Incorporating Financial Statement Information in Congressional Budget Office Forecasts of Corporate Tax Revenues

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ABSTRACT

The Congressional Budget Office's (CBO) baseline corporate income tax revenue projections play an important role in federal budgeting and legislative decisions, yet they exhibit some of the largest errors among major revenue categories. These forecasts depend on projections of corporate economic profits and a series of adjustments that reconcile these profits to the tax base. We find that financial statement data can improve forecast accuracy for several adjustments, particularly those related to bad debts, foreign profits, state and local taxes, and pensions. The informativeness of these data varies by adjustment: summary measures (e.g., pretax income and BTDs) are useful in some cases, while adjustment-specific variables provide incremental value in others. Overall, our findings highlight how accounting information can improve government forecasting and inform policy decisions.

Keywords: Taxable income; tax policy; forecasting; financial reporting
JEL Codes: M41, M48, H25

The views expressed in this paper are those of the authors and do not necessarily represent those of the Congressional Budget Office. All errors are our own.

I. INTRODUCTION

The Congressional Budget Office (CBO) is a non-partisan office that supports Congress by producing a "baseline" forecast of federal revenues and spending under current law. Published each winter and updated later in the fiscal year, the baseline forecast includes estimates of spending and revenues for the current and ten following fiscal years. CBO's baseline forecasts are central to the legislative process, serving as both a benchmark to evaluate the fiscal effects of proposed legislation and as an alternative to the projections produced by the Executive Branch's Office of Management and Budget (OMB).[1]

CBO builds its baseline forecast from detailed projections of each major federal revenue source and major governmental spending activity using a range of data and models.[2] These projections can be highly uncertain, in part, because they rely on macroeconomic factors (e.g., employment, personal income, investment) that are difficult to predict. Corporate income tax revenue is especially volatile and difficult to forecast (CBO 2023a). In this study, we incorporate financial statement information into CBO's process to forecast corporate income tax revenue to understand whether, and how, it can improve its accuracy.

CBO's corporate income tax revenue projections begin with a forecast of the Bureau of Economic Analysis (BEA) measure of corporate profits contained in the National Income and Product Accounts (NIPA). CBO then forecasts a series of line-item adjustments to reconcile the income and expenses included in NIPA corporate profits to those included in the corporate tax base as defined by the Internal Revenue Code (IRC; BEA 2020). NIPA corporate profits are

[1] The staff of the Joint Committee on Taxation ("JCT") is tasked with preparing estimates for proposed legislation affecting revenues. JCT's estimates rely on the CBO baseline projections. JCT and CBO work together on estimates when legislation affects both revenue and outlays. For a brief overview of CBO's responsibilities, see https://www.cbo.gov/about/overview.

[2] For a description of how CBO's baseline projections are developed, see Congressional Budget Office (2023b).

distinct from the U.S. corporate tax base because not all corporate entities are subject to the corporate income tax (e.g., S corporations) and because there are differences in the measurement of certain items of income or expense underlying each concept. For example, bad debt expenses are deductible for tax when worthless but are not included in NIPA corporate profits. CBO then separately estimates the aggregate tax base for corporations with aggregate positive and aggregate negative income, since the corporate tax is levied only on positive income. This step is particularly challenging due to the volatility of corporate income. Many of the reconciliation adjustments depend on economic or tax data that are not finalized until up to two years after year-end, which increases the risk of forecast errors. Further, the macroeconomic data used are revised several times before final values are available, introducing additional uncertainty to CBO's initial projections.

Because financial reports are released in their final form much sooner than standard economic and tax data, they provide more timely and reliable information on corporate profitability. Financial reports also contain granular details about corporations' income and expense items that may inform the reconciliation adjustments, like bad debt. Further, financial reporting rules allow management to signal expected future income or expenses through certain accounts. This timely, forward-looking financial statement information could help CBO improve its baseline projections of corporate income tax revenue, especially during periods of economic disruption or legislative change when past data are less representative of current conditions.

Prior research finds that, when aggregated, financial statement profitability is a robust predictor of macroeconomic indicators, such as GDP (Konchitchki and Patatoukas 2014), the corporate tax base (Green, et al. 2022), state tax revenue growth (Welsch, Williams and Mills, 2024); inflation (Shivkumar 2007), and labor market outcomes (Hann, Li and Ogneva 2021).

However, these studies are not directly applicable to CBO's baseline forecast process. In contrast to producing an unconstrained forecast of revenue, CBO constructs the tax base through a series of line-item adjustments that reconcile NIPA corporate profits with taxable income and is consistent with CBO's own macroeconomic projections. We examine whether financial statement information can improve CBO's estimates of the adjustments underlying its taxable income forecasts. Because these adjustments collectively determine the corporate income tax base, improving their forecasts should also improve estimates of the tax base. In doing so, our study complements Green et al. (2022) by shifting the focus from predicting aggregate taxable income to improving the underlying components of the tax base within a structured government forecasting process such as the CBO.

We draw on both prior accounting research and the technical details of Generally Accepted Accounting Principles (GAAP) to address this important practical problem. Using our joint understanding of both financial reporting and CBO's forecasting process, we identify four adjustments most likely to benefit from financial statement information: bad debt expense, foreign profits, state and local income taxes, and employer expenses for pensions. We also test whether financial statement information can improve CBO's estimate of the split between aggregate positive and negative corporate income (the "profit and loss split").

Where applicable, we construct a simplified version of CBO's corporate forecasting model for each specific adjustment (referred to as the "*CBO Base Model*"), and in all cases tailor our specification to reflect CBO's underlying estimation process. We then augment these specifications with variables drawn from financial reports that align with CBO's rationale for each reconciliation adjustment and with the profit and loss split. We find financial statement information improves the accuracy of the adjustments for bad debt expense, foreign profits, state

and local income taxes, and pensions, but does not improve the estimation of profit and loss split. These findings suggest that financial statement data can complement CBO's existing models, but improvements are not guaranteed.

CBO periodically evaluates the accuracy of its projections and adjusts its models and methodologies to improve performance (CBO 2023a). This study is the result of a collaboration between academic researchers and CBO staff, combining academic insights with detailed knowledge of CBO's estimation process to address a practical challenge related to the accuracy of its baseline projections: the lack of timely data for forecasting corporate tax revenues. In doing so, we also answer the American Accounting Association's (AAA) call for research that bridges theory and practice (Schrand 2019) and demonstrate the value of practitioner–academic collaboration encouraged by the AAA's Research Relevance Task Force.[3] By showing how accounting research can be applied directly to government forecasting, we help to improve the accuracy of CBO's corporate tax revenue projections, which in turn helps Congress better evaluate policies affecting business activity and corporate taxation.

Beyond forecast accuracy, our findings suggest that financial statement data could complement the tools CBO uses to evaluate its projections in real time. For example, the U.S. Treasury publishes monthly data on gross corporate income tax receipts and refunds issued in its Monthly Treasury Statement (MTS), which CBO uses to evaluate whether its projections align with current receipts. While the MTS can highlight when revenues diverge from expectations, it does not explain *why*. Timely financial statement data can help fill this gap by providing insight into the components of the tax base driving these deviations.

[3] In 2018, AAA created a Research Relevance Task Force aimed at making accounting research more relevant. This recommendations (which may be found here: https://aaahq.org/portals/0/documents/task-force/2018%20research%20relevance%20task%20force%20report.pdf?ver=2018-07-26-135928-413) emphasize a strong connection between practitioners and academics.

Finally, our findings contribute to both the accounting and public finance literatures by illustrating where financial statement data can add predictive value in a government forecasting. We complement prior research on budget forecast accuracy (Plesko 1988; Auerbach 1999) and recent work on CBO's revenue forecast uncertainty (Burman, Page, and Weiner 2022). For practitioners and policymakers, we show that both summary measures of financial performance and targeted variables can improve forecasts, depending on the adjustment. In some settings, summary measures such as pretax income and book-tax differences are the most informative (e.g., foreign profits and state and local taxes), while in others, more targeted variables tied to the underlying adjustment (e.g., doubtful accounts for bad debts or employer contributions for pensions) perform best. These findings help direct resources to areas with the greatest impact and underscore the importance of empirical evaluation. More broadly, they illustrate how financial accounting information, often studied in the context of firm-level decision making, also plays a role in shaping fiscal policy outcomes.

II. BACKGROUND

CBO's corporate income tax revenue forecasting model proceeds in four stages as illustrated in Figure 1. CBO begins its process in stage one with a projection of the BEA's measure of NIPA *corporate profits before tax*. The BEA's measure of pre-tax corporate profits reflects the economic income earned from current production by the US corporate sector (BEA 2020).[4] CBO then estimates projections for a series of adjustments that BEA uses to connect corporate profits to the corporate income tax base, or *income subject to tax under the corporate income tax.* These adjustments, applied between stage one and stage two, adjust NIPA corporate

[4] Specifically, CBO uses the measure of corporate profits before tax without the inventory valuation adjustment (IVA) and without the capital consumption adjustment (CCAdj) from the BEA NIPA table 7.16. The NIPA measure of corporate profits is based on measures of corporate taxable income and administrative tax data provided by the Internal Revenue Service (IRS) which is first available around two years after the end of the fiscal year.

profits before tax for items of aggregate income or expense that are treated differently under tax rules than under BEA's NIPA profits measure and separate out the profits of S corporations.

The remaining *net corporate profits subject to tax* measure is then split into aggregate profits (*income subject to tax under the corporate income tax*) and aggregate losses because profits are taxed currently while losses cannot be refunded immediately.[5] CBO proceeds to stage three by projecting the effects of special rules, such as net operating loss (NOLs) carryforwards and certain categories of income taxed at rates other than the statutory rate, to arrive at its estimate of the corporate tax base. CBO then applies the corporate tax rate to this tax base and subtracts tax credits to arrive at the aggregate tax liability. In stage four, CBO projects the timing of payments during each liability year to calculate fiscal year corporate receipts (CBO 2023b, c).

We focus on CBO's process to adjust NIPA *corporate profits before tax* to arrive at projections of *income subject to the corporate income tax* (i.e., moving from stage one to stage two). Because these adjustments determine the corporate income tax base, improving their measurement can directly improve projections of corporate taxable income and tax revenues. CBO's projections of the specific differences between NIPA corporate profits and the corporate income tax base adjustments rely mainly on economic data from BEA and IRS tax return data. The timing of CBO's receipt of this data relative to when baseline forecasts are made and released is illustrated in Figure 2. Detailed final BEA data are typically released at a three-year lag relative to preparation and publication of a given year's baseline forecast. IRS data are available after about two years. Thus, CBO must base its projections on incomplete and/or stale information when linking NIPA corporate profits to corporate taxable income and ultimately fiscal year net receipts.

[5] As an example, assume CBO estimates $200 of aggregate net corporate profits subject to tax. It then disaggregates the net $200 into total aggregate profits of $300 and total aggregate losses of $100.

One potential source of more timely information is corporate financial statements. In contrast to economic data that is released in initial estimate form and then subsequently revised over several years, financial statement data summarizing corporate profits are published annually in final, audited form soon after corporations' year-ends.[6] Financial statement data not only summarizes corporate profits but also provides detailed disclosures of individual items of corporate income and expense that could inform CBO's estimation of specific adjustments.

Despite these potential advantages, CBO and other forecasters (e.g., the Penn Wharton Budget Model at the University of Pennsylvania, Moody's Economy, and the Urban-Brookings Tax Policy Center) do not currently incorporate financial statement data in their estimation processes in a systematic way.[7] CBO did use corporations' SEC Form 10-Ks to estimate direct payments related to the one-time transition tax on previously untaxed foreign profits under the Tax Cuts and Jobs Act of 2017, but does not otherwise rely on it. This is due in part to the fact that accounting data does not directly correspond to measures of the tax base or NIPA corporate profits. Nevertheless, that data may have value in projecting the adjustments that link NIPA corporate profits to taxable income and the estimation of the profit-loss split (CBO 2023c).[8]

Although financial statement data do not perfectly align with tax measures, research implies that aggregated financial statement information can improve projections of macroeconomic activity. Konchitchki and Patatoukas (2014), for example, show that aggregate

[6] Financial statement data may also be revised through restatements of previously issued financial statements. However, the revision of financial statement data is less of a concern because restatements are relatively rare because they are extremely costly for firms, resulting in negative stock price implications for both the restating firms and their industry peers (Gleason et al. 2008). For example, there were 402 earnings restatements out of approximately 4,600 publicly traded companies in 2022 (Center for Audit Quality 2024).

[7] Our review of other forecasting models, such as Moody's Economy, also indicate that they do not use financial statement data.

[8] Two coauthors of this paper, who also contributed to CBO (2023c), have direct experience with the CBO's corporate income tax forecasting process. Based on this experience, we can report that financial statement information is not incorporated into the current methodology.

financial statement income growth predicts future GDP growth, which is an important macroeconomic variable used in many of CBO's projections. Green et al. (2022) use IRS tax return data to show that financial statement information can predict future taxable income at both the individual firm and corporate sector levels. However, these studies focus on broad, aggregate measures of both corporate financial statement and taxable income and do not examine how this information can be incorporated into the process by which taxable income is constructed. For example, Green et al. (2022) forecast taxable income directly, effectively treating it as a single outcome, but do not examine its various components. By contrast, CBO constructs taxable income from a series of adjustments that reconcile economic income concepts with tax concepts. because CBO's projection of taxable income must be consistent with CBO's macroeconomic projections.

Our work builds on Green et al. (2022) in two ways. First, we shift the focus from forecasting bottom-line taxable income to examining whether financial statement information can improve specific line-item adjustments within CBO's process. Second, we move beyond summary financial statement measures by also incorporating variables tailored to each adjustment (e.g., doubtful accounts for bad debts or employer contributions for pensions). This allows us to identify not only whether financial statement data improves forecasts, but which components of those data matter most.

III. METHODOLOGY OVERVIEW

CBO begins its process with BEA's estimate of NIPA corporate profits, which is based on adjusting IRS data on total receipts less total deductions (TRLTD) for entities in the corporate sector. To evaluate financial statement information's ability to assist in the baseline forecast process, we identified the following four specific adjustments to BEA's NIPA measure

of corporate profits that are especially large or volatile and for which detailed financial statement data are available and conceptually aligned:

1. **Bad Debt Expense Deduction.** Bad debts are deductible from taxable income when receivables become worthless, but the value of that deduction must be added back to IRS TRLTD to exclude it from the NIPA corporate profits estimate.[9] To project the corporate income tax base, CBO must therefore estimate the aggregate bad debt deductions of corporations for a given year and subtract that value from projection of NIPA corporate profits.
2. **Foreign Profits.** The U.S. corporate tax base includes the U.S. income of both U.S. and foreign corporations, plus only certain types of foreign income of U.S. corporations.[10] By contrast, BEA's measure of NIPA corporate profits includes worldwide income earned by U.S. firms, but excludes income earned in the U.S. by foreign firms. This adjustment removes the worldwide income earned by U.S. firms. In a separate adjustment, CBO adds back the specific types of foreign income that are subject to U.S. taxes. We focus on the former adjustment.
3. **State and Local Corporate Income Tax Deduction.** NIPA corporate profits are measured before income taxes. When calculating taxable income, corporations deduct the state and local income taxes they pay. To project the corporate income tax base,

[9] NIPA corporate profits exclude bad debt expense because it is not considered an expense associated with current production. See Chapter 13 of the BEA's NIPA Handbook located at: https://www.bea.gov/resources/methodologies/nipa-handbook/pdf/chapter-13.pdf.

[10] Prior to Public Law 115-97, often referred to as the Tax Cuts and Jobs Act of 2017 (TCJA), domestic corporations were taxed only on domestic income, foreign income repatriated to the U.S., and certain types of foreign income included in domestic taxable income under Subpart F of the Internal Revenue Code. Following the TCJA, most dividends received by U.S. multinationals from their foreign affiliates are not taxed. However, several provisions introduced by the TCJA do impose new taxes on foreign profits, such as the Global Intangible Low Taxed Income (GILTI) regime, and the Base Erosion and Anti-Abuse Tax (BEAT).

CBO must therefore project a state and local tax (SALT) adjustment and subtract that value from projection of NIPA corporate profits.

4. **Pension-related deductions.** Corporations accrue pension expenses as employees earn benefits, even if no cash is contributed to the pension fund. Pension expenses are only deductible when corporations make actual cash contributions. In calculating NIPA corporate profits, BEA's adjustment to IRS TRLTD accounts for differences between cash- and accrual-based pension compensation and whether a plan is over- or under-funded. CBO's projection of the pension adjustment accounts for this difference by estimating the gap between pension costs included in NIPA corporate profits and the amounts deductible for tax purposes.

Our process for selecting these adjustments began by reviewing the full set of eighteen adjustments that CBO projects and applies to its projection of NIPA corporate profits before tax, with the goal of identifying those most likely to improve the accuracy of CBO's estimates by incorporating financial information. We selected a subset of adjustments based on three criteria: (1) economic significance, (e.g., the size, volatility and/or complexity), (2) conceptual alignment with firm-level accounting information,[11] and (3) public data availability (i.e., whether the necessary information could be obtained from the financial statements).

In addition to these four adjustments, we also examine whether financial statement data can help improve CBO's estimates of the split between profitable and loss-making corporations. The profit and loss split is important because only profitable corporations pay current income tax, so accurately estimating the share of profits versus losses is central to projecting tax

[11] For example, certain adjustments (e.g., disaster adjustments, statistics revisions) are driven by macroeconomic or statistical factors that cannot be evaluated using accounting information.

revenues. CBO highlights the complexity of estimating this split, suggesting this may be an area where financial statement information could be particularly informative.

Early each calendar year, CBO generates baseline projections for the current government fiscal year and the ten years that follow and updates those projections as new information becomes available.[12] At that time, an initial BEA estimate for NIPA corporate profits in the prior calendar year is available, but information on the adjustments needed to transform those profits to the corporate tax base will not be available for another one or two years. CBO estimates those adjustments for the prior year (referred to here as year *t*) and the projection period. We are interested in testing if data from financial reports from year *t* can improve CBO's estimates of those adjustments. To mirror CBO's process, we use only the macroeconomic information available to CBO in January of *t+1*, and evaluate outcomes using the final (revised) value for year *t*. This approach ensures our tests reflect the same constraints faced by CBO and allows us to test whether financial statement information provides incremental value at the time CBO produces its initial forecasts. In implementation, we enforce this timing using real-time datasets corresponding to each baseline year.

Because CBO's internal forecasting models have evolved over time, we do not attempt to replicate them directly. Instead, for each adjustment and the profit-loss split, we construct a simplified version of CBO's current approach ("*CBO Base Model"),* where applicable, and otherwise adapt our specification to reflect the underlying estimation process or mechanical constraints (e.g., for the foreign profits and state and local tax adjustments). To construct these base specifications, we draw on publicly available CBO publications (e.g., CBO 2023c) as well

[12] CBO typically publishes its initial baseline estimate in January of each year, although there have been instances of a February release. The baseline estimate has been published as late as April in 2018 and May in 2022.

as institutional knowledge of CBO's forecasting process.[13] Using a consistent specification across the full sample ensures comparability over time while approximating key features of CBO's process. Our approach captures the key economic drivers of each adjustment and provides a practical way to test whether financial statement data improves forecast accuracy.

In implementing this approach, we also consider the timing of data availability. We obtain CBO macroeconomic variables and baseline inputs from historical releases of CBO's *Historical Data and Economic Projections*, and financial statement data from Compustat.[14] The availability of the macroeconomic data used to forecast the four adjustments varies. Pension information becomes available in year *t+1*. IRS corporate tax return data needed for the profit and loss split are not available until year *t+2*. Similarly, bad debt deductions are not final until year *t+2*. Thus, the data used by CBO for a given year's baseline forecast can be up to two years old. By contrast, initial BEA estimates of foreign profits and state and local taxes are available much sooner, almost in real time during year *t*.[15] The availability of other macroeconomic parameters, like NIPA corporate profits and GDP, also varies.

In contrast, financial statement information is available on a timelier basis. Firms must file Form 10-Ks with the SEC shortly after year-end, allowing CBO the opportunity to incorporate year *t* activity reflected on financial statements into their baseline forecast process that also begins shortly after year end.[16] For each adjustment, we build on the *CBO Base Model*

[13] Two coauthors are affiliated with the CBO and have direct experience with its corporate income tax forecasting process and related public documentation.
[14] CBO's *Historical Data and Economic Projections* datasets are available here: https://www.cbo.gov/data/budget-economic-data#11.
[15] Even in cases where partial information from BEA is available for year *t*, revisions to this data continue to occur as more information becomes available and as BEA revises its methodologies.
[16] Firms with public float of $700 million or more have a 60-day filing deadline, firms with public float between $75 and $700 million have a 75-day filing deadline, and firms with public float below $75 million have a 90-day filing deadline. Consider an anchor estimation year *t* = 2012, which corresponds to the 2012 adjustments and profit/loss split as released in the January 2013 baseline estimate. As of January 2013, the most recent estimate of NIPA

by adding conceptually appropriate financial statement variables. Following Green et al. (2022), we first add aggregate financial statement pre-tax income (*PTI*) and aggregate book-tax differences (*BTDs*), which provide timely proxies for taxable income and have been shown to improve estimates of future taxable income. We then add other aggregate financial statement variables tailored to each adjustment and to the profit and loss split. These variables are created by aggregating firm-level data from Compustat without sample restriction or adjustment and represent the total dollar amounts reported each year by publicly traded corporations. Accordingly, our analysis is conducted at the aggregate (year) level and is structured as a time series. Although public corporations represent a subset of the corporate sector, they account for most of the taxable income, and income tax after credits. For example, in 2022, firms with assets over $2.5 billion (i.e., publicly traded corporations) generated 83.4% of aggregate corporate taxable income and 79.9% of aggregate corporate income tax after credits.[17]

We evaluate the ability of aggregated financial statement variables to reduce errors in the *CBO Base Model* used to project each adjustment, or the corresponding specifications for adjustments that do not use a base model, using both in-sample and out-of-sample analyses. The in-sample analysis allows us to understand historical relationships among the forecasting parameters and between financial statement information and CBO's actual adjustments. The in-sample analysis uses data as of the May 2022 *Historical Data and Economic Projections* released by CBO. The sample period begins with the earliest year for which CBO final estimates are available and ends in 2022.

corporate profits available is of 2011 corporate profits included in the July 2012 BEA release, but 2012 financial statement profit/loss is available for a large cross-section of public corporations.

[17] See Figure A in https://www.irs.gov/pub/irs-pdf/p16.pdf.

The out-of-sample analysis uses an expanding window forecast procedure. For each forecast year, we estimate the model with all available prior data and apply the estimated parameters to the subsequent year's data to forecast an adjustment. The estimation window is then expanded one year at a time, and this process is repeated through 2022. Each out-of-sample forecast uses only the information available to CBO at the time, based on the CBO's *Historical Data and Economic Projections* from the corresponding baseline year. Accordingly, the estimation window reflects data availability and may differ across adjustments. For example, to generate the 2012 forecast, we use the January 2012 baseline and the corresponding historical data available at that time. As a result, we use a separate real-time data set for each forecast year, rather than relying on finalized values, to ensure our approach is consistent with and comparable to CBO's process.

We evaluate model performance and base our conclusions on out-of-sample forecast accuracy. We assess forecast accuracy by comparing the root mean squared error (RMSE) of our base specification with and without financial statement variables in expanding window forecast tests. We also report the adjusted R^2 values from our in-sample analysis as a descriptive benchmark to characterize model fit, rather than as a measure of predictive performance.

Because our specifications may differ from CBO's actual forecasting models in a given year, better accuracy relative to our base specification does not necessarily imply a similar improvement to CBO's actual forecasts. The purpose of these baseline specifications is not to replicate or outperform CBO's internal models, but rather to provide a consistent and comparable framework for evaluating whether financial statement information has incremental predictive value. We compare specifications with and without financial statement information to isolate its potential contribution. Accordingly, comparisons to CBO's actual forecasts are provided only

where feasible as supplemental evidence. Table 1 reports descriptive statistics for the data used in our analyses and are intended solely to provide context for the scale and variation in the data. The table is based on the in-sample dataset constructed using CBO's May 2022 baseline and therefore reflects finalized values.[18] The variables reported in Table 1 are described in detail in the following section.

IV. APPLYING FINANCIAL STATEMENT DATA TO CBO ADJUSTMENTS

In the following sections we describe the methodology applied to each adjustment and to the profit and loss split and begin with descriptive in-sample results to provide context. We then present the out-of-sample results, which form the basis for our conclusions.

Bad Debt Expense Adjustment

We model the following simplified version of CBO's current approach for the bad debt adjustment (the "*CBO Base Model"* for bad debts) and estimate it using OLS:

$$BadDebtAdjustment_t = \alpha_0 + \beta_1 GDPGap_t + \beta_2 CorpProfits_t + \varepsilon_t \quad (1)$$

BadDebtAdjustment is CBO's final adjustment for aggregate bad debt expense for year *t.* The difference between nominal GDP and CBO's estimate of potential GDP (*GDPGap*) and the level of corporate profits (*CorpProfits*) capture the macroeconomic factors CBO currently considers in estimating this adjustment (see Appendix for all variable definitions).

We modify equation (1) for the bad debt adjustment in two steps. First, we add aggregate pre-tax income (*PTI*) and aggregate book-tax differences (*BTDs*), which represent timely aggregate measures of corporate economic activity and the gap between financial reporting and

[18] We do not report comparable descriptive statistics for the out-of-sample analysis because those forecasts are constructed using real-time data. Each forecast relies on a different vintage of the CBO's *Historical Data and Economic Projections* corresponding to the baseline year, so there is no single dataset to summarize.

taxable income (Green et al. 2022). Second, we introduce the following financial statement items directly related to accounts receivable and/or the related bad debt expense:

1. Aggregate estimate for doubtful accounts (*EstDA*), a proxy for expected uncollectible receivables, with larger values indicating larger future bad debt deductions.
2. Aggregate total accounts receivable (*Tot A/R*), where larger balances indicate larger potential future bad debt deductions.
3. Net receivables (*Net A/R*), where larger balances, holding *Tot A/R* constant, indicate fewer bad debt deductions.
4. Changes in accounts receivable ($\Delta A/R$), where larger increases indicate larger potential future bad debt deductions.

The in-sample estimation period spans 1986-2022 (1987-2022 when *EstDA* is included, due to data availability in Compustat). The expanding window estimation sample used to estimate out-of-sample forecasts begins with an estimation period of 1986-2011 to generate coefficients for the 2012 forecast. Estimation errors are calculated as the difference between the model's predicted adjustment and the final realized value, with additional comparisons made to CBO's initial year *t* baseline estimate of the bad debt expense adjustment.

Panel A of Figure 3 reports in-sample model fit using adjusted R^2. Adding PTI and BTDs improves explanatory power relative to the *CBO Base Model*, with the adjusted R^2 increasing from 0.376 to 0.563. Incorporating the aggregate estimate for doubtful accounts (*EstDA*) alongside *PTI* and BTDs further improves model fit, with adjusted R^2 rising to 0.796. Including additional financial statement variables yields only modest incremental improvements. The full specification produces the highest adjusted R^2 of 0.801, indicating that most of the in-sample

explanatory power is captured by *PTI*, *BTDs* and *EstDA*, with limited incremental contribution from the other variables.

Panel B of Figure 3 plots out-of-sample forecast accuracy measured using RMSE. Because CBO changed its methodology for this adjustment in 2019, our estimates are not directly comparable to CBO's actual forecasts. Accordingly, Panel B focuses on comparisons between the *CBO Base Model* and specifications that incorporate financial statement data. In contrast to the in-sample results, adding *PTI* and *BTDs* reduces forecast accuracy relative to the *CBO Base Model*, with RMSE increasing from 83.41 to 100.14. Incorporating the aggregate estimate for doubtful accounts (*EstDA*) substantially improves forecast accuracy, reducing RMSE to 61.41. This specification delivers the largest improvement, reducing RMSE by approximately 26 percent relative to the *CBO Base Model*. While additional financial statement variables improve the accuracy relative to the *CBO Base Model*, the gains relative to the *EstDA* specification are smaller.

Foreign Profits Adjustment

There is no *CBO Base Model* for the foreign profits' adjustment. CBO estimates the foreign profits adjustment as a function of the BEA's initial estimate of the foreign profits of U.S. corporations and constrains the coefficient on that estimate to be equal to one. To operationalize this constraint, we construct *ForeignProfitsAdjustment* as the difference between BEA's final and initial estimates of foreign profits.

BEA publishes quarterly estimates of U.S. corporations' foreign profits, with initial estimates for year *t* available by early year *t+1*.[19] Although these data are relatively timely, it is

[19] For later years in the projection period, CBO estimates the foreign profits adjustment as a function of the historical growth rate of U.S. foreign direct investment and portfolio equity, adjusted for changes in valuations using growth in the S&P 500 (CBO 2023). CBO uses a similar process to project the U.S. profits of foreign corporations.

often revised later based on new or revised information received by BEA. As a result, timely financial statement data may still help improve the accuracy of CBO's foreign profits adjustment. We begin by estimating BEA errors as a function of *PTI* and *BTDs:*

$$ForeignProfitsAdjustment_t = \alpha_0 + \beta_1 PTI_t + \beta_2 BTDs_t + \varepsilon_t \quad (2)$$

We expand equation (2) in two ways:

1. We include financial statement data on the geographic location of income by decomposing *PTI* into its domestic (*PIDOM*) and foreign (*PIFO*) components.
2. We include the proportion of foreign pre-tax income to total pre-tax income (*PIFO%*) to capture the relative magnitude of aggregate foreign income.

Holding total pre-tax income constant, greater levels of foreign income, or a larger share of foreign to total income, should indicate larger foreign profits adjustments. Historic initial estimates of foreign profits are available beginning in 2003, so the in-sample period covers 2003-2022. Out-of-sample forecasts are generated for years 2012-2022 using an expanding window that begins with a 2003-2011 estimation window. Because CBO relies on BEA's initial estimate of foreign profits, there is no corresponding CBO estimate for this adjustment. Instead, we evaluate how well each specification predicts revisions to BEA's estimates.

Panel A of Figure 4 reports in-sample model fit using adjusted R^2. Overall, the models exhibit limited explanatory power for explaining BEA errors. Adding *PTI* and *BTDs* results in an adjusted R^2 of 0.077. Replacing *PTI* with its domestic and foreign components (*PIDOM* and *PIFO*) reduces model fit, with the adjusted R^2 declining to 0.022. Including the share of foreign income (*PIFO%*) alongside *PTI* and *BTDs* does not improve the fit relative to the base model.

Panel B of Figure 4 plots out-of-sample forecast accuracy measured using RMSE. Relative to BEA, all specifications that incorporate financial statement data improve forecast

accuracy. The model that includes *PTI* and *BTDs* reduces RMSE from 29.92 to 14.65, representing a 51 percent reduction in forecast error relative to BEA. Expanding the model to include additional financial statement variables yields modest changes in accuracy, with RMSEs of 16.67 and 16.35 for the PIDOM/PIFO and PIFO% specifications, respectively.

We also examine forecast accuracy before and after the implementation of the Tax Cuts and Jobs Act of 2017 (TCJA), which shifted the U.S. towards a quasi-territorial system and changed how foreign income is reflected in the corporate tax base. Because BEA's measure of corporate profits includes the worldwide income of U.S. firms, while the tax base includes only certain types of foreign income, this change affects how foreign profits are reflected in taxable income, and in turn, the adjustment. In untabulated results, we find that BEA forecast errors declined in the post-TCJA period (RMSE = 24.25 compared to 33.94 pre-TJCA). Models incorporating financial statement variables continue to outperform BEA in both periods. The *PTI* and *BTD* specification performs the best post-TCJA (RMSE = 14.65; pre-TCJA RMSE =16.48), while the specification that splits *PTI* into its domestic (*PIDOM*) and foreign (*PIFO*) components performs slightly better pre-TCJA (RMSE = 15.79).[20] Overall, financial statement variables, particularly *PTI* and *BTDs*, improve the estimate of BEA forecast errors, with limited incremental improvements from additional financial statement variables. These improvements remain post-TCJA, however, they are less pronounced as BEA forecasts improve.

State and Local Tax (SALT) Adjustment

[20] In untabulated results, we examine accuracy before and after the TCJA for the remaining adjustments. While we observe some changes across periods, these patterns are not consistent. For example, for the SALT adjustment, accuracy generally improves for the financial statement specifications post-TCJA, while BEA's accuracy declines sharply, resulting in lower RMSEs for all the financial statement models relative to BEA revisions. However, not all specifications improve; in particular, the specification incorporating deferred taxes performs worse in the post-TCJA period. In contrast, results for pensions, bad debt adjustments and the profit and loss split show no systematic improvement in the relative performance of the financial statement models.

Like the foreign profits adjustment, there is also no *CBO Base Model* for the SALT adjustment. CBO estimates the SALT adjustment as a function of the BEA's initial estimate of state and local taxes and constrains the coefficient on that estimate to be equal to one. To operationalize this constraint, we construct *SALTAdjustment* as the difference between BEA's final and initial estimates of state and local taxes. Like its foreign profits estimates, BEA's SALT deduction estimates are released on an almost real-time basis. However, because these initial estimates are often revised later, we examine whether adding certain financial statement variables improves the accuracy of the adjustment. We therefore begin by estimating BEA errors as a function of *PTI* and *BTDs*:

$$SALTAdjustment_t = \alpha_0 + \beta_1 PTI_t + \beta_2 BTDs_t + \varepsilon_t \quad (3)$$

We expand equation (3) by adding the following aggregated financial statement information related to state and local income taxes:

1. Current state and local tax expense (*TXS*), which provides an estimate the deduction corporations can claim in the current year, and
2. Deferred state and local tax expense (*TXDS*), which provides an estimate of future net tax deductions or payments.

The in-sample estimation period runs from 2003, the first year that initial estimates of state and local taxes are available in the BEA archive, through 2022. Out-of-sample forecasts are generated using an expanding window estimation procedure beginning with a 2003-2011 estimation window to produce the 2012 forecast and then adding one year of data at a time to generate each subsequent forecast. As with foreign profits, we evaluate how well each specification predicts revisions to BEA's estimates.

Panel A of Figure 5 reports in-sample model fit using adjusted R^2. Using *PTI* and *BTD* to forecast BEA errors results in limited explanatory power with an adjusted R^2 of 0.120. Incorporating current state and local taxes (*TXS*) substantially improves the model's fit, increasing the adjusted R^2 to 0.395, but the addition of deferred state and local taxes (*TXDS*) provides little additional improvement, with an adjusted R^2 of 0.383.

Panel B of Figure 5 plots out-of-sample forecast accuracy measured using RMSE. Incorporating financial statement variables into the forecast of the SALT adjustment improves accuracy relative to BEA. The model that includes *PTI* and *BTDs* reduces RMSE from 11.88 to 8.38, a 29 percent reduction. However, adding adjustment-specific variables yields mixed results. Including *TXS* increases the RMSE to 10.72, while adding both *TXS* and *TXDS* further reduces accuracy, with RMSE rising to 16.21. These results suggest that while financial statement variables can improve the forecast of BEA revisions, the gains are concentrated in parsimonious specifications, with additional variables reducing forecast accuracy.

Pension Adjustment

We model the following simplified version of CBO's current approach for the pension adjustment (the "*CBO Base Model"* for pensions) and estimate it using OLS:

$$PensionAdjustment_t = \alpha_0 + \beta_1 PensionAdjustment_{t-1} + \beta_2 10yrAvgPension + \varepsilon_t \qquad (4)$$

PensionAdjustment is CBO's final adjustment for the employer expenses related to pensions for year *t.* CBO's current approach relies on both the prior year's pension adjustment ($PensionAdjustment_{t-1}$) and the long-term average of its historical pension adjustments to estimate this value. Consistent with CBO's approach, we use a ten-year rolling average (*10yAvgPensionAdj)* to capture historical adjustments, which reflect the difference between pension expenses included in NIPA corporate profits and those included in the corporate tax

base. Since 2012, several legislative changes have also affected how deductible pension costs are calculated. Thus, the historical data for the adjustment reflect both policy changes and broader economic conditions.

We modify equation (4) for the pension adjustment as follows. First, we add *PTI* and *BTDs.* We then incorporate three pension-specific financial statement variables:

1. Employer contributions to pension plans (*Contrib*), which approximate actual aggregate pension deductions.
2. Funded status (*Funded Status*), which reflects cumulative contributions already made to the pension plan. As such, *Funded Status* captures the cumulative deductions already claimed by corporations. Higher values suggest fewer contributions will be needed in the future, and therefore, lower future deductions.
3. An estimated pension related book-tax difference (*EstPensionBTD*) based on financial statement data, which provides another estimate of future pension contributions.

Corporations publicly disclose extensive pension plan information. During model development, we considered eighteen pension-related variables because of their potential to provide information about tax-deductions related to pensions and post-retirement benefits. From these, we selected the three variables described above based on their conceptual relevance, data availability, and a preliminary (untabulated) analysis of model fit. The in-sample analysis begins in 1997 and ends in 2022 so that the ten-year rolling average is defined and because of data limitations for some Compustat variables. Out-of-sample forecasts are generated for 2014-2022 using the expanding window estimation procedure. We begin with a 1997-2013 estimation window to generate the 2014 forecast (the first year for which historic CBO forecasts of the

pension adjustment are available) and then add one year of data at a time to generate each subsequent forecast (e.g., 1997-2014 to estimate the 2015 adjustment).

Panel A of Figure 6 reports in-sample model fit using adjusted R^2. We observe that including *PTI* and *BTDs* slightly reduces explanatory power relative to the *CBO Base Model* for the pension adjustment (adjusted R^2 falls from 0.219 to 0.188). Adding employer contributions (*Contrib*) alongside *PTI* and *BTDs* increases the adjusted R^2 to 0.426. Removing *PTI* and *BTDs* further improves fit; the specification that includes only employer contributions yields the highest adjusted R^2 of 0.458.

However, Panel B shows that these in-sample improvements do not always translate into better out-of-sample performance. Including *Contrib*, *PTI* and *BTDs* reduce forecast accuracy relative to the *CBO Base Model.* By contrast, specifications that only include employer contributions (*Contrib only*) or the estimated pension book–tax difference (*EstPensionBTD only*) do improve forecast accuracy, with RMSEs of 25.83 and 27.38, respectively, compared to 30.14 for the *CBO Base Model.* These results suggest that while broader financial statement measures do not improve forecast accuracy for this adjustment, more targeted pension-specific variables, particularly employer contributions, can provide incremental predictive value.

Profit and Loss Split

After estimating all adjustments to arrive at an estimate of aggregate net corporate taxable income, CBO separates its estimates into aggregate positive and aggregate negative amounts. To do this, CBO first projects aggregate positive corporate income (*PosCorpNI*) based on five variables: 1) its prior value ($PosCorpNI_{t-1}$), 2) Aggregate C-corp net income subject to tax, based on IRS Statistics of Income (SOI) data through year *t-2* and CBO's projections for later years (*CCorpNI*), 3) GDP, 4) a measure of tax depreciation (*TaxDepr*) from the NIPA

tables through *year t-1* and CBO's projections for later years (CBO 2023c), and (5) an indicator variable for years after 2018 to capture the effect of the TCJA (*TCJA*), which is also interacted with *CCorpNI.* All continuous variables are scaled by potential GDP.

Similarly, we model the following simplified version of CBO's current approach for the profit and loss split (the "*CBO Base Model"* for the positive corporate income) and estimate it using OLS:

$$PosCorpNI_t = \alpha_0 + \beta_1 PosCorpNI_{t-1} + \beta_2 CCorpNI_t + \beta_3 GDP_t + \beta_4\ TaxDepr_t + \beta_5 TCJA + \beta_6 TCJA*CCorpNI_t + \varepsilon_t \quad (5)$$

Next, we modify equation (5) by adding *PTI* and *BTDs,* both scaled by potential GDP. Following prior research, we then separate *PTI* into its accrual (*PTACC*) and cash (*PTCASH*) components alongside *BTDs,* because accruals and cash flows have been shown to provide useful information for predicting taxable income (Green et al. 2022).

The in-sample analysis for each covers a sample period spanning 1986-2022. Out-of-sample forecasts are generated for 2012-2022 using an expanding window estimation procedure. To reflect data availability, model estimation is limited to data on actuals through year $t-2$. For example, we begin with a 1986-2010 estimation window to generate coefficients for the 2012 forecast and then add one year of data to generate each subsequent forecast (e.g., 1986-2011 to estimate 2013).

Panel A of Figure 7 shows that the *CBO Base Model* already explains a large share of the variation in positive corporate net income, with an adjusted R^2 of 0.924. Adding *PTI* and *BTDs* modestly increases the adjusted R^2 to 0.953, and decomposing *PTI* into pretax accruals (*PTACC*) and pretax cash flows (*PTCASH*) produces a similar adjusted R^2 of 0.953.

However, these improvements in in-sample fit do not translate into better out-of-sample performance. Panel B of Figure 7 shows that the *CBO Base Model* yields the lowest RMSE (0.027), while adding *PTI* and *BTDs* increases the RMSE to 0.036. Expanding the model to include *PTACC, PTCASH,* and *BTDs* worsens out-of-sample performance, with the RMSE increasing to 0.056. Overall, financial statement information provides limited incremental benefit for forecasting positive corporate net income.

VI. IMPLICATIONS

Our study highlights the role that financial reporting data can play in improving the methodology underlying government revenue forecasts. Because policy decisions rely on these forecasts, errors can have important consequences. Examining CBO's forecasting process provides insight into when and how financial statement information is most useful. We find that improvements in forecast accuracy are not uniform across settings and depend not just on whether financial statement data are used, but on which variables are included and how they are specified. In some cases, summary measures of financial statement profitability provide relevant information, while in others, variables more closely aligned with the underlying adjustment provide incremental value. At the same time, more complex specifications with numerous financial statement variables do not consistently improve performance, highlighting the importance of parsimony in model design. Understanding which financial statement variables matter, and in which settings, can help agencies generate more reliable estimates, leading to better-informed policy decisions.

The implications of our study extend beyond the CBO context. Private sector forecasters and policy analysts could also benefit from incorporating financial statement data when evaluating corporate income tax collections or modeling related economic outcomes. More

broadly, our results show that the accounting information environment influences not only firm-level decisions, but also how key inputs into fiscal policy, such as the corporate tax base, are measured. At the same time, the varied performance across adjustments, particularly the lack of improvement in the profit and loss split, highlights that these data are not equally informative and must be used selectively.

Finally, while our analysis demonstrates the potential to improve near-term forecasts using timely financial statement information, we do not evaluate its usefulness for improving longer-term projections, such as the 10-year horizon used by CBO. This reflects the structure of our empirical design, which relies on information available at the time of the baseline forecast. Future research should explore whether financial statement information improves longer-term forecasts, particularly during periods of economic disruption or major tax changes.

REFERENCES

Auerbach, A. 1999. On the performance and use of government revenue forecasts. *National Tax Journal* 52 (4): 615-853.

Bureau of Economic Analysis. 2020. Chapter 13: Corporate Profits. Available: https://www.bea.gov/resources/methodologies/nipa-handbook/pdf/chapter-13.pdf

Burman, L., B. Page, and D. Weiner. 2022. The implications of uncertain economic paths for revenue projections. *National Tax Journal* 75 (4): 655-846.

Center for Audit Quality. 2024. Financial restatement trends in the United States: 2013 – 2022. Available: https://thecaq.wpenginepowered.com/wp-content/uploads/2024/06/caq-financial-restatement-trends-us-2013-2022_2024-06.pdf

Congressional Budget Office. 2023a. The accuracy of CBO's budget projections for fiscal year 2022, (January) Available: https://www.cbo.gov/system/files/2023-01/58603-Accuracy.pdf

Congressional Budget Office. 2023b. CBO explains how it develops the budget baseline (April) Available: https://www.cbo.gov/system/files/2023-04/58916.pdf

Congressional Budget Office. 2023c. How CBO projects corporate income tax receipts (October). Available: https://www.cbo.gov/system/files/2023-10/59436-Corporate-Tax-Revenues.pdf

Gleason, C., Jenkins, N., and Johnson, W. 2008. The contagion effects of accounting restatements. *The Accounting Review 83* (1): 83-110.

Green, D., E. Henry, S. Parsons, and G. Plesko. 2022. Incorporating financial statement Information to Improv Forecasts of Corporate Taxable Income. *The Accounting Review*, 97 (7): 169-192.

Hann, R., C. Li. And M. Ogneva. 2021. Another look at the macroeconomic content of aggregate earnings: Evidence from the labor market. *The Accounting Review* 96 (2): 365-390.

Joos, P., and G. Plesko. 2005. Valuing loss firms. *The Accounting Review* 80 (3): 847-870.

Klein, A., and C. Marquardt. 2006. Fundamentals of accounting losses. *The Accounting Review* 81(1): 179-206.

Konchitchki, Y., and P. Patatoukas. 2014a. Accounting earnings and gross domestic product. *Journal of Accounting and Economics* 57 (1): 76-88.

Li, K. 2011. How well do investors understand loss persistence? *Review of Accounting Studies* 16 (3): 630-667.

Plesko, G. 1988. The accuracy of government forecasts and budget projections. *National Tax Journal* 41 (4): 483-501.

Schrand, C. 2019. Impediments to relevant research: The journal review and publication process. *Accounting Horizons* 33 (2): 11-16.

Shivkumar, L. 2007. Aggregate earnings, stock market returns and macroeconomic activity: A discussion of "does earnings guidance affect market returns? The nature and information content of aggregate earnings guidance." *Journal of Accounting and Economics* 44 (1-2): 64-73.

Welsch, A., B. Williams, and L. Mills. 2024. Do accounting earnings provide useful information for state tax revenue forecasts? *Review of Accounting Studies* 30: 813-859.

TABLE 1 - Descriptive Statistics

Adjustment	Variable Source	N	Mean	Std. Dev.	Median
Bad Debt Adjustment					
BadDebtAdjustment	CBO	36	135.29	70.68	122.30
GDPGap	CBO	36	-0.01	0.02	-0.01
CorporateProfits	CBO	36	1,345.26	753.10	1,287.60
EstDA	Financial Statements	36	148.55	76.84	151.21
TotalA/R	Financial Statements	36	23,383.33	14,007.18	24,610.78
NetA/R	Financial Statements	36	143.60	67.96	171.53
ΔA/R	Financial Statements	36	-197.79	196.12	-169.40
Foreign Profits Adjustment					
ForeignProfitsAdjustment	CBO	20	18.95	23.93	10.85
PIDOM	Financial Statements	20	578.75	231.82	574.97
PIFO	Financial Statements	20	580.30	143.01	607.74
PIFO%	Financial Statements	20	0.52	0.10	0.51
SALT Adjustment					
SALTAdjustment	CBO	20	-1.81	13.69	-2.00
TXS	Financial Statements	20	28.52	7.57	26.61
TXDS	Financial Statements	20	-1.76	3.72	-1.18
Pension Adjustment					
PensionAdjustment	CBO	26	1.15	23.74	3.70
$PensionAdjustment_{t-1}$	CBO	26	1.03	23.64	3.70
10yrAvePensionAdj	CBO	26	5.09	13.94	5.66
Contrib	Financial Statements	26	93.68	46.68	105.85
FundedStatus	Financial Statements	26	-365.40	383.09	-421.76
EstPensionBTD	Financial Statements	26	74.94	38.72	58.84

Profit and Loss Split					
PosCorpNI	CBO	35	0.08	0.01	0.08
PosCorpNI$_{t-1}$	CBO	35	0.08	0.01	0.08
CCorpNI	CBO	35	0.06	0.02	0.06
GDP	CBO	35	0.99	0.02	0.99
TaxDepr	CBO	35	0.08	0.01	0.08
TCJA	Time period indicator	35	0.09	0.28	0.00
PTI/EstGDP	Financial Statements	35	0.13	0.04	0.13
BTD/EstGDP	Financial Statements	35	0.01	0.02	0.01
PTACC	Financial Statements	35	-0.09	0.08	-0.06
PTCASH	Financial Statements	35	0.21	0.09	0.22
All Adjustments					
PTI	Financial Statements	36	1,817.43	1,118.55	1,709.34
BTD	Financial Statements	36	194.29	321.47	128.47

Table 1 presents descriptive statistics for the variables used in the in-sample analysis for each adjustment and for the profit and loss split. The in-sample analysis is based on data and economic projections from the CBO's May 2022 baseline and therefore reflects finalized values. All variables are defined in the Appendix. The "Variable Source" column indicates whether a variable is part of the CBO's existing forecasting process ("CBO") or is derived from aggregated financial statement data ("Financial Statements"). Financial statement variables are constructed by aggregating firm-level data. *TCJA* is an indicator variable that identifies the post-TCJA period and is therefore not associated with a specific data source.

FIGURE 1

CBO's Model of Corporate Income Tax Revenues

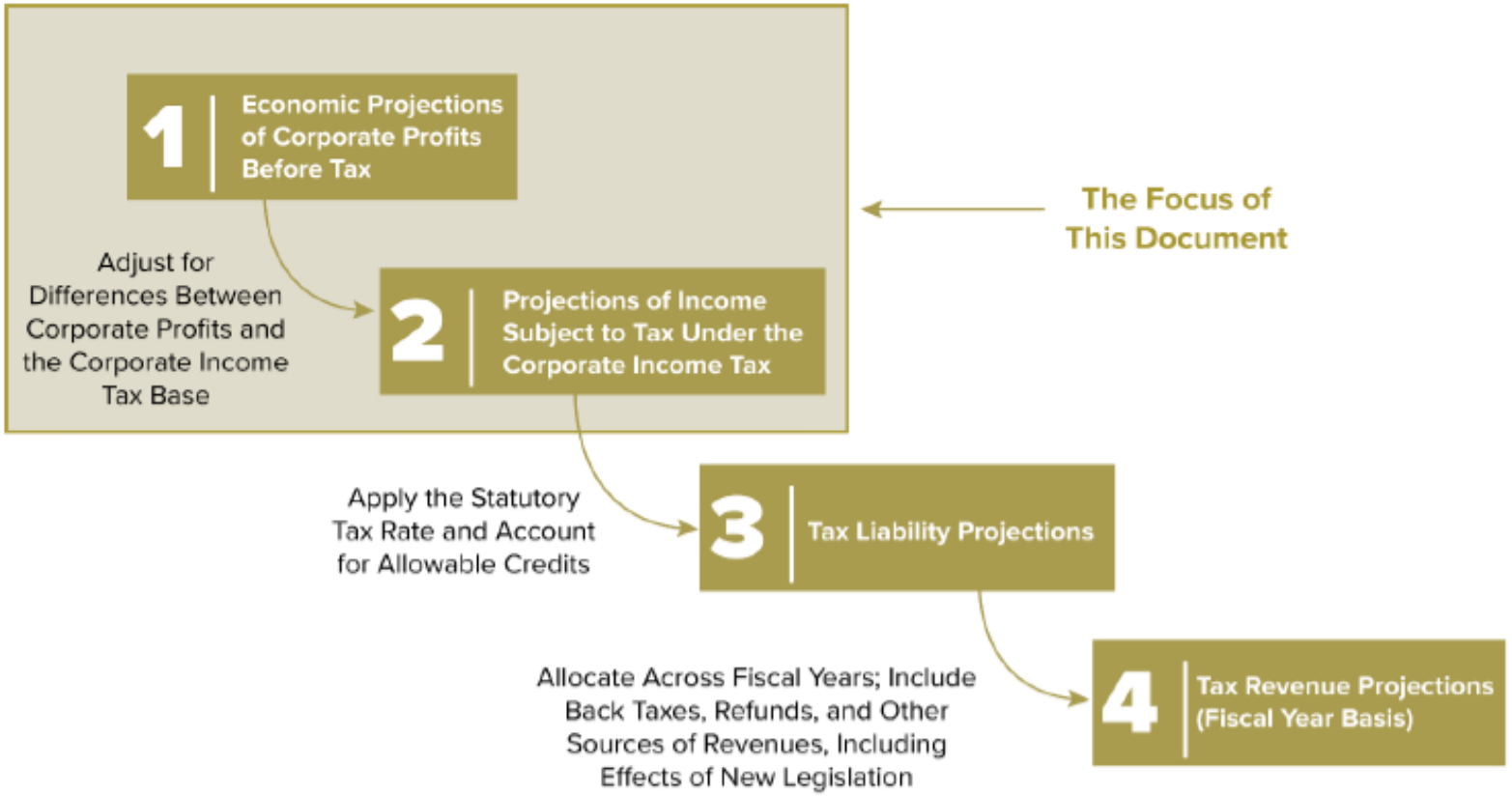

Figure 1 describes the four stages of CBO's model of corporate income tax revenues. We focus on the process between Stages 1 and 2: adjusting for differences between corporate profits and the corporate income tax base. Source: CBO (2023c).

FIGURE 2

The Timing of Economic and Tax Return Information Relative to the Projection of Fiscal Year Receipts

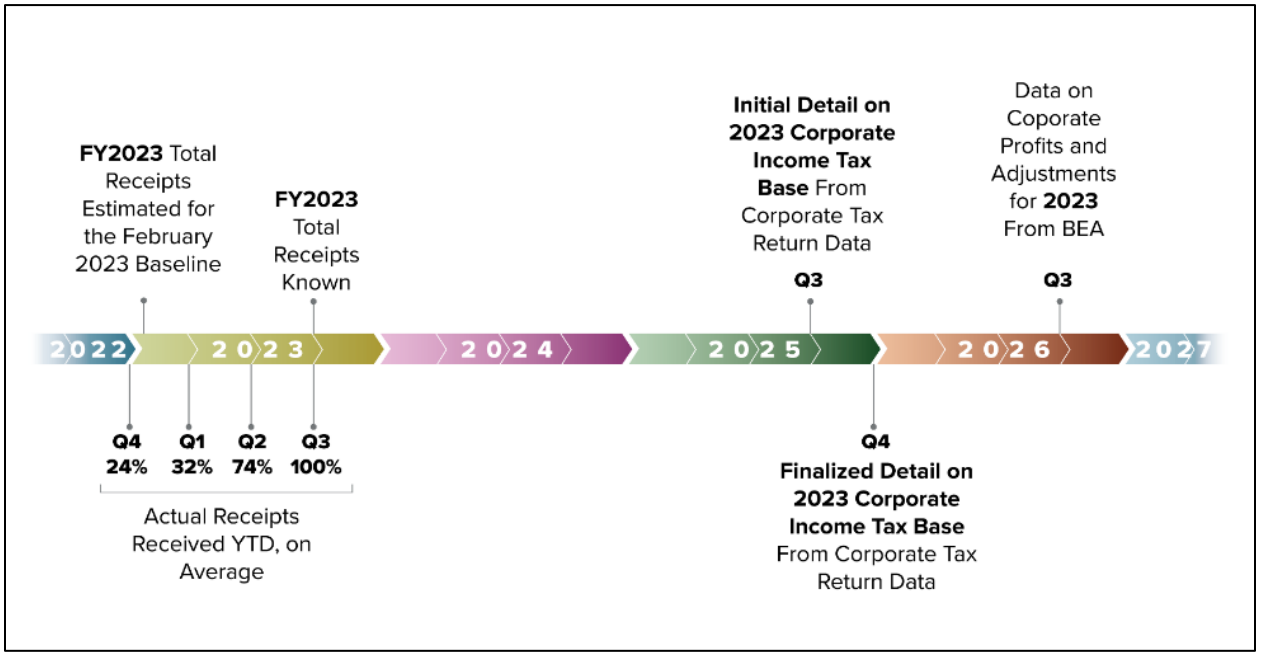

Figure 2 illustrates the gap between CBO's final projections of fiscal year receipts and the availability of economic and tax data from BEA and the IRS. The figure illustrates that final information on the 2023 corporate income tax base will not be available until late in calendar year 2026. Source: CBO (2023c).

FIGURE 3
Bad Debt Adjustment: In-Sample Fit and Out-of-Sample Forecast Accuracy

Panel A: In-Sample Model Fit (Adjusted R^2) for the Sample Period, 1986 – 2022

CBO Base Model	*+PTI, BTDs*	*+PTI, BTDs, EstDA*	*+PTI, BTDs, EstDA, TotalA/R*	*+PTI, BTDs, EstDA, TotalA/R, NetA/R*	*+PTI, BTDs, EstDA, TotalA/R, NetA/R, ΔA/R*
0.376	0.563	0.796	0.789	0.786	0.801

Panel B: Out-of-Sample Root Mean Squared Error (RMSE)

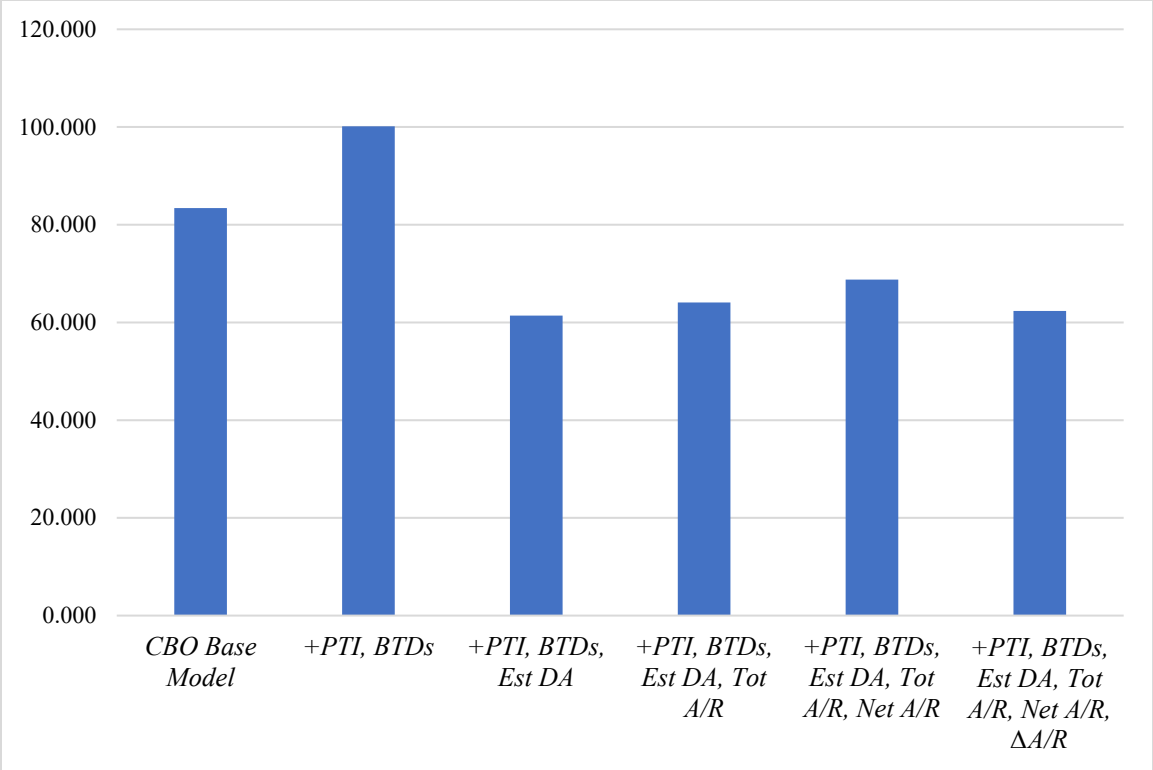

Figure 3 presents in-sample model fit and out-of-sample forecast accuracy for the bad debt adjustment. Panel A reports adjusted R^2 from the in-sample analysis over the 1986–2022 period (1987-2022 when *EstDA* is included) and is intended to assess model fit. Panel A starts with the *CBO Base Model* for bad debts: $BadDebtAdjustment_t = \alpha_0 + \beta_1 GDPGap_t + \beta_2 CorpProfits_t + \varepsilon_t$. Additional specifications incorporate financial statement variables. Variable definitions are in the Appendix. Panel B plots out-of-sample forecast accuracy, measured using RMSE, based on expanding window forecasts over the 2012–2022 period. Because CBO changed its methodology for this adjustment in 2019, our estimates are not directly comparable to CBO's actual forecasts over this period; accordingly, Panel B focuses on comparisons between the *CBO Base Model* and specifications that incorporate financial statement data.

FIGURE 4
Foreign Profits Adjustment: In-Sample Fit and Out-of-Sample Forecast Accuracy

Panel A: In-Sample Model Fit (Adjusted R^2) for the Sample Period, 2003– 2022

+PTI, BTDs	*+PIDOM, PIFO, BTDs*	*+PTI, BTDs, PIFO%*
0.077	0.022	0.028

Panel B: Out-of-Sample Root Mean Squared Error (RMSE)

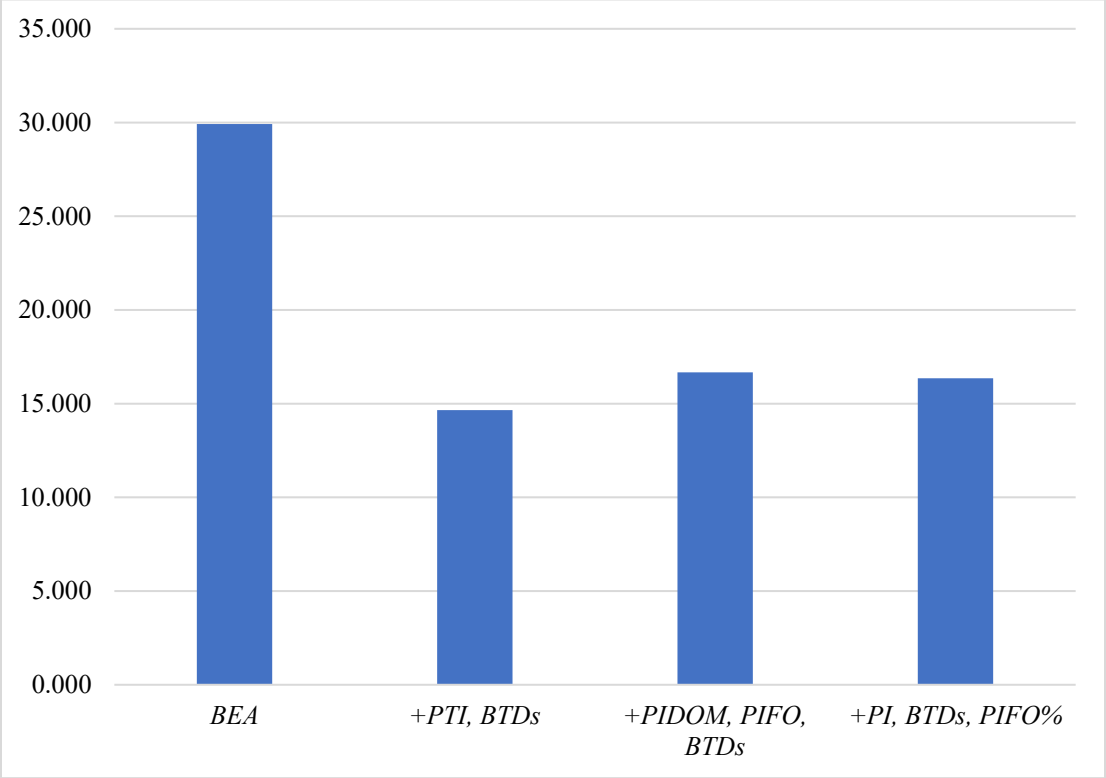

Figure 4 presents in-sample model fit and out-of-sample forecast accuracy for the foreign profits adjustment. Panel A reports adjusted R^2 from the in-sample analysis over the 2003–2022 period and is intended to assess model fit. There is no *CBO Base* Model for foreign profits because CBO relies on BEA's initial estimate of foreign profits. Accordingly, Panel A starts with the following model: $ForeignProfitsAdjustment_t = \alpha_0 + \beta_1 PTI_t + \beta_2 BTDs_t + \varepsilon_t$. Variables are defined in the Appendix. Panel B plots out-of-sample forecast accuracy, measured using RMSE, based on expanding window forecasts over the 2012–2022 period. Because CBO relies on the BEA's initial estimate of foreign profits, there is no direct comparison to CBO's published forecasts for this adjustment. Instead, "BEA" in Panel B captures revisions to BEA estimates, defined as the difference between final and initial values. The RMSE therefore reflects the ability of each specification to predict these revisions.

FIGURE 5
SALT Adjustment: In-Sample Fit and Out-of-Sample Forecast Accuracy

Panel A: In-Sample Model Fit (Adjusted R^2) for the Sample Period, 2003– 2022

+PTI, BTDs	*+PTI, BTDs,TXS*	*+PTI, BTDs,TXS, TXDS*
0.120	0.395	0.383

Panel B: Out-of-Sample Root Mean Squared Error (RMSE)

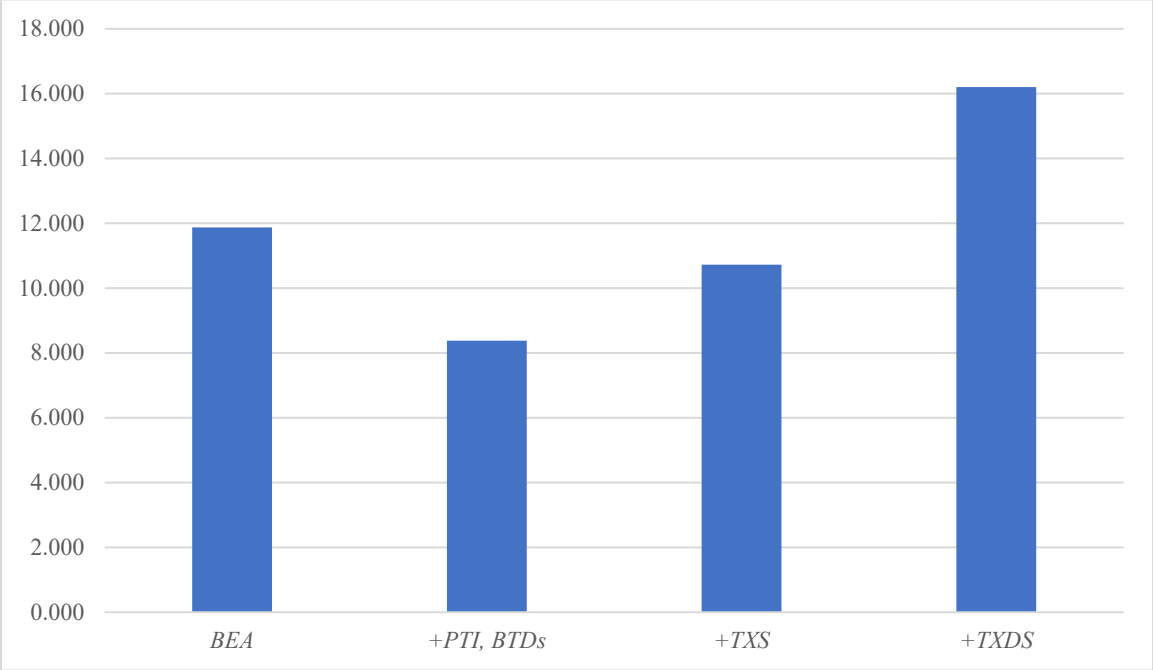

Figure 5 presents in-sample model fit and out-of-sample forecast accuracy for the state and local tax (SALT) adjustment. Panel A reports adjusted R^2 from the in-sample analysis over the 2003–2022 period and is intended to assess model fit. There is no *CBO Base* Model for state and local taxes because CBO relies on BEA's initial SALT estimate. Accordingly, Panel A starts with the following model: $SALTAdjustment_t = \alpha_0 + \beta_1 PTI_t + \beta_2 BTDs_t + \varepsilon_t$. Variables are defined in the Appendix. Panel B plots out-of-sample forecast accuracy, measured using RMSE, based on expanding window forecasts over the 2012–2022 period. Because CBO relies on the BEA's initial estimate of state and local taxes, there is no direct comparison to CBO's published forecasts for this adjustment. Instead, "BEA" in Panel B captures revisions to BEA estimates, defined as the difference between final and initial values. RMSE therefore reflects the ability of each specification to predict these revisions.

FIGURE 6
Pension Adjustment: In-Sample Fit and Out-of-Sample Forecast Accuracy

Panel A: In-Sample Model Fit (Adjusted R^2) for the Sample Period, 1997 – 2022

CBO Base Model	*+PTI, BTDs*	*+PTI, BTDs, Contrib*	*+PTI, BTDs, Contrib, FundedStatus*	*+PTI, BTDs, Contrib, Funded Status, EstPensionBTD*	*+Contrib* only	*+Funded Status* only	*+EstPension BTD* only
0.219	0.188	0.426	0.412	0.382	0.458	0.244	0.334

Panel B: Out-of-Sample Root Mean Squared Error (RMSE)

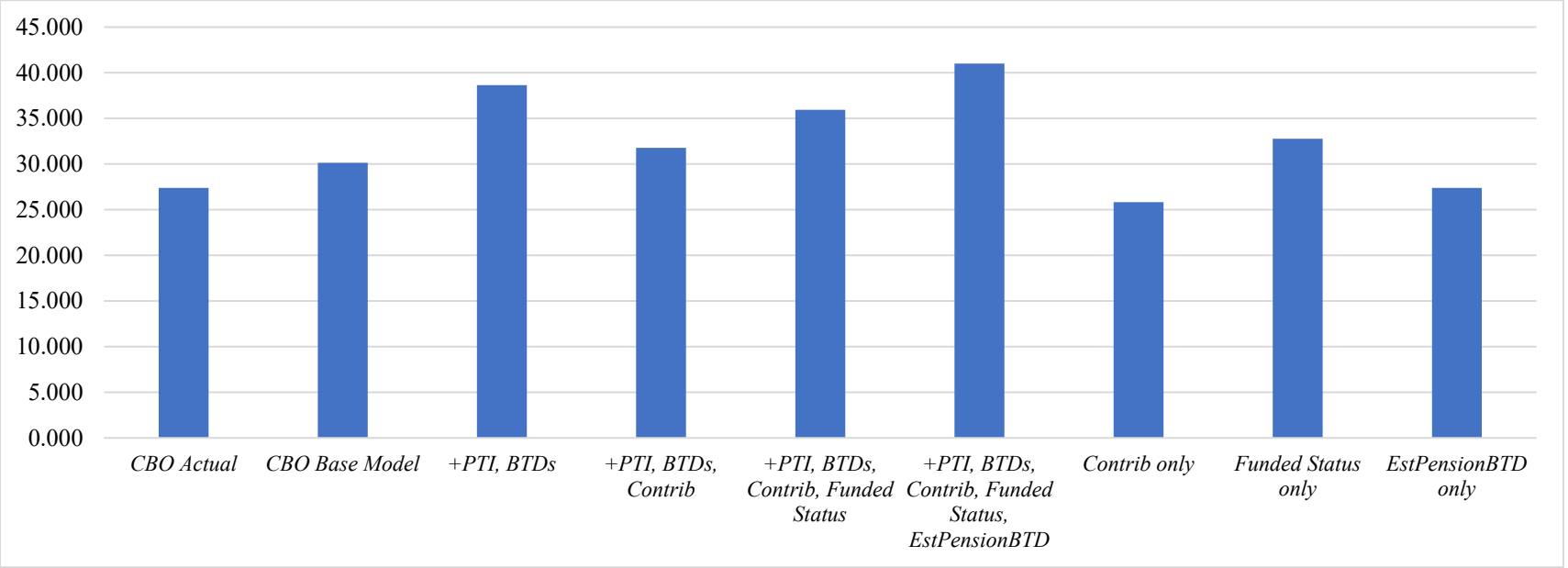

Figure 6 presents out-of-sample forecast accuracy for the pension adjustment. Panel A reports adjusted R^2 from the in-sample analysis over the 1997–2022 period and is intended to assess model fit. Panel A begins with the *CBO Base Model* for pensions: $PensionAdjustment_t = \alpha_0 + \beta_1 PensionAdjustment_{t-1} + \beta_2 10yrAvgPension + \varepsilon_t$. Additional specifications incorporate financial statement variables. Variable definitions are provided in the Appendix. Panel B plots out-of-sample forecast accuracy, measured using RMSE, based on expanding window forecasts over the 2014–2022 period. For each forecast year, the estimation window expands to include all prior available data, and the estimated parameters are used to generate the subsequent year's forecast. "CBO Actual" is the RMSE of CBO's initial baseline forecasts over the same period.

FIGURE 7
Profit and Loss Split: In-Sample Fit and Out-of-Sample Forecast Accuracy

Panel A: In-Sample Model Fit (Adjusted R^2) for the Sample Period, 1986 – 2022

CBO Base Model	*+PTI, BTDs*	*+PTACC, PTCASH, BTDs*
0.924	0.953	0.953

Panel B: Out-of-Sample Root Mean Squared Error (RMSE)

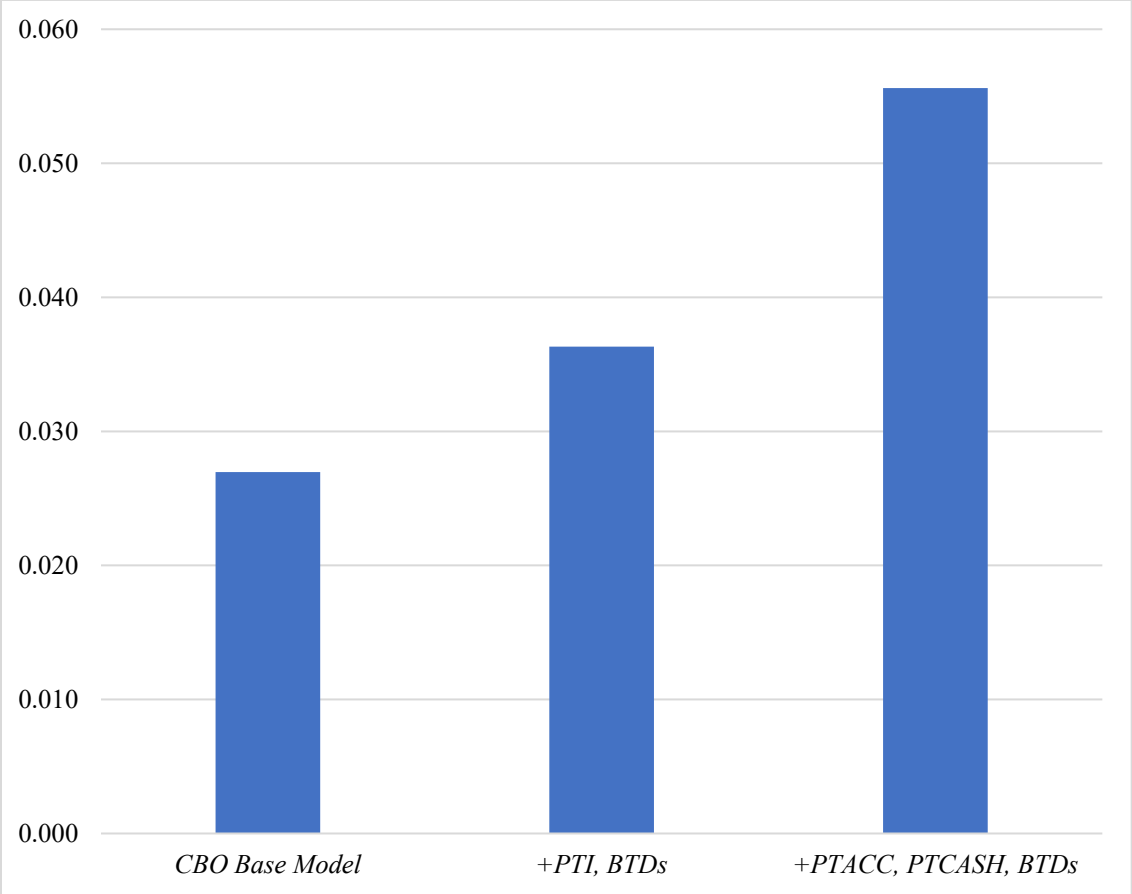

Figure 7 presents in-sample model fit and out-of-sample forecast accuracy for the profit and loss split. Panel A reports adjusted R^2 from the in-sample analysis over the 1986–2022 period and is intended to assess model fit. Panel A begins with the *CBO Base Model* for the profit and loss split: $PosCorpNI_t = \alpha_0 + \beta_1 PosCorpNI_{t-1} + \beta_2 CCorpNI_t + \beta_3 GDP_t + \beta_4\ TaxDepr_t + \beta_5 TCJA + \beta_6 TCJA*CCorpNI_t + \varepsilon_t$. Additional specifications incorporate financial statement variables. Variable definitions are provided in the Appendix. Panel B plots out-of-sample forecast accuracy, measured using RMSE, based on expanding window forecasts over the 2012–2022 period. For each forecast year, the estimation window expands to include all prior available data through year $t-2$, and the estimated parameters are used to generate the subsequent year's forecast using values available at the time of the forecast.

APPENDIX

Variable Definitions

Variable	Definition
All Specifications	
PTI	Annual sum of pretax book income (Compustat PI)
BTDs	Aggregate book-tax differences, computed as the annual sum of pretax book income (Compustat PI) less estimated taxable income from the financial statements (Compustat TXFED + TXFO divided by the statutory rate)
Bad Debt Adjustment	
BadDebtAdjustment	CBO's final adjustment for aggregate bad debt adjustment for year *t*
GDPGap	GDP less CBO's estimate of potential GDP, scaled by GDP
CorpProfits	Corporate profits before tax
EstDA	Estimated doubtful accounts contained in accounts receivable under GAAP rules (Compustat RECD)
TotA/R	Total accounts receivable (Compustat RECT)
NetA/R	Net accounts receivable (Compustat URECT)
ΔA/R	Change in accounts receivable (Compustat RECCH)
Foreign Profits Adjustment	
ForeignProfitsAdj	BEA's final estimate of year *t* foreign profits of U.S. corporations available to CBO at the beginning of year *t*+1 less BEA's initial estimate of year *t* foreign profits.
PIDOM	Annual sum of domestic pre-tax income (Compustat PIDOM)
PIFO	Annual sum of foreign pre-tax income (Compustat PIFO)
PIFO%	Ratio of foreign pre-tax income (Compustat PIFO) to total pre-tax income (Compustat PI)
State and Local Tax Adjustment	
SALTAdjustment	BEA's final estimate of year *t* state and local income taxes available to CBO at the beginning of year *t*+1 less BEA's initial estimate of year *t* state and local income taxes.
TXS	Annual sum of current state and local tax expense (Compustat TXS)
TXDS	Annual sum of deferred state and local tax expense (Compustat TXDS)
Pension Adjustment	
PensionAdjustment	CBO's final adjustment for pension contributions deducted for year *t*
$PensionAdjustment_{t-1}$	Lagged *PensionAdjustment*
10yAvePensionAdj	Rolling ten-year average of *PensionAdjustment*
Contrib	Employer contributions to pension plans (Compustat PBEC)
FundedStatus	Long-term pension assets less all pension liabilities (Compustat PCPPAO)

EstPensionBTD	Estimated pension-related book-tax difference, computed as the pension and retirement expense (Compustat XPR) minus employer pension and retirement contributions (Compustat PBEC and PREC, respectively)
Profit and Loss Split	
PosCorpNI	CBO's final estimate of positive corporate net income for year *t,* scaled by its estimate of potential GDP
$PosCorpNI_{t-1}$	Lagged *PosCorpNI,* scaled by CBO's estimate of potential GDP
CCorpNI	Aggregate C-corp net income subject to tax, based on IRS Statistics of Income (SOI) data through year *t-2* and CBO's internal projections for later years.
GDP	GDP scaled by CBO's estimate of potential GDP
TaxDepr	Aggregate tax depreciation, equal to the sum of historic releases of estimates of consumption of fixed capital (line 28) and the capital consumption adjustment (line 49), from BEA NIPA Table 1.12, scaled by potential GDP, available for year *t* at the time of CBO's baseline estimates in January of year *t*+1
TCJA	Indicator variable equal to one for years after 2017; 0 otherwise.
PTI/EstGDP	*PTI* scaled by CBO's estimate of potential GDP
BTD/EstGDP	*BTD* scaled by CBO's estimate of potential GDP
PTACC	Accrual component of pre-tax income, computed pretax income (Compustat PI) minus operating cash flows (Compustat OANCF), minus cash taxes paid (Compustat TXPD), plus cash flows related to extraordinary items (Compustat XIDOC). *PTACC* is scaled by CBO's estimate of potential GDP.
PTCASH	Cash component of pre-tax income, computed as *PTI* less *PTACC,* scaled by CBO's estimate of potential GDP.

The Appendix defines the variables used in each adjustment model. Variables are grouped by adjustment (bad debt, foreign profits, state and local taxes, pensions, and profit/loss split), with the exception of *PTI* and *BTDs* which are included in all models. Unless otherwise noted, CBO macroeconomic variables are obtained from the *Historical Data and Economic Projections* which are available here: https://www.cbo.gov/data/budget-economic-data#11. Financial statement variables are obtained from Compustat, with corresponding mnemonics reported in parentheses.