assets and liabilities are reported as of the beginning of the fiscal year (e.g., 1/1/2013), meaning that the 2014 Form 5500 contains the pension assets and liabilities that map to the assets and liabilities reported on the 2013 financial statements. Given that, we match ERISA asset and liability data for plan year *t* to Compustat data for fiscal year *t-1*. This allows us to match

[18] The Form 5500 pension plan year is usually the same as the fiscal year for financial statements.

ERISA and GAAP measurements of pension assets/liabilities at the same point in time.

We drop 2,637 Form 5500s belonging to 225 firms that have Form 5500 valuation dates that are more than 1 day different then the corresponding matched fiscal year end (i.e., we only keep observations where plan year and fiscal year align). Next, we aggregate the Form 5500 data and reduce the sample to one observation per firm-year, leaving us with 6,323 firm-year observations belonging to 923 unique firms. Finally, we drop 718 firm-year observations with missing (or zero) Compustat data, 1,462 firm-year observations with missing (or zero) ERISA data, and 77 firm-year observations with a price below $1 or market value below $1,000,000. Our final aggregated Form 5500 sample is 4,066 firm-year observations belonging to 780 unique firms.

3.2 Empirical Design

To test our hypothesis, we begin by examining short-window returns around the publication of Form 5500 data. As discussed in Section 2, processing and public disclosure of Form 5500 filings has become relatively instantaneous since the new EFAST2 system came online in January 2010. If Form 5500 contains information relevant to investors, then we expect to find a market reaction to this information upon its release to the public.

To investigate the short-window market reaction to the release of Form 5500 data, we estimate the following model:

$$Return_{it} = \beta_0 + \beta_1 5500FundedRatio_{jit} + \beta_2 5500ExpenseRatio_{jit} + \beta_3 GAAPFundedRatio_{it} + \beta_4 GAAPExpenseRatio_{it} + \beta_5 SIZE_{it} + \beta_6 BTM_{it} + Year\ FE + Industry\ FE + \epsilon_{it} \quad (1)$$

where $Return_{it}$ is the short-window return for firm *i* in year *t*. We estimate six variations of equation (1), each of which considers a different returns window surrounding the release of a Form 5500. We consider the following windows (in minutes around public disclosure): (-20, 0), (-5, 0), (0,

+5), (0, +15), (0, +30), and (0, +60).[19] 5500_FundedRatio (5500_ExpenseRatio) is the ratio of pension liabilities to pension assets (annual plan expense scaled by plan liabilities) reported in Form 5500 *j* for Firm *i* in period *t*. If the release of Form 5500 information is impounded in short-window investing decisions, we expect to see negative coefficient estimates for β_1 and β_2. To control for pension information already available via the most recent 10-K financial statements, we control for the GAAP funded ratio and GAAP annual plan expense (GAAP_%Funded and GAAP_ExpenseRatio, respectively) for Firm *i* in period *t*. We also control for firm size (SIZE) and book-to-market ratio (BTM), as well as year and industry fixed effects, and cluster standard errors at the plan level. Appendix B contains detailed variable descriptions.

To investigate the usefulness of aggregated Form 5500 data relative to corresponding pension information contained in a firm's 10-K (i.e., RQ1), we begin by comparing the association of aggregated Form 5500 and financial statement data with market value. Consistent with prior literature (Hann, Heflin, and Subramanyam 2007; Yu 2013; Chen et al. 2015), we use levels of market value rather than returns, as market value levels are better specified (Kothari and Zimmerman 1995) and better match our focus on information content (vis-à-vis timeliness; Barth, Beaver, and Landsman 2001). Using a simultaneous estimation framework, we estimate the following equations:

$$P_{it} = \beta_0 + \beta_1 BVX_{it} + \beta_2 5500NetFunded_{it} + \beta_3 NIX_{it} + \beta_4 5500Expense_{it} + Controls + Year\ FE + Industry\ FE + \epsilon_{it} \quad (2)$$

$$P_{it} = \beta_0 + \beta_1 BVX_{it} + \beta_2 GAAPNetFunded_{it} + \beta_3 NIX_{it} + \beta_4 GAAPExpense_{it} + Controls + Year\ FE + Industry\ FE + \epsilon_{it} \quad (3)$$

[19] Given our discussions with the EBSA, website lags of up to five minutes following the disclosure of a Form 5500 can occur due to automated web-scraping programs. As such, we set our shortest window to five minutes to adjust for potential information access delays due to this lag.

where P_{it} is the fiscal-year end price for firm *i* in period *t*, *BVX* is book value net of the GAAP net pension asset/liability, and *NIX* is net income net of the GAAP pension expense. In equation (2), we include our aggregated Form 5500 funded and liability measures: *5500_NetFunded* and *5500_Expense*, respectively. In equation (3), we include the corresponding GAAP amounts: *GAAP_NetFunded* and *GAAP_Expense*. Following prior literature (Hann, Heflin, and Subramanyam 2007; Hann, Lu, and Subramanyam 2007), we include control variables for sales growth, research and development expense, and the number of employees to control for the service cost anomaly (Barth, Beaver, and Landsman 1992). All explanatory variables in equations (2) and (3) are scaled by common shares outstanding.

To further test RQ1, we compare the usefulness of Form 5500 and financial statement data in predicting future cash contributions to a firm's pension plan. Using a simultaneous estimation framework, we estimate the following equations:

$$CC_{it} = \beta_0 + \beta_1 CCExpected_{it-1} + \beta_2 5500Expense_{it-1} + \beta_3 5500NetFunded_{it-1} + \beta_4 EMPCONT_{it} + Year\ FE + Industry\ FE + \epsilon_{it} \quad (4)$$

$$CC_{it} = \beta_0 + \beta_1 CCExpected_{it-1} + \beta_2 GAAPExpense_{it-1} + \beta_3 GAAPNetFunded_{it-1} + \beta_4 EMPCONT_{it} + Year\ FE + Industry\ FE + \epsilon_{it} \quad (5)$$

where CC_{it} is annual cash contributions for firm *i* in period *t* scaled by common shares outstanding. We also control for the expected pension contributions for the next year as estimated in the 10-K by management (CC_Expected) and the employee contributions to pension plans (EMP_CONT). We use employee contributions as a proxy for defined contribution plan contributions, as contributions to defined contribution plans may be included in cash contributions and introduce noise into our analyses.

Finally, we investigate whether information that is available via the Form 5500, but not

GAAP financial statements, is priced by the market (i.e., RQ2). Specifically, we investigate whether the market prices the disaggregated components of the plan liability differently depending on whether that liability corresponds to benefits earned by current, retired, or terminated employees. This disaggregation is not required under GAAP. Specifically, we estimate the following extensions of Equations (1) and (2):

$$\begin{aligned} Return_{it} = {} & \beta_0 + \beta_1 5500CurrentRatio_{jit} + \beta_2 5500TerminatedRatio_{jit} \\ & + \beta_3 5500RetiredRatio_{jit} + \beta_4 5500ExpenseRatio_{jit} \\ & + \beta_5 GAAPFundedRatio_{it} + \beta_6 GAAPExpenseRatio_{it} + \beta_7 SIZE_{it} + \beta_8 BTM_{it} \\ & + Year\ FE + Industry\ FE + \epsilon_{it} \end{aligned} \quad (6)$$

$$\begin{aligned} P_{it} = {} & \beta_0 + \beta_1 BVX_{it} + \beta_2 5500Assets_{it} + \beta_3 5500Current_{it} + \beta_4 5500Retired_{it} \\ & + \beta_5 5500Terminated_{it} + \beta_6 NIX_{it} + \beta_7 5500Expense_{it} + Year\ FE \\ & + Industry\ FE + \epsilon_{it} \end{aligned} \quad (7)$$

where *5500_Current, 5500_Retired, and 5500_Terminated* represent the portion of the aggregate 5500 liability owed to current, retired, and terminated employees, respectively. If the market values the portion of the liability belonging to these groups differently, we would expect to see significant differences in the coefficient estimates across these variables.

4. Results

4.1 Descriptive statistics and univariate results

Table 2 provides descriptive statistics for our TAQ sample (Panel A) and aggregated Form 5500 sample (Panel B). Panel A reveals that the average (median) Form 5500 funded ratio is 1.01 (1.00), suggesting that these plans are very well funded according to ERISA calculations for years 2009-2013. In contrast, the GAAP funded ratios have an average (median) of 1.37 (1.33). This difference is likely attributable to two things. First, Form 5500 does not include multiemployer

and foreign pension plans, while the GAAP measures do. Second, ERISA rules allow for a smoothing of the discount rate used to discount liabilities to present value (two-year average before MAP-21, twenty-five year average after MAP-21). Given that corporate interest rates have been declining since the early 1980's, the use of smoothed discount rates will lead to a higher discount rate assumption (i.e., lower present value of liability) relative to using a spot rate estimate, like the assumption under GAAP.

Table 2 Panel B presents descriptive statistics for the Aggregated 5500 sample. Similar to the plan-level descriptive statistics, the average Form 5500 funded percentage is 1.01, while the average GAAP funded percentage is 0.75. Further, we evaluate the relative differences between the GAAP and Form 5500 measures of pension assets and liabilities. %Difference_Asset (%Difference_Liability) is calculated as the absolute value of the difference between GAAP pension assets and Form 5500 assets (GAAP pension liabilities and Form 5500 pension liabilities) scaled by the GAAP pension asset (GAAP pension liability). The median (mean) absolute difference between ERISA and GAAP asset values is 11% (26%) while the median (mean) absolute difference between ERISA and GAAP liabilities is 35% (42%).[20] The larger absolute difference in pension liabilities relative to pension assets is likely due to the different methodology used to derive the discount rate assumption (i.e., smoothed rate vs spot rate), while pension assets are simply valued at market value under both ERISA and GAAP.

Lastly, turning to the variables used in our firm-level regression analyses, we see that Form 5500 expense per share (0.11) is less than half of GAAP pension expense per share (0.27). Further, reflecting the superior funded status determined Form 5500 calculations, we find that the Form

[20] Dambra (2018) finds a median (mean) absolute difference between GAAP pension assets and Form 5500 pension assets of 11% (22%), and does not summarize an absolute difference between GAAP pension liabilities and Form 5500 pension liabilities.

5500 has an average net pension asset of 0.06 per share, while the GAAP amounts reflect an average net liability of 2.20 per share.

4.2 Short-Window Market Reaction to Form 5500s

Table 3 presents the results of our short-window market reaction analyses used to test our Hypothesis. The six columns of Table 3 report the results of estimating equation (1) over the windows (in minutes): (-20, 0), (-5, 0), (0, +5), (0, +15), (0, +30), and (0, +60), respectively, where minute 0 is the exact minute where Form 5500 was publicly disclosed per our FOIA data. In columns 1 and 2, which precede Form 5500 disclosure, we find no evidence that any information in Form 5500 is leaking early to the market.

In columns 3 through 6, we document the market reaction following the release of Form 5500 information. We find negative and significant coefficient estimates for 5500_FundedRatio and 5500_ExpenseRatio, providing evidence of a short-window market reaction to Form 5500 information following the release of a Form 5500, in the direction expected for a liability and an expense, respectively. This evidence is consistent with tax return information being useful to equity investors and a rejection of our null hypothesis. Conversely, we also find a positive and significant coefficient estimate for GAAP_ExpenseRatio, which is opposite the direction typically expected for expense information upon its release. However, this reaction is consistent with investors over-relying on GAAP pension information and then backing out those value effects when better information comes along (Demeré 2018).[21] This reaction suggests that investors can trade more efficiently when they have access to tax return information and GAAP information. Together, these short-window return results indicate that investors find the information in Form

[21] As discussed in Blackburne and Blouin (2016) and Demeré (2018), these opposite signs can be produced when investors learn that some number they previously relied on contains noise, and so reduce the weight they place on the noisy information in their valuations. Also, given the very short windows we use, this reaction is almost certainly due to the release of Form 5500.

5500 relevant for pricing, leading us to reject our null hypothesis.

4.3 Usefulness of Form 5500 information relative to corresponding GAAP pension information

Given that Form 5500 contains information that is useful to investors, we next examine *why* Form 5500 is useful. While the results in Table 3 provide evidence consistent with the tax accounting in Form 5500 providing valuable measurement advantages incremental to GAAP reporting, we seek additional, long-run evidence in examining RQ1. Table 4 presents the results of the simultaneous estimation of equations (2) and (3), which allows us to compare the association of corresponding Form 5500 and GAAP pension information with market value. We find that both the Form 5500 and GAAP funded positions are significantly associated with market value in the expected direction. However, we also find a significant difference in the coefficient estimates across equations (p-value < 0.01), suggesting that the Form 5500 funded position is more relevant to investor pricing decisions than the GAAP funded position. We also find that Form 5500 information better explains market value overall through a Vuong test (p-value < 0.01). However, we find no evidence that GAAP or Form 5500 pension expense is differentially associated with market value.[22] In sum, the results in Table 4 suggest that Form 5500 information, particularly the funded position, may be more relevant to investor pricing decisions relative to the GAAP funded position consistent with tax accounting for the balance sheet containing measurement advantages over GAAP as it relates to pensions. Given that Form 5500 omits certain foreign and multiemployer pension plans that are not covered by ERISA, these findings are even more powerful.

We next investigate further why Form 5500 may be more value relevant to investors than

[22] While it may seem counter-intuitive to find a positive association between an expense component of earnings and market value, this finding is consistent with the well documented "service cost anomaly," first documented by Barth, Beaver, and Landsman (1992). Research suggests that the service cost anomaly exists because service cost proxies for value created by human capital.

comparable GAAP financial statement amounts. Table 5 presents the results of the simultaneous estimation of equations (4) and (5), which allows us evaluate the ability of corresponding GAAP and Form 5500 pension information to predict year-ahead cash contributions to the pension fund. After controlling for management's forecasted cash contributions, we find that both current year GAAP and Form 5500 funded positions are incrementally useful in predicting year-ahead contributions (i.e., better funded plans experience lower year-ahead cash contributions). We find no difference in the magnitude of these coefficient estimates across equations. We also find that both current year GAAP and Form 5500 expenses are positively associated with cash contributions as expected (i.e., higher expense results in higher cash contributions). However, we find that the association between Form 5500 expense and cash contributions is significantly stronger than the association between GAAP expense and cash contributions (p-value < 0.001). This result suggests that the current year pension expense on Form 5500 is more useful in predicting year-ahead pension contributions, relative to the GAAP pension expense.

4.4 Usefulness of unique Form 5500 information

Our prior results suggest that investors benefit from Form 5500 because it offers a different measurement perspective (i.e., tax accounting) than the same line items contained in the GAAP financial statements, in answer to RQ1. We next examine whether Form 5500 contains brand new value-relevant information that investors could not obtain through GAAP financial statements (i.e., RQ2). Specifically, we examine whether the break out of the Form 5500 liability into the portions due to current, retired, and terminated employees is useful to investors.

Table 6 presents the results of estimating equation (6). As in Table 3, we fail to find any statistical significance in the period before Form 5500 disclosure. However, within five minutes of Form 5500 disclosure we find a negative and significant coefficient estimate for the portion of

the liability owed to retired employees, consistent with investors viewing this portion of the liability negatively. We also show that the coefficients on the portion of the liability attributable to terminated and current employees becomes statistically significant over time, but that the reaction to the liabilities due to retired and current employees are significantly different in the initial 15 minutes following disclosure (p-value < 0.1). This result provides some initial evidence that investors value these liabilities differently, or at least pay differential attention to this disaggregated liability information when it is initially presented.

To examine whether there are any long-term differences in the value implications of these different liability portions, we use a value-relevance framework (Equation 7) and present the results in Table 7.[23] As in Table 6, we find a negative and significant coefficient estimate for the portion of the liability owed to retired employees, consistent with investors viewing this portion of the liability negatively. We also find a negative but insignificant coefficient estimate for the portion of the liability attributable to terminated employees. However, we find a positive and significant coefficient estimate for the portion of the plan liability attributable to current employees, consistent with investors viewing this portion of the liability as an investment in valuable human capital (Barth et al. 1992).[24] Testing for differences in the coefficient estimates, we find that the current-employee portion of the liability is valued significantly differently than the portion of the liability attributable to both retired and terminated employees (p-value < 0.01

[23] Because our focus is on liability disaggregation, we do not disaggregate GAAP pension expense. Oddly, when we do, we find that the service cost anomaly from Barth, Beaver, and Landsman (1992) persists among GAAP service cost even after controlling for the variables used in prior research (Hann, Heflin, and Subramanyam 2007; Yu 2013) to suppress the service cost anomaly.

[24] For example, pension plans can incentivize employees to work harder to improve long-term firm performance (Schnabel and Wagner 2001), particularly when monitoring employees is more difficult (Hutchens 1987). Pension plans can also reduce employee turnover and motivate skilled employees to delay retirement (Gustman, Mitchell, and Steinmeier 1994).

and < 0.05, respectively).[25]

The results in Tables 6 and 7 suggest that the market pays attention to the disaggregated pension liability information and prices the different components of a firm's pension liability differently. The most negative weight is applied to the portion of the liabilities owed to retired employees, which is likely attributable to the immediacy in which these liabilities must be settled. Further, we document a positive relation between market value and the portion of the plan liability attributable to current employees. This suggests that the service cost anomaly (i.e., the portion of the expense attributable to service cost proxies for value created by human capital; Barth et al. 1992), may also extend to the portion of the liability that represents benefits owed to current employees, while the liabilities owed to retired and terminated employees are valued similar to a traditional liability. Since GAAP does not require a similar disaggregation of the GAAP pension liability, investors are likely obtaining this information via the Form 5500. As such, there appears to be important information in the Form 5500 tax return that investors cannot obtain from GAAP financial statements, in answer to RQ2.

4.5 Supplemental Analyses

4.5.1 Implied cost of capital analysis

We show above that Form 5500 has greater value relevance than comparable GAAP pension information, and important information about the future pension-related cash flows. However, value can be affected by both information about cash flows or risk. To test whether Form 5500 information has additional risk-relevance over GAAP information, we replace market value

[25] The p-value for the difference between the coefficients on the portion of the liability attributable to current employees and terminated employees is only statistically significant at $p < 0.08$ when using one-tailed f-tests in the second column, where all control variables are included. We show results both with and without the control variables for the service cost anomaly, because it is not clear whether including these variables over-controls for unique variation that may be found in the pension liability for current employees. Intriguingly, we continue to find evidence of a service cost anomaly (i.e., a positive coefficient on the pension liability attributable to current employees) even after including these variables designed to control for this anomaly (Hann, Heflin, and Subramanyam 2007; Yu 2013).

in Equations (2) and (3) with the implied cost of equity capital. We calculate the implied cost of equity capital as the median of four common cost of capital measures, all as modified by Li and Mohanram (2014). Results of this analysis are reported in Table 8. We find that both the Form 5500 and GAAP funded positions are significantly associated with lower costs of equity capital, although the Form 5500 funded position is more risk-relevant (p-value < 0.1). We also find that the Form 5500 pension expense, but not the GAAP pension expense, is associated with a higher cost of equity capital, with a significant difference between the two expense coefficients (p-value < 0.1). In total, these results suggest that Form 5500 has greater risk-relevance to investor pricing decisions than comparable GAAP information.

4.5.2 MAP21

Pension accounting for tax purposes underwent a significant transformation with the enactment of MAP-21. This law allowed pension plans to replace a two-year average interest rate with a 25-year average interest rate in discounting pension liabilities to present value (IRS 2012). Given the historically low interest rates that existed at the time of this law's enactment, this law had the effect of significantly reducing required pension funding (Dambra 2018). However, this change in pension discounting also effectively led to pension accounting for tax purposes becoming significantly smoother, with the pension accounting for tax purposes reflecting more long-run historical trends and less current interest-rate innovations. Prior literature contains mixed evidence as to whether smoother earnings is consistent with higher- or lower-quality earnings (Tucker and Zarowin 2006; Jayaraman 2008; Dechow, Ge, and Schrand 2010; Demeré et al. 2019). Given both the mixed prior evidence on the value of smoothing, and the importance of the change to pension accounting enacted by MAP-21, we examine whether the usefulness of the Form 5500 changed with MAP-21. Table 9 presents the result of simultaneously estimating equations (2) and

(3) in the pre-MAP-21 and post-MAP-21 time periods, respectively.[26] In the pre-MAP-21 period, we find a positive association between both the GAAP and Form 5500 funded level and market value. However, we find no significant difference across the GAAP and Form 5500 equations in the association between market value and the two different measures of funded position.

Turning to the post-MAP-21 period, we again find a positive and significant association between both the GAAP and Form 5500 funded level and market value. However, the coefficient estimate for the GAAP net funded position decreased following MAP-21. Further, testing across the GAAP and Form 5500 equations, we now find a significant difference in the association between market value and the two different measures of funded position (p-value < 0.05). In sum, these results demonstrate that Form 5500 information is more strongly associated with market value relative to corresponding GAAP information particularly in the post-MAP-21 time period. Because MAP-21 resulted in greater smoothing of the pension liability for tax accounting relative to GAAP accounting, this result is consistent with other findings that suggest that smoothing in the tax setting is particularly informative (Demeré et al. 2019).

5. Conclusion

The long-standing debate over whether tax returns should be publicly disclosed is in need of empirical evidence to guide the debate (Lenter, Slemrod, and Shackelford 2003; Morris 2015; Hoopes, Robinson, and Slemrod 2018). Unfortunately, it is difficult to find settings where empirical evidence can be gathered (Demeré 2018). In this study, we examine the only public corporate tax return disclosure in the U.S. where specific information can be identified (i.e., Form 5500) to better inform this debate.

[26] Because we use lagged Form 5500 data to match Form 5500 pension expense with GAAP expense, we exclude the year 2012 from our MAP-21 analysis. Inclusion of the year 2012 would result in pre-MAP-21 data used to evaluate post-MAP-21 informativeness. Our results are qualitatively similar when including 2012.

Using FOIA data paired with intra-day returns, we find that investors react to the information contained in Form 5500 within five minutes of the information becoming public. We also examine why the Form 5500 is useful to investors, and find that (a) the tax accounting used in the Form 5500 is better associated with investor valuations and future pension contributions than comparable GAAP numbers and (b) there is unique value-relevant information in the Form 5500 that investors cannot obtain from other sources. Finally, we show that the increased smoothing of pension liabilities brought about through MAP-21 resulted in Form 5500 information becoming more valuable relative to GAAP information.

In sum, our study contributes to the tax return disclosure debate by showing that tax returns can be useful to investors and provides additional evidence regarding the information investors use to value firms with defined benefit pension plans. However, our results are subject to an important caveat. Although we do not have any theoretical reason to believe that pension information would be any different than other firm-specific tax return information, it is possible that our results in the pension setting will not externalize to non-pension tax returns. As such, further empirical evidence in other tax return disclosure settings is needed. We also contribute to the literature on pension information (e.g., Barth 1991) by showing that there is information in Form 5500 that is valuable to investors incremental to what is found in the financial statements. This evidence would suggest that it could be worthwhile for the FASB to consider whether changes should be made to pension reporting in the financial statements to make it more useful to investors. In particular, our results point to (a) allowing smoothing of the rate used to discount pension liabilities and (b) requiring disclosure of the components of the pension liability due to current, terminated, and retired employees being worth particular consideration.

Appendix A

Comparison of ERISA and GAAP rules

	ERISA	Comparison to GAAP
Present value of liability	Referred to as the "funding target." The discount rates used to estimate the funding target are published by the IRS. These rates are based on investment-grade corporate bonds. Form 5500 reports an estimate of the funding target as of the beginning of the plan year, which is usually January 1st for firms with a December 31st fiscal year end. For example, a Form 5500 corresponding to plan year 2015 would have a valuation date of January 1st, 2015.	Referred to as the "projected benefit obligation (PBO)." The discount rates used to estimate the PBO are based on high-quality corporate bond rates as of the end of the fiscal year. Form 10-K reports an estimate of the PBO as of the end of the fiscal year.
Net Liability	Referred to as the "funding shortfall." Calculated as the excess of the plan's "funding target" (i.e., present value of liability) over the plan's assets (also valued as of the beginning of the plan year).	Referred to as the "net pension liability." This amount must be recognized on a firm's balance sheet. Calculated as the excess of the PBO over the plan assets as of the end of the fiscal year.
Current year cost (expense)	Referred to as the "target normal cost." Equal to the present value of pension liabilities expected to accrue during the plan year, including increases in past service benefits attributable to current year increases in compensation.	Referred to as the "net periodic pension cost (NPPC)." Calculated as (+/- represent increases/decreases to NPPC): 1. + service cost (present value of benefits earned this year) 2. + interest cost (increase in the PBO attributable to the passage of time) 3. - expected return on plan assets 4. +/- amortization of actuarial losses/gains 5. +/- amortization of increases/decreases in prior service costs Service cost represents the present value of the benefits earned that year. Interest cost represents the increase in the present value of the liability attributable to the passage of time. Expected return on plan assets is included as a reduction to NPPC. Any differences between expected and actual returns as well as changes in the PBO due to changes in actuarial assumptions (primarily the discount rate) are sent to OCI in the current year and amortized through NPPC [via (4)] in future years. Any changes in prior service costs that arose during the year are included in OCI and amortized through NPPC [via (5)] in future years. Thus, "target normal cost" is essentially equal to (1) + the effect of prior service costs that arose during the year (under GAAP these costs are included in OCI in the year they arise and amortized through earnings [via (5)] in future periods). However, "target normal cost" excludes (2)-(5). Under ERISA changes in the present value of the liability and returns on assets simply affect the "funding shortfall" (i.e., the net pension liability), but do not impact the current year cost.

Appendix B
Variable Descriptions

TAQ Analysis Variables

5500_FundedRatio	= Form 5500 liabilities divided by Form 5500 assets
5500_ExpenseRatio	= Form 5500 expense ("target normal cost") divided by Form 5500 assets
5500_CurrentRatio	= Form 5500 liabilities owed to current plan participants divided by Form 5500 assets
5500_RetiredRatio	= Form 5500 liabilities owed to retired plan participants divided by Form 5500 assets
5500_TerminatedRatio	= Form 5500 liabilities owed to terminated plan participants divided by Form 5500 assets
GAAP_FundedRatio	= GAAP pension liabilities divided by GAAP pension assets ("projected benefit obligation")
GAAP_ExpenseRatio	= GAAP pension expense ("net periodic pension cost") divided by GAAP pension assets ("projected benefit obligation")
SIZE	= the log of market value of equity
BTM	= book value of equity divided by market value of equity

Aggregated Analyses Variables

P	= fiscal-year end price per share
BVX	= book value net of the GAAP net pension asset/liability scaled by common shares outstanding
NIX	= net income net of the GAAP pension expense scaled by common shares outstanding
5500_NetFunded	= aggregated Form 5500 assets minus aggregated Form 5500 liabilities scaled by common shares outstanding
5500_Expense	= aggregated Form 5500 expense scaled by common shares outstanding
5500_Current	= the portion of the aggregated Form 5500 liability attributable to current employees scaled by common shares outstanding
5500_Retired	= the portion of the aggregated Form 5500 liability attributable to retired employees scaled by common shares outstanding
5500_Terminated	= the portion of the aggregated Form 5500 liability attributable to terminated employees scaled by common shares outstanding
GAAP_NetFunded	= net pension asset (liability) from a firm's financial statements scaled by common shares outstanding
GAAP_Assets	= pension assets from a firm's financial statements scaled by common shares outstanding
GAAP_Liabilities	= pension liabilities (projected benefit obligation) from a firm's financial statements scaled by common shares outstanding
GAAP_Expense	= net periodic pension cost from a firm's financial statements scaled by common shares outstanding
EMP	= number of employees
RD	= research and development expense scaled by common shares outstanding
SALES_GROWTH	= average sales growth over the previous three years
CC	= total cash contributions to the pension fund scaled by common shares outstanding
CC_Expected	= management's expectation of cash contributions scaled by common shares outstanding
EMP_CONT	= employee contributions to all pension plans during the year scaled by common shares outstanding

ICC_MED	= implied cost of equity capital, computed as the median of the four cost of equity capital measures from Gebhardt et al. (2001), Claus and Thomas (2001), Easton (2004), and Ohlson and Juettner-Nauroth (2005). All measures are computed as modified by Li and Mohanram (2014)

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Table 1

Sample Selection

Panel A: 5500/Compustat Sample	Observations	Firms
Matched Form 5500s to Compustat Identifier (EIN/GVKEY)	16,441	1,160
Inconsistent valuation dates across 5500s	(2,062)	(12)
Final 5500/Compustat sample	14,379	1,148
Panel B: TAQ (Plan-Specific) Sample	Observations	Firms
Final 5500/Compustat Sample	14,379	1,148
Not able to merge with TAC data	(7,718)	(318)
Missing or zero GAAP pension asset/liability/expense, fiscal-year end closing price, common shares outstanding, or total stockholders' equity	(151)	(9)
Missing or zero ERISA assets/liabilities/expense/cash contributions	(239)	(22)
Price < $1, market value < $1,000,000, or stockholders equity < $0	(242)	(20)
Duplicates (based on gvkey, ein, and pin)	(147)	0
Final TAQ Sample	5,882	779
Panel C: Aggregated 5500 (Firm-Specific) Sample	Observations	Firms
Final 5500/compustat sample	14,379	1,148
5500 valuation date more than one day different than fiscal year end	(2,637)	(225)
Aggregate 5500 data and reduce sample to one observation per firm-year	(5,419)	0
Firm-year observations	6,323	923
Drop if missing or zero GAAP pension asset/liability, GAAP expense, cash contributions, closing price, total assets, common shares outstanding	(718)	(87)
Drop if missing or zero ERISA assets/liabilities/expense/cash contributions	(1,462)	(54)
Drop if price < $1 or market value < $1,000,000	(77)	(2)
Aggregated 5500 Sample	4,066	780
Panel D: Annual Value Relevance (Firm-Specific) Sample	Observations	Firms
Aggregated 5500 Sample	4,066	780
Require one year of lagged 5500 data	(1,002)	(53)
Drop if missing controls (EMP, RD, or SALES_GROWTH)	(40)	(8)
Annual Value Relevance Sample	3,024	719
Panel E: Cash Contribution Prediction (Firm-Specific) Sample	Observations	Firms
Aggregated 5500 Sample	4,066	780
Require one year of lagged 5500 data	(776)	(86)
Drop if missing employee contributions	(69)	(14)
Require two years of lagged 5500 data	(1,410)	(124)
Cash Contribution Prediction Sample	1,811	556

Table 2

Descriptive Statistics

Panel A: TAQ (Plan-Specific) Sample

	N	Mean	Std. Dev.	Median
5500 _FundedRatio	5,882	1.01	0.18	1.00
5500_CurrentRatio	5,882	0.36	0.22	0.35
5500_RetiredRatio	5,882	0.45	0.24	0.44
5500_TerminatedRatio	5,882	0.19	0.14	0.16
5500_ExpenseRatio	5,882	0.03	0.03	0.02
GAAP_FundedRatio	5,882	1.37	0.28	1.33
GAAP_ExpenseRatio	5,882	0.05	0.05	0.04

Panel B: Aggregated 5500 (Firm-Specific) Sample

ERISA vs GAAP	N	Mean	Std. Dev.	Median
5500_%Funded	4,066	1.01	0.16	1.00
GAAP_%Funded	4,066	0.75	0.15	0.75
% Difference_Asset	4,066	0.26	0.31	0.11
% Difference_Liability	4,066	0.42	0.26	0.35
ERISA & GAAP Regression Variables				
5500_NetFunded	4,066	0.06	1.40	(0.00)
GAAP_NetFunded	4,066	(2.20)	3.31	(1.09)
5500_Expense	3,989	0.11	0.22	0.05
GAAP_Expense	4,066	0.27	0.45	0.13
Other Regression Variables				
P	4,066	35.73	29.56	28.83
CC	4,066	0.39	0.60	0.17
CC_EXPECTED	3,337	0.31	0.45	0.14
BVX	4,066	21.04	17.06	17.38
NIX	4,066	2.13	3.64	1.89
RD	4,066	0.44	0.92	0.00
EMP	4,013	26.43	49.35	7.73
SALES_GROWTH	4,053	0.03	0.12	0.02
EMP_CONT	3,977	0.01	0.02	0.00

Table 2 Panel A presents descriptive statistics for the TAQ (plan-specific) sample. Table 2 Panel B presents descriptive statistics for the aggregated 5500 (firm-specific) sample. 5500_%Funded (GAAP_%Funded) is calculated as aggregated Form 5500 plan assets (GAAP plan assets) divided by aggregated Form 5500 plan liabilities (GAAP plan liabilities). %Difference_Asset (%Difference_Liability) is calculated as the absolute value of the difference between GAAP plan assets (liabilities) and Form 5500 plan assets (liabilities), scaled by GAAP plan assets (liabilities). All other variables are defined in Appendix B.

Table 3

TAQ Regression Analyses

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	Return_Pre20$_{it}$	Return_Pre5$_{it}$	Return_Post5$_{it}$	Return_Post15$_{it}$	Return_Post30$_{it}$	Return_Post60$_{it}$
Independent Variables	Coefficient estimates (t-stat)					
5500_FundedRatio$_{jit}$	-0.000	0.000	-0.002*	-0.005***	-0.005***	-0.005***
	(-1.19)	*(0.32)*	*(-1.89)*	*(-2.64)*	*(-2.80)*	*(-2.67)*
GAAP_FundedRatio$_{jit}$	-0.000	-0.000	0.001	0.002	0.001	0.001
	(-0.92)	*(-0.46)*	*(1.25)*	*(1.55)*	*(1.31)*	*(0.86)*
5500_ExpenseRatio$_{jit}$	0.001	0.002	-0.032***	-0.027***	-0.027***	-0.024**
	(0.84)	*(1.57)*	*(-3.41)*	*(-2.67)*	*(-2.67)*	*(-2.27)*
GAAP_ExpenseRatio$_{jit}$	-0.002	-0.001	0.012**	0.012*	0.012*	0.015**
	(-1.61)	*(-1.06)*	*(2.09)*	*(1.84)*	*(1.74)*	*(2.08)*
Control Variables						
SIZE	0.000	0.000***	0.000**	0.000	-0.000	-0.000
	(1.09)	(3.16)	(2.83)	(0.42)	(-0.09)	(-0.79)
BTM	-0.000	0.000	-0.000	-0.001**	-0.002***	-0.002***
	(-1.57)	(0.89)	(-0.17)	(-2.53)	(-3.02)	(-3.13)
Industry & Year FE	Included	Included	Included	Included	Included	Included
Model Information						
Constant	0.001**	-0.000	0.002	0.007	0.009	0.012
N	5,882	5,882	5,882	5,882	5,882	5,882
R^2	0.058	0.053	0.102	0.061	0.058	0.057

Table 3 provides the results of estimating equation (1). The dependent variable in columns (1)-(6) are returns calculated over the following windows (in minutes) surrounding the release of a Form 5500: (-20,0), (-5,0), (0,+5), (0,+15), (0, +30), and (0,+60), respectively. Standard errors are robust to heteroscedasticity and clustered at the plan level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 4

Value Relevance Analysis

	P_{it}	
	GAAP	**5500**
Independent Variables	Coefficient (t-stat)	
BVX_{it}	0.707***	0.662***
	(11.93)	*(12.78)*
$NetFunded_{it}$ (GAAP or 5500)	0.836***	2.608***
	(2.78)	*(4.81)*
NIX_{it}	3.617***	3.487***
	(11.59)	*(11.67)*
$Expense_{it}$ (GAAP or 5500)	*3.043*	*0.217*
	(1.45)	*(0.04)*
RD_{it}	*4.027***	*3.339*
	(2.92)	*(2.68)*
EMP_{it}	*0.014*	*0.008*
	(0.82)	*(0.49)*
$SALES\_GROWTH_{it}$	*13.257***	*13.953***
	(3.14)	*(3.35)*
Constant	5.684***	7.547***
	(3.80)	*(5.18)*
Industry & Year Fixed Effects	Included	Included
N	3,024	3,024
R^2	0.654	0.663
Vuong Test (z-statistic)	-2.93***	
Coefficient comparisons	**Difference**	**Chi²**
$NetFunded_t$(GAAP) vs $Net\ Funded_t$(ERISA)	*-1.772****	*10.07*
$Expense_t$(GAAP) vs $Expense_t$(ERISA)	*2.826*	*0.39*

Table 4 provides the results of simultaneously estimating equations (2) and (3). NetFunded (Expense) is a placeholder for GAAP_NetFunded and 5500_NetFunded (GAAP_Expense and 5500_Expense) in the GAAP and Form 5500 models, respectively. Standard errors are robust to heteroscedasticity and clustered at the firm level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 5

Cash Contribution Analysis

	CC_{it}	
	GAAP	**5500**
Independent Variables	Coefficient (t-stat)	
$CC\_Expected_{i,t-1}$	0.660***	0.790***
	(11.19)	*(22.74)*
$Expense_{i,t-1}$ (GAAP or 5500)	0.093*	0.684***
	(1.66)	*(7.20)*
$NetFunded_{i,t-1}$ (GAAP or 5500)	-0.051***	-0.052***
	(-4.40)	*(-5.33)*
EMP_CONT_{it}	*2.266***	*2.661****
	(2.55)	*(3.20)*
Constant	0.019	0.053
	(0.56)	*(1.24)*
Industry & Year Fixed Effects	Included	Included
N	1,811	1,811
R^2	0.708	0.702
Vuong Test (z-statistic)	0.759	
Coefficient comparisons	**Difference**	**Chi^2**
$Expense_{i,t-1}$(GAAP) vs $Expense_{i,t-1}$(ERISA)	*-0.591****	*37.450*
$NetFunded_{i,t-1}$(GAAP) vs Net $Funded_{i,t-1}$(ERISA)	*0.001*	*0.01*

Table 5 provides the results of simultaneously estimating equations (5) and (6). NetFunded (Expense) is a placeholder for GAAP_NetFunded and 5500_NetFunded (GAAP_Expense and Aggregate_5500_Expense) in the GAAP and Form 5500 models, respectively. Standard errors are robust to heteroscedasticity and clustered at the firm level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 6

TAQ Regression Analyses with Disaggregated Form 5500 Liability

	(1) Return_Pre20$_{it}$	*(2)* Return_Pre5$_{it}$	*(3)* Return_Post5$_{it}$	*(4)* Return_Post15$_{it}$	*(5)* Return_Post30$_{it}$	*(6)* Return_Post60$_{it}$
Independent Variables	Coefficient estimates (*t-stat*)					
5500_CurrentRatio$_{jit}$	-0.000	0.000	-0.000	-0.003	-0.004**	-0.004*
	(-0.55)	*(0.67)*	*(-0.07)*	*(-1.40)*	*(-2.02)*	*(-1.86)*
5500_TerminatedRatio$_{jit}$	*0.000*	*0.000*	*-0.001*	*-0.004**	*-0.005***	*-0.005***
	(0.61)	*(0.81)*	*(-0.83)*	*(-1.78)*	*(-2.04)*	*(-2.23)*
5500_RetiredRatio$_{jit}$	*-0.000*	*0.000*	*-0.003***	*-0.005****	*-0.006****	*-0.006****
	(-1.36)	*(0.76)*	*(-2.53)*	*(-3.18)*	*(-3.25)*	*(-3.10)*
GAAP_FundedRatio$_{jit}$	-0.000	-0.000	0.001	0.002	0.001	0.001
	(-1.20)	*(-0.74)*	*(1.23)*	*(1.53)*	*(1.33)*	*(0.93)*
5500_ExpenseRatio$_{jit}$	0.001	0.002	-0.044***	-0.039***	-0.034**	-0.032**
	(0.41)	*(1.20)*	*(-3.47)*	*(-2.80)*	*(-2.43)*	*(-2.24)*
GAAP_ExpenseRatio$_{jit}$	-0.002	-0.001	0.012**	0.011*	0.011*	0.014**
	(-1.53)	*(-0.95)*	*(2.06)*	*(1.81)*	*(1.71)*	*(2.04)*
Control Variables						
SIZE	0.000	0.000***	0.000**	0.000	-0.000	-0.000
	(0.96)	(3.17)	(2.20)	(0.28)	(-0.14)	(-0.82)
BTM	-0.000*	0.000	-0.000	-0.001*	-0.002**	-0.002***
	(-1.66)	(0.84)	(-0.13)	(-1.75)	(-2.99)	(-3.08)
Industry & Year FE	Included	Included	Included	Included	Included	Included
Model Information						
Constant	0.001**	-0.000	0.002	0.007	0.010	0.012*
N	5,882	5,882	5,882	5,882	5,882	5,882
R^2	0.058	0.053	0.102	0.061	0.059	0.057
Test of Differences	Difference (*f-statistic*)					

Current vs. Terminated	-0.000	-0.000	0.001	0.001	0.001	0.001
	(1.32)	*(0.04)*	*(0.61)*	*(0.46)*	*(0.08)*	*(0.49)*
Current vs. Retired	0.000	0.000	0.003**	0.003*	0.001	0.002
	(0.52)	*(0.00)*	*(5.23)*	*(3.73)*	*(1.10)*	*(1.20)*
Terminated vs. Retired	0.001*	0.000	0.002	0.001	0.001	0.000
	(3.03)	*(0.05)*	*(1.60)*	*(0.73)*	*(0.29)*	*(0.04)*

Table 6 provides the results of estimating equation (1). The dependent variable in columns (1)-(6) are returns calculated over the following windows (in minutes) surrounding the release of a Form 5500: (-20,0), (-5,0), (0,+5), (0,+15), (0, +30), and (0,+60), respectively. Standard errors are robust to heteroscedasticity and clustered at the plan level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 7

Value Relevance Analysis with Disaggregated Form 5500 Liability

	P_{it}	
Independent Variables	Coefficient (t-stat)	
BVX_{it}	0.655***	0.655***
	(11.19)	*(11.74)*
$GAAP\_Assets_{it}$	0.180	0.112
	(1.47)	*(0.96)*
$5500\_Current_{it}$	*1.410***	*1.188***
	(2.96)	*(2.69)*
$5500\_Retired_{it}$	*-0.440***	*-0.482**
	(-2.08)	*(-1.86)*
$5500\_Terminated_{it}$	*-0.686*	*-0.312*
	(-0.75)	*(-0.35)*
NIX_{it}	3.610***	3.584***
	(10.83)	*(11.58)*
$GAAP\_Expense_{it}$	*-1.829*	*-3.439**
	(-0.78)	*(-1.71)*
RD_{it}		*3.361****
		(2.60)
EMP_{it}		*0.011*
		(0.68)
$SALES\_GROWTH_{it}$		*14.982****
		(3.41)
Constant	5.996***	7.416
	(4.36)	*(4.84)*
Model Information		
Industry & Year Fixed Effects	Included	Included
N	3,024	3,024
R^2	0.646	0.656

Coefficient comparisons	**Difference**	**f-stat**	**Difference**	**f-stat**
Current vs. Retired	*1.85****	*11.93*	*1.67****	*8.66*
Current vs. Terminated	*2.10***	*3.930*	*1.50*	*2.11*
Retired vs. Terminated	*1.13*	*0.06*	*-0.79*	*0.03*

Table 7 provides the results of estimating equation (4). Standard errors are robust to heteroscedasticity and clustered at the firm level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 8

Implied Cost of Capital Analysis

	ICC_MED_{it}	
	GAAP	**5500**
Independent Variables	Coefficient (t-stat)	
$BVX_{i,t-1}$	-0.0003***	-0.0003***
	(-3.00)	*(-2.55)*
$NetFunded_{i,t-1}$ (GAAP or 5500)	-0.0014**	-0.0031***
	(-2.46)	*(-3.40)*
$NIX_{i,t-1}$	-0.0010**	-0.0009**
	(-2.16)	*(-1.98)*
$Expense_{i,t-1}$ (GAAP or 5500)	*0.0044*	*0.0197***
	(1.02)	*(2.02)*
RD_{it}	*-0.0044****	*-0.0031*
	(-2.86)	*(-2.39)*
EMP_{it}	*-0.0001****	*-0.0001****
	(-4.55)	*(-4.17)*
$SALES\_GROWTH_{it}$	*-0.0051*	*-0.0067*
	(-0.65)	*(-0.84)*
Constant	0.0733***	0.0736***
	(5.73)	*(5.84)*
Industry & Year Fixed Effects	Included	Included
N	1,935	1,935
R^2	0.149	0.147
Vuong Test (z-statistic)	0.451	
Coefficient comparisons	**Difference**	**Chi^2**
$NetFunded_{i,t-1}$(GAAP) vs Net $Funded_{i,t-1}$(ERISA)	*0.0017**	*2.67*
$Expense_{i,t-1}$(GAAP) vs $Expense_{i,t-1}$(ERISA)	*-0.0153**	*3.18*

Table 8 provides the results of simultaneously estimating equations (2) and (3). NetFunded (Expense) is a placeholder for GAAP_NetFunded and 5500_NetFunded (GAAP_Expense and 5500_Expense) in the GAAP and Form 5500 models, respectively. Standard errors are robust to heteroscedasticity and clustered at the firm level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Table 9

MAP-21 Value Relevance Analysis

	Pre-MAP21		*Post-MAP21*	
			P_{it}	
	GAAP	**5500**	**GAAP**	**5500**
Independent Variable	Coefficient (t-stat)		Coefficient (t-stat)	
BVX_{it}	0.705***	0.653***	0.723***	0.658***
	(10.42)	*(10.15)*	*(10.06)*	*(10.20)*
$NetFunded_{it}$ (GAAP or 5500)	1.470***	2.550***	0.569*	2.296**
	(3.58)	*(3.76)*	*(1.67)*	*(2.56)*
NIX_{it}	3.434***	3.377***	3.985***	3.842***
	(7.32)	*(7.18)*	*(10.47)*	*(10.51)*
$Expense_{it}$ (GAAP or 5500)	1.784	0.833	3.012	2.612
	(0.58)	*(0.10)*	*(1.42)*	*(0.44)*
RD_{it}	*3.525***	*2.302**	*5.363****	*4.724****
	(2.50)	*(1.88)*	*(3.16)*	*(3.00)*
EMP_{it}	*0.019*	*0.013*	*0.012*	*0.009*
	(1.23)	*(0.80)*	*(0.56)*	*(0.44)*
$SALES\_GROWTH_{it}$	*14.496***	*14.358***	*17.593***	*19.897****
	(2.29)	*(2.32)*	*(2.54)*	*(2.88)*
Constant	2.696	2.765	14.698***	15.130***
	(1.03)	*(1.13)*	*(5.77)*	*(6.59)*
Industry & Year FE	Included	Included	Included	Included
N	1,155	1,155	1,339	1,339
R^2	0.653	0.652	0.686	0.695
Vuong Test (z-statistic)	0.098		-1.88*	
Coefficient comparisons	**Difference**	**Chi²**	**Difference**	**Chi²**
$NetFunded_{it}$(GAAP) vs Net $Funded_{it}$(ERISA)	*-1.080*	*1.730*	*-1.727***	*4.630*
$Expense_{it}$(GAAP) vs $Expense_{it}$(ERISA)	*0.951*	*0.020*	*0.409*	*0.010*

Table 9 Columns provide the results of simultaneously estimating equations (2) and (3) in the pre- and post-MAP-21 time period. Standard errors are robust to heteroscedasticity and clustered at the firm level. ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively. All variables are defined in Appendix B.

Figure 1: Form 5500 Data Timeline