A demotion in disguise? The real effects of relocating pension smoothing from operating income to non-operating income

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July 2, 2023

Although operating income is a pervasively used performance metric, the FASB has never defined operating income. ASU 2017-07 moves toward defining operating income for the first time in the FASB's history by specifying the inclusion and exclusion of certain income components in operating income. We examine the real effects of a mandated relocation of the income-smoothing mechanisms for defined benefit pensions from "above the line" to "below the line" of operating income. For over 30 years, the income-smoothing mechanisms from SFAS 87 (1985) have created financial reporting incentives for employers to invest in higher-risk pension assets. Consistent with ASU 2017-07 reducing the financial reporting incentives for risk-taking, we predict and find that a sample of US firms subject to this mandate reduces investment in riskier pension assets following the change, relative to a control sample of Canadian firms not subject to the change. In cross-sectional tests, we find that the reduction in risk-taking is more pronounced in (1) firms where the financial reporting benefits to risk-taking were stronger in the pre-period, and (2) firms where the regulatory change particularly reduced those financial reporting benefits. Our findings provide the first direct evidence that smoothing induces US pension sponsors to tilt toward riskier pension investments; they also indicate that financial statement *presentation* has real economic consequences.

Keywords: Accounting regulation, standard-setting, defined benefit pension, operating income, Accounting Standards Update No. 2017-07
JEL Codes: M40, M41, M48

*Corresponding author. We are grateful for feedback from Shengnan Li (discussant), Jim Naughton, seminar participants at George Washington University, LSE, Syracuse University, and the University of California-Irvine, and conference participants at the Hawaii Accounting Research Conference. Prateek Kansal and Arya Farazdaghi provided excellent research assistance. Comments are welcome. All errors are our own.

I. INTRODUCTION

We examine the real effects of a mandated relocation of certain income components from "above the line" to "below the line" of operating income. Operating income is a pervasively used performance metric; most companies report it (or a similar subtotal) on the face of the income statement, and analysts and investors use it to assess corporate performance (PricewaterhouseCoopers 2007, CFA Institute 2016). And yet, "operating income" has no formal definition in US Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards (IFRS). Despite long-standing requests from financial statement users for formal guidance,[1] attempts to create a framework for classifying items into "operating" and "non-operating" have been stymied by the intrinsic complexity of that task. A recent move from the Financial Accounting Standards Board (FASB) is unusual when viewed against this background, in that it moves toward defining operating income—albeit implicitly and indirectly. Moreover, it does so within a topic that is controversial in its own right: pension accounting.

Pension expense consists of various components (service cost, interest cost, the expected return on pension assets, amortization of actuarial gains/losses and prior service cost), all of which have historically been disclosed separately in the pension footnote, but aggregated to pension expense and included as part of operating income, until a recent change by the FASB. Accounting Standards Update 2017-07 (hereafter, ASU 2017-07)[2] requires employers to present the service cost component separately from all the other (i.e., non-service cost

[1] In response to the FASB's Agenda Consultation (2016), PricewaterhouseCoopers wrote that reassessing the performance reporting model should be the Board's top priority, as that model is "critical to the continued relevance of GAAP… challenged of late by the proliferation of non-GAAP measures." Jack Ciesielski argued that the income statement is "undeniably useful to investors yet has never received much comprehensive attention. A logical format consistently presented among companies would aid investors in making intercompany comparisons, yet there's never been a presentation standard addressing the matter." The CFA Institute wrote that "standard-setters should define more income statement sub-totals", e.g., operating income, EBIT, and EBITDA.

[2] Accounting Standards Update 2017-07 *Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost* (FASB 2017).

components of pension expense). The ASU then goes a step further and requires employers to present the non-service cost components *outside operating income*.

Of particular interest to us is the mandated relocation of the expected return component of pension expense, measured as the fair value of pension assets multiplied by a long-term expected rate of return (ERR) assumption chosen by managers. Ever since SFAS 87 (1985)[3] introduced the ERR as a mechanism allowing firms to "smooth" pension expense so as to avoid recognizing the actual returns to pension assets (which are more volatile) in net income, managers have had the ability to boost reported income by assuming a higher ERR.[4] Critics argue that ERR-based smoothing biases pension portfolios towards riskier investments, which help to justify a higher ERR; employers can then reap the income statement benefits of that higher ERR (reduced pension expense and higher reported income) *without* bearing the costs of any higher volatility in income.[5] Thus far, academic studies provide indirect evidence of this "real effect" to ERR-based pension expense (Bergstresser, Desai, and Rauh 2006, Chuk 2013; Anantharaman and Chuk 2018).

Operationally, the real effect that we examine is whether firms sponsoring defined benefit (DB) pensions reduce the riskiness of their pension assets after ASU 2017-07's mandated relocation of smoothing mechanisms. We posit that ASU 2017-07 has the potential to dampen the financial reporting incentives to tilt towards riskier investments, because the expected return no longer flows into operating income (i.e., it moves from "above the line" to "below the line" of operating income). In other words, we posit that the smoothing mechanisms do not merely migrate from operating income to non-operating income, but rather are

[3] Statement of Financial Accounting Standards (SFAS) No: 87 *Employers' Accounting for Pensions,* Dec 1985.
[4] Warren Buffet famously quipped: "What is no puzzle…is why CEOs opt for a high investment assumption. It lets them report higher earnings. And if they are wrong, as I believe they are, the chickens won't come home to roost until long after they retire." Available at: https://www.berkshirehathaway.com/letters/2007ltr.pdf
[5] Gold (2005), in an influential piece "Accounting/Actuarial Bias Enables Equity Investment by Defined Benefit Pension Plans" summarizes the income statement benefits of the ERR model thus: CFOs "enjoy the benefit of the equity premium while avoiding much of the concomitant risk". Frieman et al. (2005), describes smoothing as an "opaque method of accounting that highlights the rewards of equity but obscures its risks".

metaphorically demoted down the income statement. Hence, any risk premium in the ERR arising from higher investment in risky assets could become less visible and less salient – as it only benefits net income but no longer benefits operating income. We predict that the ASU reduces managers' reporting-based incentives to invest in riskier assets, leading to some "unwinding" of pension risk.

ASU 2017-07 relocates all non-service cost components of pension expense to outside the subtotal of income from operations (if such a subtotal is presented), under the stated reason that these components are closer to investing or financing activities than to operating activities (ASU 2017-07, Paragraph BC20). Interestingly, SFAS 87 foreshadowed this eventual presentation change by acknowledging that "the return on plan assets and interest cost components are in substance financial items rather than employee compensation costs" (SFAS 87, Paragraph 16). Under ASU 2017-07, the service cost is the only pension expense component that remains in operating income, as it exclusively originates from employee services rendered in the current period (ASU 2017-07, Paragraph BC9).[6] Note that the ASU does not mandate any pension amounts to be presented as separate line items on the face of the income statement – that remains the issuer's decision based on the materiality of the amounts.[7] Rather, it forces pension expense components to be separated across operating and non-operating sections of the income statement.

To illustrate the ASU's change with a stylized numeric example, suppose a firm reports $35 for service cost, $120 for expected return, and $130 in cost for all other pension

[6] Service cost is defined as the expense caused by the increase in the pension benefits payable (i.e., the projected benefit obligation) to employees from services rendered during the period. Actuaries compute service cost as the present value of new benefits earned by employees in the period (Kieso, Weygandt, and Warfield, Chapter 20).

[7] Neither SFAS 87 nor subsequent pension standards explicitly specify whether net periodic pension expense is to be presented as a separate line item or not on the face of the income statement. Libby and Emmett (2014) note that guidance on income statement presentation is light for most topics, with the SEC's Regulation S-X implying that a split into COGS versus SG&A expense is all that is necessary, and little further guidance from specific accounting standards. As a result, many US firms only separate out these basic line items on the income statement, with varying levels of voluntary disclosure on what costs they enfold. Reviewing 10-Ks for the ten largest pension sponsors in our sample pre-ASU 2017-07, we note that pension expense is typically included within COGS and SG&A, and at times within R&D expense.

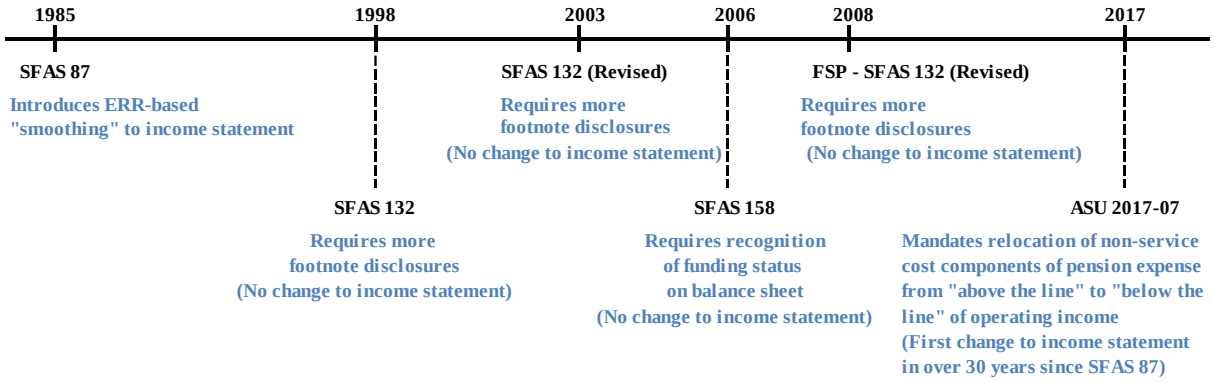
components.[8] Prior to ASU 2017-07, operating income would include a total "net" pension expense of $35 + $130 - $120 = $45 (typically within COGS and SG&A expense). After ASU 2017-07, operating income will only include the $35 service cost, with the remaining $10 expense (i.e., $130 - $120) now appearing below the line, in the non-operating section of the income statement. The ASU's changes have the potential to be economically significant to large pension sponsors; e.g., Ford Motor Company (an early adopter) disclosed in its 2017 10-K that on applying ASU 2017-07, SG&A expense was lower by $1.2 billion, and "other income" further down on the income statement decreased commensurately. A survey of Fortune 100 firms revealed an average 7% increase to 2017 operating income for early adopters, and a 5% expected average increase to 2017 operating income for other firms if they were to apply the ASU's mandated relocation (PricewaterhouseCoopers 2018).

One could argue that ASU 2017-07 mandates a change in the *measurement* of operating income by excluding some components that were previously part of operating income. However, it is crucial to note here that operating income is essentially a non-GAAP construct, having never been formally defined or required by US GAAP. As a result, the relocation of certain components out of operating income cannot be characterized as "measurement" (which would, by definition, only apply to GAAP constructs). Rather, it becomes a matter of income statement *presentation*, which refers to "the display of line items, totals, and subtotals on the financial statement" (FASB Statement of Financial Accounting Concepts No. 8, Chapter 7 *Presentation*, 2021). To that point, ASU 2017-07 is titled "*Improving the Presentation of Net*

[8] These stylized numbers are loosely based on average annual values of pension cost components for all US firms on Compustat in our pre-period: $34.5 million for service cost, $77.3 million for interest cost, $119.8 million for expected return, and $43.3 million (cost) for all other components. The expected return is economically significant – for the average US firm on Compustat prior to ASU 2017-07, the annual expected return is three and a half times as large as the service cost, and 77% of the sum of all non-expected return components.

Periodic Pension Cost and Net Periodic Postretirement Benefit Cost" (underlined emphasis added).[9]

Our study is motivated not only by the economic significance of the ASU's impacts on income statements of pension sponsors, but also by the marked departure that it represents for standard-setting, on pensions specifically and on income statement presentation more broadly. Within pensions, ASU 2017-07 represents the first change in over 30 years to pension accounting on the income statement since SFAS 87 (1985), which introduced smoothed pension expense as a concession to sponsors' protests on recognizing (volatile) actual returns on pension assets in earnings. That this controversial smoothing practice has endured is even more striking given that the FASB itself had initially characterized it as "transitional" (SFAS 87, Paragraph 5). The timeline below, which summarizes standard-setting for pension accounting under US GAAP, highlights why ASU 2017-07 is so atypical:



On moving beyond pensions to the broader context of financial statement presentation, ASU 2017-07 is important for a different set of reasons. A "multi-step income statement" that provides operating income as a subtotal is a standard practice in accounting textbooks,[10] but with the surprising twist that "current GAAP has no definition of operating income or lacks guidelines on what should be included in operating income" (ASU 2017-07, Paragraph BC21).

[9] In the FASB's own language throughout ASU 2017-07, the standard alters the presentation of pension expense on the employer's income statement, with only the subsection "Other Presentation Matters – Classification" amended in the codification. The measurement of that expense, on the other hand, remains unchanged.
[10] For example, Keiso, Weygandt, and Warfield, 17th edition, Chapter 4.

Hence, in response to the Exposure Draft for ASU 2017-07, some comment letter respondents opposed the "prescriptive" approach of the ASU, which they argued would implicitly be defining operating income by mandating the inclusion or exclusion of certain income components as part of operating income, and instead they "suggested that the Board defer changes to the presentation of the net benefit cost until it defines operating income or decides on performance statement presentation" (ASU 2017-07, Paragraph BC21). Therefore, in studying ASU 2017-07, we are also studying a FASB move that is construed by many as setting the stage for defining operating income.

We conduct empirical analysis on a sample of US DB sponsors, which are subject to the ASU, contrasted with a control sample of Canadian DB sponsors, which report under IFRS and are hence not subject to the ASU. Using a difference-in-difference research design and entropy balancing, we find that equity allocations in affected US firms' pension portfolios decline significantly after the ASU, relative to Canadian firms.

To attribute the effects more confidently to the ASU's reduction of financial reporting benefits from a higher ERR, we motivate cross-sectional tests along two dimensions: (1) firms for which the financial reporting benefits of risk-taking, as induced by the ERR-based expensing model, were stronger in the first place (pre-ASU); and (2) firms for which the ASU's relocation of expected return out of operating income reduced those financial reporting benefits more substantially. We expect larger reductions in pension risk-taking post-ASU for these groups of firms, and find strong, consistent evidence from both sets of partitions. In subsamples within which we expect the ASU to have a greater impact, US firms reduce equity allocations by about 2.5-4 percentage points more than Canadian firms. These shifts are economically significant, translating into 12%-18% of a standard deviation of equity allocation. Collectively, the cross-sectional tests help us to attribute the reduction in equity allocations to our proposed

mechanism: an unwinding of risky investments built up in the pre-ASU period to help justify a higher ERR, which would in turn boost reported operating income.

First, our study contributes to the literature on the real effects of accounting, which documents managers undertaking actions with cash flow consequences to report favorable accounting numbers. Much of this work documents real effects of accounting recognition and measurement in varied settings, with growing evidence on real effects of disclosure.[11] We extend this literature to the real effects of financial statement *presentation*. Our setting is uniquely geared to provide this evidence, as the ASU does not alter recognition, measurement, or disclosure; it exclusively targets presentation on the income statement.

Within the multidimensional construct of financial statement presentation, we focus on the location of display of line items in a financial statement. Settings where a line item that is already recognized on a financial statement is forcibly relocated, within the same statement, are few and far between. In studies examining such settings, Bartov and Mohanram (2014) and Luo, Shao, and Zhang (2018) focus on how mandated relocation of an item affects investor perceptions of that item, through outcomes such as value relevance, earnings response coefficients, and analyst forecast errors. The only other work we are aware of that examines the *real effects* of GAAP-mandated relocation is Cohen, Katz, Mutlu, and Sadka (2019), who document higher leverage in response to the relocation of minority interests from liabilities (or mezzanine) to shareholders' equity on the balance sheet. In contrast to Cohen at al. (2019), the mandated relocation that we study involves a subtotal (i.e., operating income) that is pervasively used but yet exists having never been formally defined by GAAP. Therefore, ex

[11] Studies documenting real effects of recognition and measurement include: R&D expensing (Horwitz and Kolodny 1981; Shevlin 1987), stock option expensing (Choudhary, Rajgopal, and Venkatachalam 2008; Hayes, Lemmon, and Qiu 2012); income tax expensing (Graham, Hanlon, and Shevlin 2011); derivatives recognition (Zhang 2009); consolidation (Bens and Monahan 2008); and retirement benefits (Mittelstaedt, Nichols, and Regier 1995; Amir, Guan, and Oswald 2010; Anantharaman and Chuk 2018). Studies documenting the real effects of disclosure include Chuk 2013; Naughton 2019; Bonaime 2015; Christensen, Floyd, Liu, and Maffett 2017.

ante it is not clear that their real effect findings, based on well-defined GAAP line items, can be generalized to our setting of operating income.

Second, while presentation has thus far received only "intermittent attention" from standard-setters (Libby and Emmett 2014), recent signs point to its increasing importance especially in the context of the income statement, within which our mandated relocation occurs: in its most recent Agenda Consultation (2021, p11), the FASB describes constituents as being interested in "creating a more uniform income statement presentation, such as through a requirement for a defined subtotal for operating income". Our findings have the potential to inform the nascent regulatory agenda on income statement presentation in multiple ways. The FASB's own statements, and user feedback, have often characterized (more) disclosure as a substitute for (improved) presentation on the income statement. For example:

> "Given the variety of industries and business models…it would be very challenging for the FASB to develop a definition of income from operations that could be broadly applied across industries. Rather than focusing on subtotals or categories of net income…it would be more effective to consider disaggregation of the components of income" (PricewaterhouseCoopers 2016a)

In our setting, pension expense components have long since been disaggregated in footnotes, and hence available to users desiring to develop their own performance measures. And yet, forcing the components to be separated across operating and non-operating sections of the income statement affects behavior; suggesting that in this setting, disclosure (in footnotes) is not a full substitute for presentation on the income statement.

While location is one aspect of financial statement presentation, any mandate that changes (any aspect of) presentation is uncommon to begin with. This relative rarity of standard-setting means that large-sample empirical evidence on the effects of presentation is scarce. Apart from the mandated relocation settings described above, the only other archival study we are aware of that examines a mandated change in presentation is Mohanram, Sun, Xin, and Zhu (2022), who exploit a Chinese mandate to disaggregate R&D expense on the face

of the income statement as opposed to folding it into other expense categories, such as SG&A.[12] By offering an isolated change to one aspect of presentation, ASU 2017-07 allows us to provide early evidence on the potential consequences of any larger overhaul of presentation that standard-setters may contemplate. If our results are any indication, a broader overhaul of income statement presentation, which is currently under consideration at the FASB (FASB Agenda Consultation 2021), is likely to have far-reaching economic consequences.

Third, relative to prior studies (Bergstresser, Desai, and Rauh 2006, Chuk 2013; Anantharaman and Chuk 2018), we provide the most direct evidence to date that smoothing pension expense on income statements induces a tilt towards higher-risk, higher-return investments such as equities in US sponsors' asset portfolios. To the extent to which (i) ASU 2017-07 softens the financial reporting incentive for risk-taking embedded in the smoothing model, and (ii) we observe a resulting reduction in pension risk, we can infer that the smoothing model created a tilt towards equities in the first place – empirically confirming a long-standing prediction of pension commentators.[13] However, our prediction is not without empirical tension, given that ASU 2017-07 removes the smoothing effects from operating income, but the smoothing effects remain in net income. Also, there are other strong arguments for why there may not be any tilt – primarily, that actual returns are disclosed in pension footnotes and recognized through other comprehensive income. Financial statement users, therefore, have long had the information necessary to adjust reported income by replacing expected with actual returns (Picconi 2006); and of any market, we would expect the US to have users sophisticated

[12] Experimental studies have examined other aspects of presentation (Libby and Emmett 2014 review this body of work).

[13] Prior evidence with US firms indicates that ERRs are tied to real asset allocations at least to some extent (Amir and Benartzi 1998, Bergstresser, Desai, and Rauh 2006, Chuk 2013), demonstrating a necessary condition for the tilt towards equities – if managers can get away with purely accrual-based inflation of the ERR estimate (without actually increasing allocations to higher-return asset classes), ERR-based accounting need not necessarily create a tilt towards equities. This evidence, however, is not sufficient to conclude that that the smoothing model creates a tilt towards equities; ultimately, that requires observing the counterfactual, namely, what asset allocations would have been in the absence of smoothing. ASU 2017-07 does not remove smoothing altogether but does lessen its place within the income statement, allowing us to get closer to that counterfactual.

enough to do so (as we note the US rating agencies already do). Evidence of a reporting-induced tilt towards equities is hence especially powerful in the US setting, where strong countervailing forces exist.

Having demonstrated that tilt in the US setting, its subsequent reduction with the ASU's presentation change also offers a fascinating counterpoint to earlier evidence, from IFRS firms, that pension risk-taking declined with IAS 19R's removal of the ERR from net income (Anantharaman and Chuk 2018). The reduction in risk-taking that we observe in the ASU setting is, strikingly, of the same order of magnitude as that documented in the IAS 19R setting. But the IASB's move tackles the relatively thorny issue of measurement in contrast to the FASB's focus on presentation; and yet, these very different regulatory shifts generate broadly comparable economic outcomes. Our findings highlight that financial statement presentation may be a more impactful standard-setting lever than generally recognized, as the FASB continues to consider the effects of presentation (FASB Agenda Consultation 2021).

Section II discusses the background and develops hypotheses. Section III describes our data and research design. Section IV reports empirical results. Section V concludes.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

The extant pension expense model

Ever since the issuance of SFAS 87 in 1985, pension expense on sponsoring firms' income statements has been composed of the core "operating" cost of pensions – the service cost (i.e., the cost of additional benefits earned by participants for one more year of service), and the interest cost (the cost of carrying the liability, arising from benefits' being discounted by one less year), offset by the returns earned on pension assets. Under SFAS 87's smoothed model of pension expense, service costs and interest costs are offset by expected (not actual)

returns on pension assets, computed as the fair value of pension assets multiplied by the ERR assumption.[14]

Real effects of the ERR-based pension expense model

The ERR assumption is left to managers' discretion, with FASB guidance that it must be based on the expected returns of the asset portfolio.[15] As higher-risk assets bring higher expected returns on average, shifting pension portfolios towards riskier assets can help to justify higher ERR assumptions, which in turn reduces pension expense and boosts reported net income. At the same time, the cost of investing in those riskier assets – namely, higher volatility in actual returns – is not reflected on the income statement. In a nutshell, the ERR-based accounting model does not symmetrically reflect the expected costs and benefits of risk-taking – it "highlights the rewards of equity but obscures the risks" (Frieman et al. 2005), and could hence tilt managers towards more risk-taking in pension portfolios than they would have undertaken otherwise.

Prior studies have documented evidence consistent with this purported effect. Within the ERR-based regime in the US, Bergstresser, Desai, and Rauh (2006) and Chuk (2013) provide evidence that managers seeking the income boost from a higher ERR also take the real actions of increasing risky asset allocations in their pension plans; this suggests that the pension portfolios of firms seeking an income boost are riskier than those of firms less motivated to

[14] The difference between expected and actual returns is a part of "actuarial gains and losses" (hereafter, AGLs), which are recognized in other comprehensive income (OCI), in essence a dirty-surplus item. These AGLs, which include not only differences between actual and expected return but also differences between actuals and estimates of other actuarial assumptions (discount rates, mortality rates, salary growth rates, etc.), can move in offsetting directions and are all recognized in the aggregate in OCI. If this pool of accumulated AGLs exceeds a threshold, or ''corridor''—currently 10 percent of the larger of the projected benefit obligation (PBO) and fair value of plan assets—it must then be amortized into net income (or ''recycled'') over the remaining average expected service life of beneficiaries. As a result, actual returns are recognized eventually in net income, but only through the recycling process, which usually occurs at a ''glacial'' pace, if at all (Picconi 2006), under US GAAP.

[15] SFAS 87, Paragraph 45: "The expected long-term rate of return on plan assets shall reflect the average rate of earnings expected on the funds invested or to be invested to provide for the benefits included in the projected benefit obligation. In estimating that rate, appropriate consideration should be given to the returns being earned by the plan assets in the fund and the rates of return expected to be available for reinvestment."

boost income. Anantharaman and Chuk (2018) provide more direct evidence informing on the removal of the ERR-based accounting model, investigating the IFRS shift that removed the ERR from net income. They predict, and find, that once the ERR assumption no longer affects reported net income under IAS 19R, the affected firms pull back on risky investments – suggesting that ERR-based accounting induced at least some portfolio tilt toward risk.

The removal of pension cost components from operating income under ASU 2017-07, and its potential real effects

With ASU 2017-07, the FASB has undertaken its first major change to pension accounting on the income statement since SFAS 87. While the ASU leaves the *measurement* of pension expense unchanged, it alters the *presentation* of pension expense on the income statement. It first requires pension expense to be disaggregated into service cost and all non-service cost components. Then, it requires service cost to be reported in the same line item as other compensation costs arising from services rendered by employees during the period; typically, these will include salaries and bonuses, and would be reported as an operating cost. All non-service cost components of pension expense – this includes interest costs, the expected return on pension assets, amortization of actuarial gains/losses and prior service costs, and other items such as net gains/losses on curtailments and settlements – are to be reported separately from service cost and *outside* operating income, if operating income is reported separately on the income statement. Importantly, no new information is disclosed: all pension expense components were already required to be individually disclosed on the pension footnote, per SFAS 87. Appendix A details the reporting changes mandated by ASU 2017-07.

Under the ASU, the ERR assumption continues to affect net income, but no longer affects *operating* income. Prior to the ASU, raising the ERR would boost both operating income and net income; after the ASU, raising the ERR boosts only net income while keeping operating income unchanged. As a result, ASU 2017-07 could reduce the financial reporting

benefits of inflating the expected return component, which (along with other components) is relegated from "above the line" of operating income to "below the line".

Does ASU 2017-07 reduce the financial reporting benefits of a higher ERR?

We predict that the financial reporting benefits of risk-taking have declined under the ASU, as a higher expected return no longer boosts operating income due to its relocation below the line, but only boosts net income. Underpinning this prediction is a key conceptual question about financial statement presentation and how it affects managers' and stakeholders' perceptions: do the financial reporting benefits from a higher ERR indeed decline, as its impact shifts out of operating income solely into net income? Only if these presentation changes reduce the financial reporting benefits of a higher expected return – and if managers believe that they do – would their incentives to tilt toward equities become lower, at the margin, when the expected return is relocated out of operating income.

Justifying our assumption that the ASU's changes reduce the financial reporting benefits of a higher expected return, is a stream of research on how investor perceptions are affected by the presentation – specifically, the location – of line items on the income statement. Generally, the closer an item is to the topline (sales revenues), the more permanent investors perceive it as, with correspondingly higher value-relevance (e.g., Lipe 1986, Bradshaw and Sloan 2002, Ertimur, Livnat, and Martikainen 2003, Fairfield et al. 1996, Ohlson and Penman 1992). Conversely, the lower down an item is on the income statement – the very direction in which the pension expected return has now moved – the more transitory investors perceive it as, with lower value-relevance. Moreover, managers respond to these distinctions by e.g., shifting expenses out of core earnings into (lower down) special items, implying that they are aware of the differential valuation implications of varying line-item location (McVay 2006; Lee, Petroni and Shen 2006; Curtis, McVay, and Whipple 2014; Gordon, Henry, Jorgensen, and Linthicum 2017).

Bartov and Mohanram (2014) get closest to clean inference on these implications in their study of SFAS 145, which moved gains/losses from early debt extinguishment out of extraordinary items, i.e., below-the-line of net income, to above-the-line of net income (before extraordinary items). They document that investors reacti more strongly to these gains/losses when they are reported above-the-line, consistent with higher-level placement of an income statement item increasing its value-relevance, even though the economic content of the item may be unchanged.

Furthermore, analysts and investors have increasingly focused on performance measures other than GAAP net income – variously labeled "core" / "proforma" / "operating" income or "Street" earnings; managers have increasingly provided such measures voluntarily (e.g., Bradshaw and Sloan 2002). Even the FASB warns against "focusing attention almost exclusively on 'the bottom line'".[16] The objective of such proforma measures calculated by analysts and managers, presumably, is to approximate a "core" earnings that better reflects sustainable, ongoing performance. The fact that these measures typically exclude non-recurring, presumably transitory items as well as other items considered "non-operating" suggests that operating income better approximates "core" earnings than does net income. The prevalence and value-relevance of such measures implies, at the minimum, that subtotals within net income that approach core earnings are incrementally useful to investors.

More specific to our setting, operating income itself has been shown to be a useful metric for investor decision-making. Barton, Hansen, and Pownall (2010) compare many summary measures of performance for 46 countries including the US – from sales revenues to operating income to net income to comprehensive income – and document that value-relevance peaks as one moves towards the middle of the income statement – to operating income and its

[16] "The individual items, subtotals, or other parts of a financial statement may often be more useful than the aggregate to those who make investment, credit, and similar decisions" (FASB Concept Statement No. 5, Paragraph 22).

variants. Operating income also matters for contracting – it is one of the most commonly-used performance metrics in CEO annual bonus contracts, along with net income and EPS (Ittner, Larcker, and Rajan 1997, Huang, Li, and Ng 2013).[17]

In sum, there are many reasons to believe that market participants and contracting parties regard operating income as a useful metric; managers, in turn, focus on the metrics that are widely used.[18] Hence, the desire to boost operating income – for valuation or contracting purposes – could have incentivized managers to increase risk in pension portfolios prior to the ASU. As those incentives no longer exist, some unwinding of pension risk could result.

In sum, to the extent that firms were investing in risky pension assets to garner financial reporting benefits prior to ASU 2017-07 (i.e., of justifying a higher ERR and boosting the expected return and hence operating income), those financial reporting benefits could be lower after ASU 2017-07. Thus, we predict some unwinding of those risky investments due to ASU 2017-07. Our main prediction follows:

H1: Firms affected by ASU 2017-07 will reduce risk-taking in pension asset allocations following the adoption of ASU 2017-07.

Empirical tension due to countervailing forces

Some key countervailing forces remain. First, unlike IAS 19R – which removes the effect of the ERR entirely from the income statement, under ASU 2017-07 the ERR continues to have the ability to boost *net* income. Notwithstanding the growing use of non-GAAP earnings measures, net income remains indisputably important in firm valuation and continues to be widely used in contracting. Therefore, it remains an open question whether the ASU's reduction of the financial reporting benefits of pension risk-taking are substantial enough to

[17] Guay, Kepler, and Tsui (2016) also document that CEO bonus plans typically incorporate multiple performance measures, with 1-2 earnings-based measures on average, ranging from net income to operating income to higher-level subtotals and scaled return-type measures. They do not provide statistics on the usage of each measure.

[18] A stream of research has documented evidence of earnings management in performance metrics that are widely used by stakeholders and—just as importantly—a lack of evidence of earnings management in performance metrics that are not widely used by stakeholders (Dechow, Richardson, and Tuna 2003; Jacob and Jorgensen 2007; Jorgensen, Lee, and Rock 2014; Burgstahler and Chuk 2015, 2017).

trigger unwinding of risky asset allocations, the expected-return effects of which can after all still flow into – and benefit – net income.

Second, pension expense has been disaggregated component-by-component in the pension footnote since SFAS 87, and even prior to ASU 2017-07 sophisticated financial statement users were computing proforma measures of pension cost by re-arranging and/or re-measuring certain pension cost components (Standard & Poor's 2003; Moody's 2006; Moody's 2016, ASU 2017-07, Paragraph BC12). When computing its own non-GAAP measure of pension cost, Standard & Poor's replaces the expected return with actual return on pension assets (Standard & Poor's 2003). [19] Moody's makes adjustments to "eliminate the effects of artificial smoothing of pension expense permitted by accounting standards" (Moody's 2006; Moody's 2016).[20] The FASB even acknowledges that the separation of service cost from other components is "highly supported by financial statement users and is consistent with the adjustment often made by some users in their analyses" (ASU 2017-07, Paragraph BC12); Rouen, So, and Wang (2021) report such adjustments by equity research firms. Viewing the ASU's mandated rearrangement of pension cost components as bringing GAAP in line with non-GAAP metrics already used in practice highlights another reason why this regulatory move is unusual: it represents a rare instance of the FASB voluntarily revising GAAP closer towards non-GAAP measures.[21]

The longstanding prevalence of non-GAAP substitutes for pension expense implies that for our setting, financial statement users have devoted time and resources to re-arranging

[19] If actual returns are positive, then actual returns reduce pension expense up to the amount of reported interest expense. If actual returns are negative, the full actual return is treated as an addition to pension expense.
[20] Moody's reverses all pension costs but adds back service cost; attributes interest expense to pension-related debt using an interest rate that represents a theoretical average borrowing cost for each issuer based on its credit rating; recognizes interest cost in other non-recurring income/expense; and adds or subtracts actual losses or gains on pension assets (up to the interest cost) in non-recurring other income/expense.
[21] Unsurprisingly, standard-setters have given preeminence to GAAP so far. E.g., SEC's Regulation S-K requires that non-GAAP measures cannot be displayed more prominently than the comparable GAAP measure. Furthermore, despite the widespread use of non-GAAP measures like EBIT and EBITDA, these measures have not yet found a place in GAAP.

GAAP pension expense, for the purpose of deriving an alternative (and presumably, superior) measure thereof. XBRL and other technologies that aid reconfiguration of financial statements make these adjustments even easier. If users in the pre-ASU regime were already stripping the benefits of a higher ERR out of operating income, and if managers correctly perceived that, then pre-ASU rules may not have created managerial incentives to tilt towards riskier assets in the first place and accordingly, the ASU 2017-07 mandate would not then reduce that tilt.[22]

Cross-sectional variation in ASU 2017-07's impact on risk-taking

We are more likely to observe results consistent with H1 for some types of firms, as the pre-ASU 2017-07 accounting rules need not have incentivized all firms to increase risk-taking similarly. Prior to ASU 2017-07, boosting the ERR was likely to have been more effective for some firms, relative to others, at boosting reported operating income. Hence, the risk-taking induced by the desire to boost operating income for these firms was also likely higher prior to ASU 2017-07. We expect that these firms experience a correspondingly greater "unwinding" of risky asset allocations post-ASU 2017-07. Accordingly, we exploit cross-sectional variation in how effectively the ERR could boost operating income to offer a further prediction:

> *H2: The reduction in risk-taking in pension assets after ASU 2017-07 will be more pronounced for firms for which inflating the ERR was more effective at increasing operating income prior to ASU 2017-07.*

By a similar logic, the ASU's unwinding of the financial reporting benefits of risk-taking could have been stronger for some firms than for others. To put it simply, if operating income really "mattered" to a firm pre-ASU (and managers perceived that correctly), then the ASU's relocation of expected return out of operating income likely reduced the financial reporting benefits of risk-taking more for that firm. Conversely, if operating income is not a

[22] While credit rating agencies are known to adjust reported pension expense by replacing expected returns with actual returns, Comprix and Muller (2006) provide evidence consistent with compensation committees *not* making a similar adjustment when determining CEO bonuses. Therefore, even if sophisticated investors back out expected returns from reported income when valuing the firm, it appears that higher expected returns can still boost income measures used in compensation contracting.

salient metric (for valuation or contracting) – because instead, say, net income is the dominant measure – then the ASU may not have substantially reduced the financial reporting benefits of risk-taking for that firm. We would expect a correspondingly greater unwinding of risk-taking for the former, rather than the latter, firm. Our third hypothesis follows:

H3: The reduction in risk-taking in pension assets after ASU 2017-07 will be more pronounced for firms for which the financial reporting benefits of risk-taking are reduced more by the ASU.

III. DATA AND EMPIRICAL MODEL

Constructing a treatment sample of US firms

Table 1 outlines the sample selection. We start by identifying all US firms with defined-benefit (DB) pensions that are represented in Compustat North America for the last fiscal year (FY) before ASU 2017-07 and the first FY under ASU 2017-07. As ASU 2017-07 became effective for fiscal years beginning after December 15, 2017, for December fiscal year-end (FYE) firms this translates into FY 2017 (pre-ASU) and 2018 (ASU) respectively. We obtain annual reports for these firms from the SEC website, yielding an initial sample of 1,328 firms.

We hand-collect detailed pension asset allocations, ERRs, and discount rates from annual reports for the two-year period extending from the last FY before adoption of ASU 2017-07 to the first FY post-adoption. We lose 498 firms due to missing data required for our model variables, and 80 firms that do not have sufficient data in both the pre- and post-periods. We remove four firms that are voluntary early adopters of the provisions in the ASU, given that changes in behavior for early adopters would likely have occurred prior to our time window. These steps lead to 746 firms and 1,492 firm-years for the US "treatment" sample.

Selecting a control sample of Canadian firms

To make reliable inferences about the effects of ASU 2017-07 and to rule out macroeconomic or over-time influences, we require a control sample of firms unaffected by ASU 2017-07. Lacking a natural control sample of unaffected pension sponsors within the US,

we draw on Canadian listed firms that sponsor DB pension plans. While cross-country research designs come with inevitable limitations, Canadian firms are well suited as a control sample for many reasons: (i) they are geographically proximate to US firms and share a similar capital markets environment (e.g., Leuz, Nanda, and Wysocki 2003); (ii) the pension regulatory framework across both countries, even if not identical, shares many fundamental features: DB pensions are required to be pre-funded; assets are held in trust but controlled by the sponsor; asset allocations are determined by the sponsor without explicit rules and limitations on asset classes;[23] (iii) pension sponsors in the US and Canada are at a broadly similar (and early) stage of their de-risking journey, in stark contrast to other regimes like the UK, where de-risking actions have become commonplace in past decades.[24]

Importantly, Canadian firms are presumably unaffected by ASU 2017-07, as they report under IFRS since 2013, and the measurement and presentation of pension expense components under IFRS underwent no alterations during our window of interest.[25] For all these reasons, we believe that Canadian firms offer an appropriate control sample to evaluate the treatment effects of ASU 2017-07. We use entropy balancing in estimating the effects of ASU 2017-07.

Relying on Compustat North America for financial and pension data on Canadian firms, we find 198 Canadian firms that sponsor DB pensions. We remove 19 Canadian firms that

[23] These similarities are better appreciated when considering other potential control samples, such as the UK and Europe, which differ fundamentally from the US in their regulatory framework (e.g., Glaum 2009). For example, German DB plans are not required to be pre-funded and hence many hold no assets in trust. UK plans are required to index benefits to inflation, whereas most corporate DB plans in the US do not (Breedon and Larcher 2021).

[24] "De-risking" is a term that has come to be used to describe a range of actions that sponsors can take to minimize or transfer (to other parties) the various risks associated with a DB plan (Society of Actuaries 2021), i.e., asset risk (the risk that market returns on investments will fluctuate), interest rate risk (which affects the valuation of the plan obligation as well as returns on fixed-income investments), and longevity risk (the risk that beneficiaries will live longer than expected, leaving the sponsor responsible for paying more benefits than planned). These actions include changing plan design (closing or freezing plans, hybrid benefit structures), "hibernating" plans by investing entirely in fixed-income securities that match benefit payout maturity, and settling the plan with an insurance company (transferring the liability and corresponding assets to settle the liability) or directly with beneficiaries through a lump-sum offer. Pension settlements were pervasive in the UK even pre-2010, while far less common in the US and Canada (Prudential Insurance 2012, Monk 2009).

[25] Under IAS 19R, there is no specific mandate as to where pension cost components should be presented on the balance sheet or even whether the components must be presented separately; firms are allowed to choose a presentation approach under the expectation that it is consistently applied.

choose to report under US GAAP instead of IFRS, as allowed by Canadian securities regulators (Burnett, Gordon, Jorgensen, and Linthicum 2015). We lose 49 firms lacking data for model variables and 10 firms lacking sufficient data in both periods. Our final sample of 120 Canadian firms translates to 240 firm-years for the Canadian control sample.

We obtain annual reports for these firms from Canada's online repository of public company filings, SEDAR, supplemented by hand-collection from company websites. We hand-collect detailed pension asset allocations, ERRs, and discount rates from Canadian annual reports for the same two-year period as for the treatment sample. We convert all numbers from CAD to USD using the exchange rate at the fiscal year-end.

Specification to test the consequences of ASU 2017-07

We identify the overall effect of ASU 2017-07 with a difference-in-differences (DD) specification, which compares pre- and post-ASU 2017-07 shifts in asset allocation of US firms affected by ASU 2017-07, to shifts over the same time in asset allocations of Canadian control firms. We employ the following OLS specification:

$$\%\text{EQUITY (or \%FIXED INCOME)} = \beta_0 + \beta_1\ \text{POST} + \beta_2\ \text{US} + \beta_3\ \text{POST*US} + \Sigma\ \text{Controls} + \text{FIRM FE} + \varepsilon \quad \text{(Equation 1)}$$

The dependent variable %EQUITY captures the proportion of pension assets invested in the (relatively risky) equity markets and is hand-collected from the detailed asset allocation disclosures on annual reports of US and Canadian sponsors. We estimate an alternative version of Eq. (1) with %FIXED INCOME – the proportion of pension assets invested in relatively safe assets, namely fixed-income securities and cash and cash equivalents. We hand-collect these allocations to better capture the richness and complexity of these disclosures, which are not fully reflected on Compustat Pensions.

US is a firm-level indicator set to one (zero) for US (Canadian) firms. POST is an indicator set to one for firm-years under ASU 2017-07, and to zero for firm-years ending before

the ASU became effective. Our variable of interest is the DD estimator on the interaction POST*US, which captures the incremental change in asset allocations of US pension plans, relative to Canadian plans.

Our control variables capture cross-sectional determinants of asset allocation, motivated by prior research. We control for sponsor size (Size) as larger sponsors have wider investment opportunities. Firms with tighter debt covenants or with a tradition of paying dividends have stronger incentives to minimize volatility in funded status and consequently in required contributions, to avoid breaching covenants or to preserve the cash flows needed to pay dividends. Accordingly, we control for closeness to covenant thresholds with leverage (Leverage), and for dividend-paying status (Dividends). Firms with volatile operating cash flows would also have an incentive to minimize volatility in required contributions, motivating cash flow volatility (SDCF) as a control variable. Black (1980) and Tepper (1981) argue that tax-paying firms have an incentive to borrow on the corporate balance sheet, fund plans, and invest plan assets in the most highly taxed securities – bonds.[26] This "tax arbitrage" argument suggests that high tax-paying firms invest more in bonds. We capture tax-paying status with an indicator variable set to one if the firm has net operating loss carryforwards (NOL).

Amongst plan-level characteristics, we control for funding ratio (Fund Ratio) and the square thereof (Fund Ratio^2), as prior research hypothesizes that very overfunded and very underfunded plans – in an attempt to minimize contribution volatility – tend to invest in bonds, while moderately funded plans increase equity investments to earn their way out of underfunding (Bader 1991, Amir and Benartzi 1999). We control for plan horizon (Horizon, measured as the natural logarithm of PBO/service cost), as longer-horizon plans (with younger beneficiaries) should invest more in equities to hedge against salary increases (Rauh 2009).

[26] This strategy helps to maximize shareholder value as sponsors can then deduct interest off the corporate tax return but accrue interest tax-free on the bonds held inside the pension trust.

Finally, not all sponsors rebalance allocations to target period-by-period; hence, equity investments can grow as a proportion of total plan assets in years when equity markets perform well. To control for passive growth in equity investments, we include the broad-based performance of global equity markets with the return on the S&P Global Broad Market Index for equities (Market Returns).[27] We also incorporate firm fixed effects and cluster standard errors at the firm level. Appendix B provides detailed variable definitions.

IV. EMPIRICAL RESULTS

Descriptive statistics of model variables for the US sample (treatment group)

Table 2, Panel A (Panel B) describes the US sample pre- (post-) ASU 2017-07. Equities and fixed income (including cash/cash equivalents) are the largest categories for US plans pre-ASU 2017-07, with mean (median) investment of 40.4% (43.2%) of pension assets in equities and 45% (42%) in fixed income. We observe a marked downward shift in %EQUITY after ASU 2017-07, to a mean (median) of 34.8% (36%). Notably, the entire distribution of %EQUITY shifts downwards – the 25th percentile declines from 25.3% to 16.8%, and the 75th percentile declines from 57.6% to 52%. Fixed income investment displays a corresponding upswing along the entire distribution – the mean (median) %FIXED INCOME increases to 50.4% (47.2%), with the 25th percentile increasing from 31.8% to 35.3%, and the 75th percentile increasing from 57% to 64.8%. Unsurprisingly, ERRs also decline from 6.2% (6.50%) to 5.97% (6.25%).

The market value of firm equity starts out at $14.9bn ($3.5bn) in the pre-period, dropping marginally to about $13.8bn ($2.9bn) in the post-period. Similarly, the fair value of plan assets, which is $1.7bn ($297.8m) in the pre-period, drops slightly to $1.6bn ($272.6m) in the post-period. Funding ratios, however, remain steady at 83.6% (84.2%) in the pre-period

[27] As a result of less-than-perfect rebalancing, in a year in which the equity markets perform well (poorly), equity allocations can grow (decline) for all sponsors. As our DD specification involves comparisons across time, overall equity market performance in each period hence needs to be controlled for.

and 83.2% (83.5%) in the post-period. Other fundamentals such as leverage, dividends, cash flow volatility, loss carryforwards, and plan horizon do not exhibit noteworthy trends across periods. Market returns are positive in the pre-period and negative in the post-period.

Descriptive statistics of model variables for the Canadian sample (control group)

Table 3, Panel A (Panel B) describes the Canadian sample pre- (post-) ASU 2017-07. %EQUITY has an interquartile range of 29%-58% in the pre-period (broadly similar to the US sample). The mean (median) of %EQUITY starts off slightly higher than the US, at 42.2% (45%), and drops to 38.7% (40.5%) post-ASU. %FIXED INCOME starts out at 46.5% (44.6%) – similar to the US sample, and increases to 49.1% (46.8%).[28]

Table 4 shows the correlation matrix of all the variables. As expected, %EQUITY and %FIXED INCOME are negatively correlated, and ERR% is positively (negatively) correlated with %EQUITY (%FIXED INCOME). Consistent with some inertia in rebalancing, equity Market Returns are positively associated with %EQUITY.

As equity market returns were generally negative in 2018 (the post-ASU year), the reduction in equity allocations across the board in US and Canada could be driven by broader market movements to some extent, especially if sponsors face constraints to actively rebalancing portfolios in each period. Importantly, the change in %EQUITY appears more negative for US firms, as we would expect. The common trends in asset allocations across US and Canada highlight the importance of our DD research design, where common macro-economic trends are differenced away. We discuss this specification next.

Coefficient Plots

We next assess whether our pre-treatment trends are parallel. In Figure 1, we plot the coefficients for the four years prior to treatment, where the coefficients are obtained from

[28] ERRs for the Canadian sample are much lower than ERRs for the US sample, with mean (median) of 4.3% (3.8%) pre-ASU and 4% (3.6%) post-ASU. As Canadian firms are subject to IAS 19R, their "ERRs" are defined differently from those of US firms – IAS 19R requires the ERR to be equal to the discount rate, which is determined from high-quality corporate bond yields matched to the duration of pension obligations.

regressing *%EQUITY* on separate binary variables coded as one for US firms in years t-1 to t-4, and coded as zero otherwise. The year t-5 acts as a baseline year. We include all the firm level controls along with firm fixed effects, similar to our main regression specification. The plotted coefficients represent the difference between *%EQUITY* for US firms and Canadian firms in that period as compared to the baseline year. None of the coefficients are significant. Consistent with parallel trends, we find that the coefficients are not increasing or decreasing in the pre-treatment period.

Difference-in-differences (DD) tests of the effect of ASU 2017-07

To more confidently draw inferences on the ASU's treatment effects, we implement multivariate matching across US and Canadian samples using entropy balancing. Like other multivariate matching approaches (e.g., propensity score matching), the goal of entropy balancing is to eliminate differences in covariates across treatment and control samples. Entropy balancing, however, has two conceptual advantages over propensity score matching (McMullin and Schonberger 2020): it ensures that higher-order moments of covariate distributions are nearly identical across treatment and control samples; and it does away with the many researcher choices that are necessary for propensity score matching and that can influence its results. McMullin and Schonberger (2020) highlight that entropy balancing has particular strengths in settings where the outcome variable is a non-linear function of the underlying controls – a feature applicable to our setting, where asset allocation is believed to be non-linearly affected by funding (Bader 1991, Amir and Benartzi 1999, Anantharaman and Lee 2014). Entropy balancing also offers the empirical advantage of allowing us to retain our full US and Canadian samples. We detail the entropy balancing procedure in Appendix C, with the pre- and post-balancing distributional properties summarized in Table C1. Table C1 shows very similar means for matching variables after entropy balancing.

In Table 5, we present results of estimating the DD specification of Equation (1) with US and Canadian firms, pre- and post-ASU 2017-07. We present results of Eq. (1) without (with) entropy balancing in Panel A (Panel B). Columns (1) and (3) [(2) and (4)] display specifications with %EQUITY [%FIXED INCOME] as the dependent variable. The POST indicator is strongly significant across Columns (1)-(4), indicating a drop in equity investment to the tune of 2.63%-2.86% post-ASU for all firms, and an accompanying increase in fixed income investment to the tune of 2.30%-2.54%. Importantly, our main coefficient of interest, US*POST, is negative and significant at the <0.05 (<0.01) level in %EQUITY specifications without (with) entropy balancing, while positive and significant at the <0.01 level in %FIXED INCOME specifications. The coefficients on US*POST indicate that after controlling for various determinants of asset allocation, US firms reduce equity allocations post-ASU by 1.76%-2.27% more than Canadian firms and increase fixed-income allocations by 2.45%-2.65% more than Canadian firms, on average. As US firms are affected by ASU 2017-07 whereas Canadian firms are presumably unaffected, this provides direct evidence consistent with H1 that ASU 2017-07 engenders risk reduction.

Cross-sectional variation in the financial reporting incentives for risk-taking

The DD design helps to a large extent in ruling out omitted variables concerns arising from permanent, time-invariant differences across US and Canada, or global macroeconomic trends and market movements affecting both countries. For our results to be explained by an omitted variable, the omitted variable would have to time-vary contemporaneously with ASU 2017-07 implementation *and* affect US and Canadian plans differently.

To further verify that US risk-reduction is attributable to ASU 2017-07, we examine cross-sectional partitions varying the expected strength of the ASU's effect. In the first set of partitions, we examine subsamples in which we expect the financial reporting benefits of risk-taking to have been more pronounced pre-ASU 2017-07. If the risk reduction observed in US

plans is truly attributable to our hypothesized mechanism, then we would expect it to be stronger for firms whose asset allocations were more influenced by reporting incentives to begin with (H2).

To test H2, we employ two proxies to operationalize the strength of reporting-based incentives to invest in risky assets pre-ASU 2017-07. Our first measure is the ratio of the expected return component to all other components of pension costs (Table 6). This captures sponsors for which the expected return is an economically significant component of pension expense and is hence more likely to offset the other (income-decreasing) pension cost components. We expect sponsors with more economically significant expected return components to have had stronger incentives, pre-ASU, to boost the ERR. Our second measure is the ratio of fair value of pension assets to operating income (Table 7); it captures how powerful the ERR is as a lever for boosting operating income (Bergstresser, Desai, and Rauh 2006). As the expected return component is calculated as *ERR*fair value of ending pension assets*, any increase in the ERR has a greater impact on operating income for a firm with large pension assets; the ratio of fair value of plan assets / operating income hence captures the extent of this multiplier effect. Sponsors with greater multipliers, we assume, have stronger incentives pre-ASU to boost the ERR.

In Tables 6 and 7, we partition the sample by median values of the proxies, creating a subsample with high incentives and a subsample with low incentives. We separately estimate Equation (1) for each of the two resulting subsamples, with Panel A (Panel B) presenting results for the subsample with high (low) incentives. Our subsamples display economically significant differences along the partitioning variables: median expected returns are 94.5% (54%) of other pension costs for the high (low) subsample; and median plan assets to operating income is 2.3 (0.4) for the high (low) subsample.

The results in Tables 6 and 7 indicate that the reduction in risk-taking is concentrated in firms with greater financial reporting benefits to holding risky pension assets prior to ASU 2017-07, consistent with H2. In Tables 6 and 7, the coefficient of interest US*POST is significant at the <0.01 level throughout in Panel A for the high incentive subsamples, whereas it is not significantly different from zero in Panel B, for the low incentive subsamples. Within the high-incentive subsample, the coefficients indicate an incremental reduction in US firms' equities to the tune of 3.98% and 2.50% compared to Canadian firms, in Tables 6 and 7 respectively. This translates into 18.3% and 11.5% respectively of one standard deviation in US %EQUITY from the pre-ASU period – indicating economically significant shifts.

Collectively, these results present a picture of stronger reductions in equity investment for the firms that had stronger incentives to boost the ERR – whose reporting-based incentives for risk-taking were stronger to begin with. As these types of firms likely had larger risky positions to unwind after ASU 2017-07, these cross-sectional patterns help us to isolate the ASU's reduction of reported-based incentives as a driving factor behind the results we observe.

Cross-sectional variation in the ASU's unwinding of the financial reporting incentives for risk-taking

In our second set of cross-sectional partitions, we focus on the strength of the ASU's purported effect, of reducing the financial reporting benefits of risk-taking. If the reduction in risk-taking is attributable to the ASU's shifting of expected return out of *operating income*, we would expect a larger effect for firms for which operating income was particularly important as a summary metric of performance – and for which the financial reporting benefits of a higher expected return (in that operating income) have hence declined more significantly.

We operationalize the importance of operating income as a summary metric for valuation with two proxies. First, we isolate firms for which at least one analyst (on the I/B/E/S database) issues an explicit forecast of operating income. Analyst focus on operating income is interesting for multiple reasons – it could indicate firms for which the operating income is

an intrinsically more useful summary performance measure relative to net income (for reasons associated with firm fundamentals, industry fundamentals, or firm reporting behavior).[29] Analysts' focus on operating income could also engender greater attention to that metric from other investors and market participants. Second, we directly examine the decision-usefulness of operating income, relative to net income, for equity investors' valuation. To gauge this, we estimate firm-specific regressions of price on operating income, and of price on net income, and partition firms by the ratio of the R^2s from these two models, which serves as our measure of the relative value-relevance of operating income versus net income.

We present results in Table 8 (analysts' forecasts of operating income) and Table 9 (value-relevance of operating income relative to net income). In Table 8, about 45% of our sample firm-years have at least one analyst forecast of operating income. In untabulated estimations for Table 9, we find that the R^2s from models of price on operating income are consistently higher than from models of price on net income – the mean R^2 from operating income (net income) models is 23.2% (14%) while the median R^2 is 15% (8.06%), with very similar statistics across US and Canadian samples. The median R^2 of operating income relative to net income is 5.2 for the high subsample, versus 0.6 for the low subsample.

The subsample results in Tables 8 and 9 are broadly consistent with our expectations: in both cases, the US*POST interaction is significant at least at the <0.05 level for the predicted subsample (with analysts' forecasts for operating income, and higher value-relevance of operating income), while insignificant for the other subsample. The coefficients indicate an incremental reduction in US firms' equities to the tune of 2.84% among firms with analysts' operating income forecasts, and 2.56% among firms with high value-relevance of operating

[29] Prior research on analyst forecasting decisions suggests that analysts respond to market participants' demand for value-relevant information when choosing to provide forecasts of additional summary metrics of firm performance (e.g., Brown and Sivakumar 2003, DeFond and Hung 2003).

income. These effects translate to 13.1% and 11.8% respectively of one standard deviation of US equities.

While analyst forecasting and value-relevance partitions capture the importance of operating income as a summary metric for valuation, we conduct a final test partitioning by the importance of operating income in contracting. The Incentive Lab dataset contains data on executive compensation, including information on which performance metrics are used in compensation contracts, such as revenue, ROA, ROE, EVA, or operating income. The dataset allows us to identify firms for which operating income is used as a performance metric for any component of an executive compensation contract, such as base salary, bonus, and stock grants. As these data are not available in machine-readable form for Canadian firms, we focus this cross-sectional test within US firms with Incentive Lab data available, presenting results in Table 10. Within US firms for which operating income explicitly features in compensation contracts of the CEO or CFO (Panel A), equity investment goes down by 7.44% between pre- and post-ASU periods (equivalent to one-third of one standard deviation of %EQUITY). In comparison, equity investment goes down by 3.34% for remaining firms (Panel B); chi-squared tests indicate that the reduction in Panel A is significantly larger than in Panel B. Collectively, these cross-sectional results provide further evidence helping to attribute the risk-reduction to ASU 2017-07's removal of expected return from operating income.

V. CONCLUSION

We examine an accounting rule change (ASU 2017-07) in the US that mandates that the expected return on pension assets (along with other non-service cost components of pension expense) be disaggregated from pension service cost and relocated out of operating income. Following ASU 2017-07, we document a reduction in affected US firms' investment in riskier pension assets, relative to a control sample of Canadian firms that report under IFRS and are hence unaffected by the mandate. We infer from this that pre-ASU financial statement

presentation – wherein expected returns flowed into *operating* income – incentivized pension sponsors to invest in riskier assets. This inference is supported by cross-sectional tests demonstrating that the reduction in risk-taking is concentrated in sponsors (1) for which the financial reporting incentives for risk-taking, pre-ASU, were stronger to begin with, and (2) for which the ASU particularly reduced those financial reporting benefits to risk-taking. Our findings provide the most direct evidence to date that the expected return-based expensing model drives pension risk-taking for US sponsors; they also highlight the role of financial statement *presentation* in driving manager behavior, a topic overshadowed by measurement and recognition – both in pension accounting and more broadly in financial reporting.

The ASU 2017-07 setting allows us the opportunity to gain insights not only into pension accounting, but also into broader conceptual questions on earnings presentation. Libby and Emmett (2014) characterize the latter as having received "little guidance" from standard-setters, with most standard-setting activity focusing instead on measurement and timing of recognition.[30] In addition to demonstrating that presentation carries real economic consequences in the pension setting, our findings inform on which performance metrics "matter", and specifically, does operating income matter incrementally to net income? Mechanically, operating income is a subtotal of net income, such that any earnings component that is a part of the former is by construction also included in the latter. Thus, it is difficult to determine whether managerial actions undertaken to report a favorable number for such a subtotal are driven by incentives to report a favorable number for that subtotal (i.e., operating income) specifically, or by incentives to report favorable net income. Our setting moves us closer to such inference. While net income – the bottom line on the income statement – is

[30] Libby and Emmett (2014) base these observations on the following: (i) presentation issues on structure, classification, and disaggregation of information on the income statement have shown up only intermittently on the FASB's technical agenda; (ii) no significant standards have been issued on these topics beyond "two compromises" on OCI presentation and standards on segment reporting; (iii) the basic structure and content of the income statement under US GAAP follows SEC guidance, and has remained largely unchanged for generations; (iv) joint IASB/FASB projects on financial statement presentation have to date been placed on indefinite hold.

indisputably relevant for valuation and contracting, our findings imply that at least some of the pension risk-taking observed in the pre-ASU era was in the interest of reporting higher operating income. If stakeholders use operating income as a measure of "core" earnings, which reflects sustainable performance going forward, then managers could be responding to those perceptions by focusing in turn on operating income.

Our findings are perhaps most surprising when considered in context of the fact that US GAAP, to date, has not formally defined operating income or formulated any rules for how it should be measured. Nor does GAAP even require the disclosure of operating income in a multi-step income statement. In fact, the FASB's Agenda Consultation (2016) discussed formally developing an operating performance measure.[31] User feedback to this proposal indicated strong support for improving the extant performance reporting model, citing the increasing demand for and use of non-GAAP measures (such as EBIT and EBITDA) in recent years as evidence of the shortcomings of GAAP income in measuring sustainable, ongoing performance. However, respondents also highlighted the complexities of defining operating income in a broadly applicable manner, given the variety of industries and business models in existence; the FASB did not proceed with that project eventually.

The ASU itself is an interesting postscript to these developments, with many observing that the FASB, by requiring certain pension cost components to be presented outside operating income, would implicitly be defining operating income (ASU 2017-07, Paragraph BC21) – for example, that it would "establish a distinction between operating and non-operating expenses that exceeds those required by other accounting standards" (Price WaterhouseCoopers 2016b). Respondents also noted inconsistencies with conceptually similar components in other topic areas.[32] As "no comprehensive framework exists in GAAP to distinguish between operating

[31] Available at: https://www.fasb.org/jsp/FASB/Document_C/DocumentPage?cid=1176168357653&acceptedDisclaimer=true

[32] James L. Kroeker, FASB Board member who dissented to the issuance of ASU 2017-07, summarized some of these inconsistencies: costs associated with exit or disposal activities, as long as they do not pertain to discontinued

and non-operating expenses" (Price WaterhouseCoopers 2016b), respondents encouraged the FASB to "address presentation of items within or outside of operating income holistically within US GAAP" (Ernst & Young 2016).

Capping these developments is the prominence given to performance reporting in the FASB's most recent Agenda Consultation (2021), which lists the definition of operating income as a specific question on which feedback is sought from constituents. Our findings have direct relevance for this discussion, by indicating that subtotaling and labeling on the income statement go beyond being "simple format issues" (Libby and Emmett 2014); they appear to have economic consequences. Operating income – as reported on the income statement – still matters to managers, and does so despite the widespread prevalence of proforma, non-GAAP measures. Our study can be seen as providing an early look into the potential consequences of formally defining operating income, which could dislodge and relocate line items from many topic areas beyond pensions.

Moving to the implications for pensions themselves, our setting allows us to conclude that the pension expensing model in US GAAP creates some tilt towards riskier investments such as equities – providing direct evidence on the economic consequences of one of the most contentious provisions in the FASB's standard-setting history.[33] The controversy surrounding ERR-based expense smoothing only serves to make its endurance more striking: the FASB has not eventually reconsidered the expensing model, despite its own characterization of smoothing

operations, and gains or losses on disposal of long-lived assets, are required to be presented within operating income. However, under ASU 2017-07 guidance, gains/losses associated with curtailing or settling a pension plan are to be presented outside operating income. This inconsistency is amplified when considering the context that curtailments/settlements are often done as part of an exit or disposal activity. In other examples, many costs associated with the passage of time are required to be presented in operating income – e.g., the accretion component associated with asset retirement obligations or interest costs embedded in the rental payments for operating leases. However, under ASU 2017-07 guidance, the interest cost component of pension cost – also a cost associated with the passage of time – will now be presented outside operating income.

[33] Flesher, Foltin, Previts, and Stone (2019), in their history of pension standard-setting in the US, describe the original proposals of what became SFAS 87 as being opposed by "seven of the Big Eight accounting firms and practically every major US corporation", characterizing the complexities of US pension accounting rules as having "no basis in accounting" and "simply approaches designed to reduce the earnings volatility that the preparer community did not want to contend with".

as one step in its "evolutionary search for more meaningful and more useful" pension accounting, and its characterization of that accounting model as being "in a transitional stage" that had "not yet fully crystallized" (SFAS 87, Paragraph 5).[34] Paradoxically, the criticism of expense smoothing is summed up perfectly by the FASB itself, in SFAS 5 *Accounting for Contingencies:* "Earnings fluctuations are inherent in risk retention, and they should be reported as they occur. The Board cannot sanction the use of an accounting procedure to create the illusion of protection from risk when, in fact, protection does not exist." And yet, as Zion, Varshney, and Burnap (2011) point out, pension accounting appears to be a special case – an exception to this principle. We demonstrate that this exception has economic consequences.

Documenting a reporting-induced tilt towards equities generates opportunities for future research. First, we still do not know how large that tilt is; the reduction in risky investment spurred by ASU 2017-07 only provides a lower bound to the tilt. As the ASU only removes the financial reporting benefits of risk-taking from operating income, those benefits still flow into net income. To the extent to which net income is key to valuation and contracting, there could still be some residual tilt towards equities induced by the smoothing model.

Second, what role does the tilt play, if any, in the continued health and survival of DB pensions? In other words, does it push risk-taking towards "excessive" levels, i.e., levels that cause more plans to fail in distress terminations than would have in a regime that accounts for the costs and benefits of risk-taking more evenhandedly? Or does it move sponsors closer to an optimal level of risk-taking, i.e., a level that allows benefits to be provided more cheaply and efficiently over the long term, in turn facilitating the sustenance of more benefit plans by

[34] One critical moment in this regulatory history was the FASB's announcement of a comprehensive, two phased review of pension accounting in 2006, to consider first the balance sheet and second the income statement (SFAS 158 Basis for Conclusions, Paragraphs B16-B36). The first phase culminated in SFAS 158, with many requests for reconsidering pension expensing postponed to the second phase. That second phase, however, did not eventually materialize. Another key moment was the IASB's reconsideration of pension expensing with IAS 19R, when some commentators predicted similar moves from the FASB. E.g., "In our view it's just a matter of time before the accounting officially changes in the U.S. too." (Zion, Varshney, and Burnap 2011). Despite these events, pension expensing in US GAAP remains unchanged.

more employers (who would otherwise have closed their plans or cut benefits)? These questions are beyond the scope of our present study, which is focused on answering a positive question (i.e., *does* the financial reporting model tilt towards equities) rather than the more normative question of *should* it tilt toward equities. That said, we view our present findings as documenting a necessary, first, step towards answering these broader questions, which are not only of interest to academics but also of great importance to many stakeholders including investors, private-sector workers, and the government.

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Appendix A
Description of Reporting Changes Mandated by ASU 2017-07

ASU 2017-07 under US GAAP became effective for fiscal periods beginning after December 15, 2017. Its main provisions require employers to report: (1) the service cost component of periodic pension cost in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period, as part of operating income and (2) the other components of pension cost (besides service cost) separately from the service cost component and outside a subtotal of income from operations, if such a subtotal is presented. The FASB acknowledges that an entity may use a variety of presentations and subtotals on the face of the income statement, and therefore operating income is not always presented as a subtotal on the income statement. If operating income is not presented on the income statement, ASU 2017-07 allows the entity to have discretion to present the other components of pension cost other than service cost wherever it is appropriate in the income statement (ASU 2017-07, Paragraph BC20).

The FASB's reasoning for requiring the separation of service cost from the other components is that service cost is the component that exclusively originates from employee services during the current period, and potentially has a significantly different effect in terms of information usefulness to financial statement users. Below is a summary of the change in reporting requirements under ASU 2017-07 for each of the major components of pension cost, along with the resulting effects of whether the change increases or decreases reported operating income:

	Pre-ASU 2017-07: Typically included in operating income ?	Post-ASU 2017-07: Included in operating income?	Direction of effect of ASU 2017-07 on operating income
Service cost	Yes	Yes	No change
Interest cost	Yes	No	Increase
Expected return	Yes	No	Decrease
Amortization of gains/losses	Yes	No	Increase for losses Decrease for gains
Amortization of prior service cost	Yes	No	Increase

Appendix B
Variable Definitions

Variable	Description	Source
Dependent Variables		
% FIXED INCOME	Percentage of pension assets invested in fixed income securities and cash and cash equivalents	*10-K*
% EQUITY	Percentage of pension assets invested in equity securities	*10-K*
Independent Variables - Pension Characteristics		
POST	This indicator variable is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018.	
US	This indicator variable is set to 1 for US firms, and 0 for Canadian firms	
Horizon	Investment horizon, measured as the natural log of the ratio of PBO to current service cost. If current service cost is 0 or blank, we replace the service cost by a small value of 0.000001	*pbpro, pbpru, svc*
ERR	Expected rate of return	*10-K*
FVPA ($ Million)	Fair value of plan assets at the end of the period	*10-K*
PBO ($ Million)	Projected benefit obligation at the end of the period	*10-K*
Fund Ratio	Funding ratio obtained from 10-K data, measured as the fair value of plan assets divided by the projected benefit obligation	*10-K*
Fund Ratio Square	Square of *Fund Ratio*	*10-K*

Independent Variables – Firm Characteristics

SDCF ($Million)	Operating risk, measured as the standard deviation of the ratio of cash flow from operations to book value of equity for five years, ending in the current year	*oancf, bkvlps, csho*
Market Returns	12-month returns to S&P Global Broad Market Index for equities	https://www.spglobal.com/spdji/en/indices/equity/sp-global-bmi/#overview
Market Cap ($Million)	Market capitalization. It is the product of year-end share price and number of ordinary shares outstanding	*prcc_f, csho*
Size	Natural log of market cap	*prcc_f, csho*
Leverage ($Million)	Ratio of long-term debt to total assets	*dltt, at*
NOL ($ Million)	Indicator set to one if prior period has a tax loss carry forward. Else, set to zero	*tlcf*
Dividends	Total dividends divided by total assets	*dvc, at*

Partitioning Variables

High expected return/other pension costs	This indicator variable is set equal to one when the ratio of expected return to all other components of pension cost is greater than the median, and set equal to zero otherwise. The ratio of expected return to all other components of pension cost is computed as (-1) * Dollar value of expected return divided by the value of all components of pension cost.	*Expected return in $ = pprpa* *Other remaining pension costs = (ppic+ppsc+ppopcc)*
High fvpa/operating income	This indicator variable is set equal to one when the ratio of fair value of plan assets to operating income is greater than the median, and set equal to zero otherwise. If operating income is negative, we take the average of previous 3 years' operating income. If the 3-year average is also negative, this variable is missing.	*Operating income = OIADP* *FVPA is from 10-K*
Analyst estimate available for operating profit	This indicator variable is set to one if there is at least one analyst estimate of operating profit, and set to zero otherwise	*IBES*

High value relevance of operating income	This indicator variable is set to one when the ratio of the R-squared of the price-operating income regression to the R-squared of the price-net income regression is greater than the median, and set equal to zero otherwise. We define the median values of this ratio separately for Canadian and US firms. Both the price-operating income regression and price-net income regression are run using 16 quarters of data just prior to the beginning of the post-period. Operating Income regression: $$P_{i,t+3} = \alpha_1 + \beta_1 * Operating\ Income_{i,t} + \epsilon_1$$ Net Income regression: $$P_{i,t+3} = \alpha_2 + \beta_2 * Net\ Income_{i,t} + \epsilon_2$$ $P_{i,t+3}$ is the market value per share defined as the closing share price three months after the fiscal quarter end; Operating income and net income are per share values.	*prccm, oiadpq, niq*
Operating income in executive compensation	This indicator variable is set to one for US firms with an operating income component in the compensation contracts of its CEO or CFO in the year immediately before ASU 2017-07, and set to zero otherwise	*Incentive Lab*

Appendix C
Entropy balancing procedure

We use entropy balancing method to achieve a balance of covariates between our treated sample (i.e., US firms) and control sample (i.e., Canadian firms). Entropy balancing creates a set of weights for the control sample such that the first, second, and higher moments of the covariate distributions in the treatment and the reweighted control sample are equalized (Hainmueller 2012). To achieve this, entropy balancing places higher weights on Canadian firms that are similar to the US firms along the chosen balancing dimensions (Ferri et al. 2018; McMullin & Schonberger 2020; Shroff et al. 2017). Entropy balancing is particularly helpful in preserving the size of the control sample, which is pertinent when the size of the treated and control samples are vastly different (Laurion 2020).

We choose to balance on the mean of the following variables: *Size, Leverage, SDCF, NOL, Dividend, PBO, FVPA, Fund Ratio, Fund Ratio Square,* and *Horizon*. After entropy balancing, all variables have equivalent means between treatment and reweighted control samples.

Next, we tabulate the distribution properties of the US (treatment) firms and the Canadian (control) firms before and after applying our entropy balancing procedure.

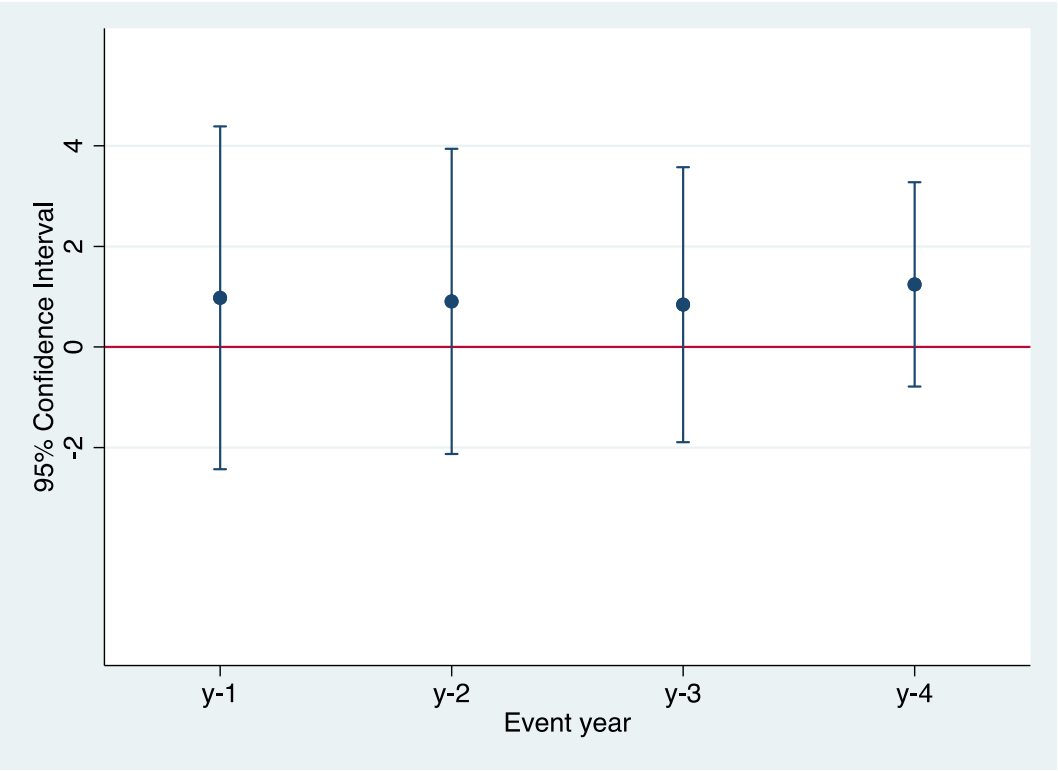
Table C1

Pre- and post-weighting distributional properties of treatment and control firms

VARIABLES	US Pre-Period			Before Entropy Balancing Canada Pre-Period			After Entropy Balancing Canada Pre-Period		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Size	746	8.128	1.917	120	7.199	2.099	120	8.126	1.605
Leverage	746	0.252	0.189	120	0.233	0.184	120	0.252	0.155
SDCF ($'m)	746	0.338	1.201	120	0.570	1.935	120	0.339	1.220
NOL	746	0.575	0.495	120	0.542	0.500	120	0.575	0.495
Dividend	746	0.0166	0.0233	120	0.0157	0.0180	120	0.0166	0.0173
PBO (S'm)	746	1745	4187	120	1366	3020	120	1745	2997
FVPA ($'m)	746	1980	4674	120	1440	3095	120	1979	3361
Fund Ratio	746	0.836	0.194	120	0.880	0.194	120	0.836	0.194
Fund Ratio Square	746	0.737	0.328	120	0.811	0.302	120	0.737	0.276
Horizon	746	7.495	5.770	120	6.149	5.219	120	7.495	6.435

This table presents the distributional properties (mean and standard deviation) for US (treatment) and Canadian (control) firms in the original sample and after the reweighting of the control sample using entropy balancing technique. We use entropy balancing method to achieve a balance of covariates between our treated sample and control sample. We choose to balance on the mean of the variables listed in this table, using its values in the pre-period. The weights thus obtained for the control sample are used for the full period.

Figure 1
Coefficient Plot for Parallel Trends in the Pre-period



This figure plots the coefficients and 95% confidence intervals for the four years prior to the event year in order to check for parallel trends in the pre-period. We obtain these coefficients by regressing *%EQUITY* on separate binary variables coded to one for US firms in year t-1 to t-4, and 0 otherwise. The year t-5 acts as a baseline year. We include all the firm level controls along with firm fixed effects, similar to our main regression specification. The plotted coefficients represent the difference between *%EQUITY* for US firms and Canadian firms in that period as compared to the baseline year. None of the coefficients are significant. Consistent with parallel trends, we find that the coefficients are not increasing or decreasing in the pre-treatment period.

Table 1
Sample Selection

	US # Observations	Canada # Observations	Total # Observations
No of firms that sponsor a defined benefit pension plan with data for the last fiscal year before ASU2017-07	1,328	198	1,526
Less: Canadian firms reporting under US GAAP		(19)	(19)
Less: Observations with missing values for dependent variables and controls	(498)	(49)	(547)
Less: Observations dropped due to not having both pre- and post	(80)	(10)	(90)
Less: Voluntary early adopters	(4)		(4)
Number of firms in the sample	746	120	885
Number of firms X 2 (one-year before and after ASU 2017-07)	1492	240	1732

Table 2
Descriptive Statistics – USA Sample

PANEL A: USA Sample: Pre-Period

	P25	P50	P75	Mean	SD
%EQUITY	25.33	43.22	57.61	40.41	21.68
%FIXED INCOME	31.84	42.00	57.00	45.04	21.07
ERR (%)	5.580	6.500	7.070	6.198	1.352
SDCF (S'm)	0.0341	0.0648	0.133	0.338	1.201
Market Cap (S'm)	1,165	3,494	13,547	14,920	32,090
Leverage	0.0911	0.253	0.355	0.252	0.189
Horizon	3.918	4.652	7.082	7.495	5.770
Dividends	0.00110	0.00960	0.0227	0.0166	0.0233
Fund Ratio	0.747	0.842	0.937	0.836	0.194
Fund Ratio Square	0.559	0.709	0.879	0.737	0.328
NOL	0	1	1	0.575	0.495
Market Return	0.218	0.218	0.218	0.189	0.0619
FVPA (S'm)	58.78	297.8	1200	1745	4187
PBO (S'm)	80.1	350.4	1351	1980	4674
Size	7.061	8.159	9.514	8.128	1.917

PANEL B: USA Sample: Post-Period

	P25	P50	P75	Mean	SD
%EQUITY	16.84	36	52	34.82	21.56
%FIXED INCOME	35.30	47.16	64.78	50.37	22.67
ERR (%)	5.202	6.250	7	5.968	1.399
SDCF (S'm)	0.0322	0.0625	0.128	0.343	1.211
Market Cap (S'm)	876.6	2,935	11,525	13,753	31,026
Leverage	0.0813	0.251	0.365	0.254	0.189
Horizon	3.878	4.683	7.610	7.605	5.872
Dividends	0.00140	0.00981	0.0230	0.0173	0.0241
Fund Ratio	0.731	0.835	0.936	0.832	0.196
Fund Ratio Square	0.534	0.698	0.877	0.731	0.332
NOL	0	1	1	0.579	0.494
Market Return	-0.118	-0.118	-0.118	-0.0908	0.0558
FVPA (S'm)	60.4	272.6	1132	1648	4028
PBO (S'm)	74.19	325.5	1289	1882	4511
Size	6.776	7.985	9.352	7.951	1.971

Notes: All variables are defined in Appendix B. Panel A provides the descriptive statistics for US firms in the pre-ASU 2017-07 period, while panel B provides the descriptive stats for the post period

Table 3
Descriptive Statistics – Canada Sample

PANEL A: Canada Sample: Pre-Period

	P25	P50	P75	Mean	SD
%EQUITY	29.02	45.00	58.00	42.20	21.21
%FIXED INCOME	34.39	44.60	56.85	46.49	21.15
ERR (%)	3.500	3.820	4.830	4.236	1.022
SDCF (S'm)	0.046	0.092	0.159	0.570	1.935
Market Cap (S'm)	438.4	1,183	6,066	6,262	11,826
Leverage	0.070	0.214	0.347	0.233	0.184
Horizon	3.552	4.011	5.078	6.149	5.219
Dividends	0.001	0.011	0.023	0.015	0.018
Fund Ratio	0.802	0.919	0.988	0.880	0.194
Fund Ratio Square	0.643	0.844	0.976	0.811	0.302
NOL	0	1	1	0.542	0.500
Market Return	0.218	0.218	0.218	0.189	0.0699
FVPA (S'm)	39.12	145.10	991.50	1,366.00	3,020.00
PBO (S'm)	43.89	149.00	980.70	1,440.00	3,095.00
Size	6.078	7.076	8.710	7.199	2.099

PANEL B: Canada Sample: Post-Period

	P25	P50	P75	Mean	SD
%EQUITY	23.50	40.50	55.75	38.66	21.01
%FIXED INCOME	35.37	46.80	62.28	49.07	22.25
ERR (%)	3.400	3.625	4.100	3.955	0.969
SDCF (S'm)	0.053	0.092	0.175	0.575	1.932
Market Cap (S'm)	322.9	960.4	4,367	5,481	11,544
Leverage	0.087	0.223	0.363	0.243	0.189
Horizon	3.491	4.063	5.264	6.375	5.448
Dividends	0.002	0.011	0.0250	0.019	0.029
Fund Ratio	0.816	0.900	0.983	0.867	0.193
Fund Ratio Square	0.665	0.810	0.966	0.789	0.297
NOL	0	1	1	0.567	0.498
Market Return	-0.118	-0.118	-0.118	-0.0890	0.0631
FVPA (S'm)	33.50	127.30	876.20	1,245.00	2,767.00
PBO (S'm)	40.07	137.50	920.00	1,330.00	2,859.00
Size	5.777	6.866	8.382	6.915	2.178

Notes: All variables are defined in Appendix B. Panel A provides the descriptive statistics for Canadian firms in the pre-ASU 2017-07 period, while panel B provides the descriptive stats for the post period

Table 4

Correlation Matrix

	%EQUITY	%FIXED INCOME	ERR (%)	Leverage	Dividends	SDCF (S'm)	NOL	Fund Ratio	Fund Ratio Square	Horizon	Market Return	FVPA (S'm)	PBO (S'm)	Market Cap (S'm)	Size
%EQUITY	1.00														
%FIXED INCOME	-0.48***	1.00													
ERR (%)	0.45***	-0.43***	1.00												
Leverage	-0.09***	0.04	-0.05**	1.00											
Dividends	-0.07***	0.03	0.04	0.15***	1.00										
SDCF (S'm)	-0.02	0.00	-0.00	0.30***	0.13***	1.00									
NOL	-0.14***	0.06**	-0.16***	0.20***	-0.03	0.06**	1.00								
Fund Ratio	-0.00	0.10***	0.16***	-0.15***	0.06**	-0.06**	-0.18***	1.00							
Fund Ratio Square	-0.01	0.10***	0.11***	-0.18***	0.04	-0.07**	-0.18***	0.97***	1.00						
Horizon	0.02	-0.04	-0.04	-0.11***	-0.12***	0.02	-0.03	0.06**	0.06**	1.00					
Market Return	0.13***	-0.12***	0.08***	0.00	-0.02	-0.02	0.00	-0.01	-0.01	-0.02	1.00				
FVPA (S'm)	-0.09***	-0.00	0.16***	0.03	0.17***	0.12***	-0.06**	0.10***	0.07**	-0.17***	0.01	1.00			
PBO (S'm)	-0.08***	-0.01	0.17***	0.03	0.18***	0.12***	-0.04	0.06**	0.03	-0.16***	0.01	0.99***	1.00		
Market Cap (S'm)	-0.09***	-0.05*	0.06**	0.03	0.31***	0.10***	-0.03	0.08***	0.06**	-0.15***	0.02	0.70***	0.69***	1.00	
Size	-0.19***	0.03	-0.01	0.17***	0.32***	0.05**	-0.01	0.06**	0.05*	-0.27***	0.04	0.48***	0.48***	0.63***	1.00

Notes: This table presents Pearson correlation coefficients. All variables are defined in Appendix B.

*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels respectively.

Table 5

Difference-In-Difference Regressions of %EQUITY or % FIXED INCOME Using US Firms (Treatment) and Canadian Firms (Control)

%EQUITY (%FIXED INCOME) = β0 + β1 POST + β2 US + β3 US * POST + Σ CONTROLS

	Panel A: No Entropy Balancing		Panel B: Entropy Balancing	
DEPENDENT VARIABLE	%EQUITY	%FIXED INCOME	%EQUITY	%FIXED INCOME
	(1)	(2)	(3)	(4)
POST	-2.863***	2.297**	-2.630**	2.544**
	(0.981)	(1.066)	(1.121)	(1.210)
US X POST	-1.764**	2.445***	-2.266***	2.646***
	(0.747)	(0.872)	(0.851)	(0.914)
Size	0.660	-0.742	1.576	-1.080
	(1.099)	(1.066)	(1.056)	(1.012)
Leverage	5.156	-5.304	1.135	-5.776
	(4.161)	(5.761)	(6.990)	(8.059)
SDCF	0.0351	-0.0619	-0.153	-0.0309
	(0.457)	(0.518)	(0.468)	(0.532)
NOL	2.799***	-2.037**	2.203***	-1.823**
	(0.869)	(1.021)	(0.844)	(0.867)
Fund Ratio	-30.35	32.20	-42.00	3.175
	(42.53)	(54.63)	(50.14)	(60.67)
Fund Ratio Square	-0.730	2.938	3.477	22.64
	(25.25)	(31.61)	(27.08)	(33.60)
Horizon	-0.0504	0.0687	0.0590	0.127
	(0.215)	(0.242)	(0.125)	(0.122)
Dividends	-0.0189	6.720	-21.63	28.64
	(20.29)	(23.49)	(19.70)	(19.89)
Market Return	3.567	-2.195	2.062	-0.312
	(2.632)	(2.727)	(3.126)	(3.315)
Constant	58.29***	24.17	58.89**	36.07
	(19.26)	(24.40)	(24.13)	(28.48)
Observations	1,732	1,732	1,732	1,732
R-squared	0.243	0.188	0.248	0.192
Number of firms	866	866	866	866
Cluster SE by firm	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
Panel A presents the results of the difference-in-difference specification without entropy balancing, while panel B presents the results with entropy balancing. The details of entropy balancing are presented in Appendix C. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018, and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest US X POST is an interactive term. Due to firm fixed-effects, the coefficient of US is suppressed.

Table 6
Difference-In-Difference Regressions of %EQUITY Using US Firms (Treatment) and Canadian Firms (Control)

%EQUITY = β0 + β1 POST + β2 US + β3 US * POST + Σ CONTROLS

	PANEL A: High values of expected return/other pension costs		PANEL B: Low values of expected return/other pension costs
POST	-2.157		-0.889
	(1.310)		(1.595)
US X POST	-3.980***		-0.411
	(1.217)		(1.341)
Size	1.252		0.560
	(1.579)		(1.443)
Leverage	3.451		6.251
	(10.33)		(6.044)
SDCF	-0.380		2.076
	(0.576)		(1.567)
NOL	2.248*		1.650*
	(1.287)		(0.978)
FundRatio	-191.1		-16.94
	(145.6)		(50.58)
FundRatio Square	66.60		-0.336
	(72.67)		(30.91)
Horizon	0.0412		-0.182
	(0.173)		(0.511)
Dividends	8.841		-22.99
	(56.61)		(14.80)
Market Return	4.200		10.57**
	(3.884)		(4.687)
Constant	141.2*		49.96**
	(73.03)		(21.99)
Difference in coefficients of US X Post across the two sub-samples		chi2(1) = 7.89*** Prob > chi2 = 0.0050	
Observations	820		824
R-squared	0.318		0.270
Number of firms	410		412
Cluster SE by firm	YES		YES
Firm FE	YES		YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
Panel A contains firms with high values (i.e. above median) of the ratio of expected return to all other components of pension costs in the year immediately before ASU 2017-07, and panel B contains firms with low values (i.e. below median) of the same ratio in the year immediately before ASU 2017-07. If expected returns or any of the other costs are missing, this ratio is left undefined. We define the median values of this ratio separately for Canadian and US firms in the year immediately before ASU 2017-07. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest US X POST is an interactive term. Due to firm fixed-effects, the coefficient of US is suppressed.

Table 7
Difference-In-Difference Regressions of %EQUITY Using US Firms (Treatment) and Canadian Firms (Control)

%EQUITY = β0 + β1 POST + β2 US + β3 US * POST + Σ CONTROLS

	PANEL A: High values of fvpa/operating income		PANEL B: Low values of fvpa/operating income
POST	-2.022*		-4.585***
	(1.064)		(1.716)
US X POST	-2.499***		-1.873
	(0.691)		(1.307)
Size	0.451		0.696
	(1.473)		(1.916)
Leverage	2.871		-1.418
	(3.880)		(13.34)
SDCF	-0.440		1.416
	(0.443)		(2.030)
NOL	1.220		2.689**
	(0.904)		(1.286)
FundRatio	-61.72		-43.36
	(46.70)		(58.86)
FundRatio Square	24.43		-1.160
	(26.69)		(32.41)
Horizon	0.112		-0.206
	(0.0679)		(0.346)
Dividends	-19.60		-20.46
	(24.08)		(19.60)
Market Return	1.567		-0.726
	(2.941)		(5.062)
Constant	69.78***		73.17**
	(20.47)		(32.94)
Difference in coefficients of US X Post		chi2(1) = 0.36 Prob > chi2 = 0.5462	
Observations	832		832
R-squared	0.291		0.255
Number of firms	416		416
Cluster SE by firm	YES		YES
Firm FE	YES		YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
Panel A contains firms with high values (i.e. above median) of the ratio of fair value of plan assets to operating income in the year immediately before ASU 2017-07, and panel B contains firms with low values (i.e. below median) of this ratio in the year immediately before ASU 2017-07. If operating income is negative, we use the average operating income in the past three years ending in the current year. If the three-year average operating income is negative, this variable is undefined and the observation is removed from this analysis. We define the median values of this ratio separately for Canadian and US firms in the year immediately before ASU 2017-07. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest US X POST is an interactive term. Due to firm fixed-effects, the coefficient of US is suppressed.

Table 8
Difference-In-Difference Regressions of %EQUITY Using US Firms (Treatment) and Canadian Firms (Control)

%EQUITY = β0 + β1 POST + β2 US + β3 US * POST + Σ CONTROLS

	PANEL A: Analyst estimate available for operating profit		PANEL B: Analyst estimate not available for operating profit
POST	-2.847**		-3.733**
	(1.234)		(1.490)
US X POST	-2.844***		-1.462
	(0.901)		-1.091
Size	2.374		-0.179
	(1.653)		(1.527)
Leverage	-4.316		8.480
	(5.352)		(7.294)
SDCF	-0.165		-0.00799
	(1.066)		(0.285)
NOL	-0.494		3.602***
	(0.779)		(1.184)
FundRatio	54.63		-75.83
	(107.0)		(62.35)
FundRatio Square	-43.17		17.56
	(62.16)		(33.39)
Horizon	-0.135		0.301**
	(0.207)		(0.141)
Dividends	-41.82**		-15.69
	(20.32)		(18.08)
Market Return	-2.326		1.449
	(3.869)		(4.064)
Constant	5.010		90.29***
	(45.20)		(30.01)
Difference in coefficients of US X Post		chi2(1) = 0.96 Prob > chi2 = 0.3283	
Observations	792		940
R-squared	0.283		0.246
Number of firms	396		470
Cluster SE by firm	YES		YES
Firm FE	YES		YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
Panel A contains firms that have at least one analyst estimate of operating profit in the year immediately before ASU 2017-07, and panel B contains firms with no analyst estimate of operating profit in the year immediately before ASU 2017-07. Firms that are not present in the IBES database are treated as not having any analyst estimate of operating profit, i.e. they are included in the Panel B sub-sample. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest US X POST is an interactive term. Due to firm fixed-effects, the coefficient of US is suppressed.

Table 9
Difference-In-Difference Regressions of %EQUITY Using US Firms (Treatment) and Canadian Firms (Control)

%EQUITY = β0 + β1 POST + β2 US + β3 US * POST + Σ CONTROLS

	PANEL A: High value relevance of operating income		PANEL B: Low value relevance of operating income
POST	-3.259**		-4.610***
	(1.292)		(1.365)
US X POST	-2.561**		-1.200
	(1.203)		(0.979)
Size	1.132		-0.0544
	(1.578)		(1.879)
Leverage	9.125		2.106
	(12.94)		(4.959)
SDCF	1.287		-0.243
	(1.880)		(0.427)
NOL	2.910***		0.895
	(0.898)		(1.398)
FundRatio	-37.92		-70.26
	(67.19)		(44.98)
FundRatio Square	2.612		16.24
	(35.30)		(25.58)
Horizon	0.230		-0.0164
	(0.144)		(0.265)
Dividends	2.248		-22.03
	(37.88)		(14.81)
Market Return	0.358		-0.954
	(3.507)		(3.370)
Constant	55.70		90.26***
	(34.93)		(22.78)
Difference in coefficients of US X Post		chi2(1) = 1.56 Prob > chi2 = 0.2113	
Observations	866		866
R-squared	0.218		0.308
Number of firms	433		433
Cluster SE by firm	YES		YES
Firm FE	YES		YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
Panel A contains firms with high (i.e. above median) value relevance of operating income as compared to net income, and panel B contains firms with low (i.e. below median) value relevance of operating income as compared to net income. Value relevance of operating income is calculated as the ratio of R-square of operating income regression to the R-square of net income regression using 16 quarters of data just prior to the beginning of the post-period.
We define the median values of this ratio separately for Canadian and US firms in the period immediately before ASU 2017-07. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest US X POST is an interactive term. Due to firm fixed-effects, the coefficient of US is suppressed.

Table 10
Regressions of %EQUITY Using US Firms in the Pre-period (Treatment) and US Firms in the Post-period (Control)

%EQUITY = β0 + β1 POST + Σ CONTROLS

	PANEL A: Has operating income in executive compensation		PANEL B: Doesn't have operating income in executive compensation
POST	-7.438**		-3.342***
	(3.434)		(1.056)
Size	-2.363		-0.148
	(2.046)		(1.512)
Leverage	19.81		-3.412
	(13.08)		(4.263)
SDCF	4.878**		-0.144
	(2.052)		(0.451)
NOL	3.017		2.538*
	(3.119)		(1.496)
FundRatio	5.411		-81.20
	(147.6)		(130.7)
FundRatio Square	-20.92		33.89
	(99.77)		(75.33)
Horizon	0.418		-0.888**
	(0.336)		(0.449)
Dividends	59.10**		-11.08
	(24.54)		(66.63)
Market Return	-4.697		6.602*
	(11.19)		(3.841)
Constant	53.96		86.74
	(59.11)		(53.45)
Difference in coefficients of US X Post across the two sub-samples		chi2(1) = 2.73* Prob > chi2 = 0.098	
Observations	235		611
R-squared	0.279		0.310
Number of firms	119		309
Cluster SE by firm	YES		YES
Firm FE	YES		YES

Notes: All variables are defined in Appendix B. Standard errors are clustered by firm.
*, **, *** Denote statistical significance at 10 percent, 5 percent, and 1 percent levels, respectively (two-tailed tests). Robust standard errors are shown in parentheses.
This test is run only on US firms covered by the Incentive Lab database. Panel A contains US firms with operating income component in the compensation contracts of the CEO or CFO in the year immediately before ASU 2017-07, while US firms without operating income component in the compensation contracts of its executives are in panel B. POST is an indicator variable that is set to 1 for fiscal years ending on or after Dec 15th, 2018 and set to 0 for fiscal years ending Dec 15th, 2017 to Dec 14th 2018. The variable of interest is POST.