

Estimating the Minimum Tax on Book Income Liability using Public Data

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Abstract: We use public data to estimate firm-specific estimates of the minimum tax on book income included in the Inflation Reduction Act. We take into account all major adjustments to financial statement income included in the law, using what we consider the best available public data. Our estimates suggest that approximately 78 firms would have been subject to the tax and the tax would have raised approximately \$31.8 billion had the minimum tax applied to 2021.

Keywords: minimum tax on book income, corporate taxation, tax reform, Inflation Reduction Act

JEL Classification: H25, K34

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We thank Fabio Gaertner and Michelle Hanlon for feedback on our estimation technique. This estimation is based on our understanding of the law, using public data. We appreciate any feedback on aspects of the law and how we attempt to implement the law using public data. All errors are our own. All estimates are subject to change as we have a better understanding of the tax law, get better data, receive feedback, and as we are able to refine our estimation strategies.

Introduction

On August 16, 2022, President Biden signed into the law the so-called Inflation Reduction Act (IRA), a repackaging of some of the components of the Build Back Better Act that had failed legislatively in late 2021. The primary revenue raiser in the IRA was a minimum tax on adjusted book income, a tax intended to collect revenue from corporations who, as a result of tax preferences put in place by Congress, had historically paid a level of tax deemed unacceptable by some. Prior to its final passage when key parts of the bill were not included, the Joint Committee on Taxation (JCT) estimated that approximately 150 firms¹ would be subject to the tax, and it would raise \$222 billion in revenue over 10 years (Joint Committee on Taxation 2022). Following passage of the IRA, the JCT estimated that it would raise \$34 billion in revenue in its first year.²

Taxes on book income, and minimum taxes on a tax base that includes book income, have been previously studied³, and certainly this new iteration of this policy will be examined as to its effects, both intended and unintended.⁴ While such studies are worthwhile, and should inform the usefulness of such a law, in this brief note we do not examine outcomes associated with the tax on book income. Rather, we estimate what firms will be subject to the tax and estimate a potential tax liability for these firms. Using public data, we estimate that, had the law been in existence in 2021, 78 total firms would have been subject to the minimum tax on book income. Total tax liabilities collected from this single year would have been approximately \$31.8 billion.

Methodology

¹ <https://www.finance.senate.gov/imo/media/doc/CAMT%20JCT%20Data.pdf>

² <https://crsreports.congress.gov/product/pdf/R/R47202>

³ Many papers have examined related topics (e.g. Gramlich 1991; Dhaliwal and Wang 1992; Boynton et al. 1992; Manzon 1992; Guenther et al. 1997; Hanlon et al. 2005), for a review of this literature, see Hanlon (2021) and Herzfeld (2020).

⁴ Indeed, these investigations have already started, with Gaertner et al (2022).

The minimum tax on book income compares the company's tax liability without the minimum tax to 15% of the corporation's adjusted financial statement income (AFSI).⁵ If 15% of AFSI is more than the amount of tax without the book minimum tax owed by the corporation, the corporation will be required to include the difference between 15% of its AFSI and the tax previously remitted.⁶ This tax applies only to corporations that have more than \$1 billion in average AFSI (computed without regard to financial statement net operating loss carryovers) over the prior three years ending with the relevant taxable year. To estimate which firms will likely satisfy the book income test and be subject this minimum tax, we obtain financial statement data from Compustat and Calcbench and adjust the data to estimate AFSI. We limit ourselves to publically traded firms, as indicated by their having an end-of-year share price on Compustat (prcc_c).⁷ There are several adjustments to financial statement income to arrive at AFSI. Specifically:

Net income
+Federal Income Taxes
+Foreign Income Taxes
+Financial Statement Depreciation
-Tax Depreciation
-Amortization of Spectrum
+Financial Statement Pension Expense
-Tax Pension Deduction
-Financial Statement NOL
Adjusted Financial Statement Income

⁵ For this analysis we focus only on firms both headquartered and incorporated in the United States (FIC="USA" and LOC="USA" in Compustat). Foreign firms will be subject to this tax, but because Compustat only contains a non-random set of foreign incorporated or headquartered firms, we eliminate these firms. To eliminate noncorporate firms from our Compustat data, we follow the method of Dyreng et al. (2008). This method drops REITs by excluding firms with SIC codes of 6798. It also drops firms with "Trust" as a word in the firm name. It drops partnerships by excluding firms with firm names that end with "LP". It also drops firms with 6-digit CUSIPs ending in Y or Z. We also drop LLPs.

⁶ We require non-missing net income (ni) and non-missing cash taxes paid to federal, state, local, and foreign governments (txpd). Since net income is the primary component of AFSI and federal and foreign taxes are the primary component of our taxes paid measure, we require both so that our estimates are not biased as a result of including firms with income but no corresponding deduction information and vice versa.

⁷ All JCT estimates of revenue and the number of firms will be different than ours for a host of reasons, including that by virtue of having tax return data, their estimates will include private firms who will be subject to the corporate alternative minimum tax based on book income.

To arrive at AFSI from net income, first, we start by taking net income and adding back cash taxes paid to federal, state, local, and foreign governments. To undo the adding back of state and local taxes, which are able to be expensed for AFSI purposes, we then subtract current state and local tax expense, resulting in a number that resembles net income plus federal and foreign taxes paid. We take this indirect approach instead of simply adding federal and foreign income taxes to net income because foreign current tax expense and federal current tax expense are less populated in our dataset than is the measure of cash taxes paid to federal, state, local, and foreign governments.⁸

Next, because tax depreciation is used instead of book depreciation for AFSI purposes, we construct a depreciation adjustment that estimates this difference between book and tax depreciation. Our depreciation adjustment is the change in the deferred tax liability (DTL) associated with property, plant, and equipment (PPE) grossed-up by the relevant statutory tax rate, 21%.⁹ By using the change in this balance sheet number we are able to approximate whether tax depreciation exceeded book depreciation (increase in the DTL for PPE) or not (decrease in DTL) and approximate the dollar value of the difference in depreciation expenses. In the cases where a DTL for PPE is not reported in the financial statements or not XBRL tagged, we estimate the firm's change in DTL for PPE by first obtaining the median change in DTL for PPE scaled by

⁸ While current state tax expense also suffers from the same lack of data availability as do federal current tax expense and foreign current tax expense, we believe that our indirect approach is more valid than the direct approach because having missing federal and foreign tax expense (large magnitudes) introduces more bias than having missing state and local tax expense (which are often smaller magnitudes).

⁹ We assume that all increases in DTL associated with PPE is derived from the U.S., partly because U.S. tax depreciation schedules are particularly favorable compared to many others across the world. This assumption will tend to bias our estimates down, collecting less revenue, and will understate tax liability from companies that are investing in PPE in countries with favorable tax depreciation schedules. It would be possible to adjust this value for the fraction of additional depreciation to take into account the component of this value not attributable to US taxes, but since there are no well-populated estimates of depreciation by country, or even by foreign versus US, we do not make this adjustment. The values we do use are not available in Compustat, but, are required to, if disclosed, have an XBRL tag, and therefore one can obtain them from platforms such as Calcbench (which we use). We use the XBRL tag `DeferredTaxLiabilitiesPropertyPlantAndEquipment`.

capital expenditures for the firms that do report a DTL for PPE.¹⁰ This ratio gives us an idea of how the DTL for PPE would change for a typical firm conditional on a given level of capital expenditures. We then multiply this median ratio to the capital expenditures of firms that do not report a DTL for PPE to get an estimate of what the firm's change in DTL for PPE would be.¹¹ Finally, we gross up this estimated change by the relevant statutory tax rate, 21%, to get our final depreciation adjustment, which represents the estimated difference between tax and book depreciation.¹²

The law then allows for an adjustment for the amortization of spectrum licensing rights. Spectrum license-related assets have an indefinite life under financial accounting rules, and so are not amortized, but for tax purposes are amortized over 15 years. We adjust for this amortization of spectrum licensing rights purchased from the Federal Communications Commission (FCC). Sullivan (2022) estimates that these adjustments are very large, but are concentrated in a very small number of firms. We adjust for the amortization of spectrum by taking from Sullivan (2022) the estimates of spectrum amortization for Verizon, AT&T, T-Mobile, and Dish Network and subtracting those estimates from those firms' net income.¹³

Next, we create an adjustment for pensions. Since, in essence, tax pension expense is used instead of book pension expense for AFSI purposes, we construct a pension adjustment that estimates this difference between book and tax pension expense. To estimate the difference

¹⁰ We do not adjust for asset disposals.

¹¹ This likely overstates the depreciation deduction, since firms that do disclose a DTL associated with PPE likely have larger values than firms do not disclose it, although it is not clear that it would be a larger value as a fraction of CAPX. This would bias our estimates of revenue collected and firms affected down, and would do so particularly for firms with smaller amounts of tax depreciation over book depreciation.

¹² How the depreciation adjustment will be calculated is still an ongoing policy discussion, with a lack of clarity over depreciation-related deductions related to items expensed under the repair regs, and for transition assets.

¹³ This carveout for spectrum is likely mostly captured by the spectrum amortization deductions of these four firms, however, there may be smaller firms that receive amortization deductions for spectrum that we do not account for. Sullivan (2022) notes that FCC auctions since 2008 have yielded proceeds of \$188 billion, \$155 billion of which have been sold to these four carriers.

between book pension expense and tax pension expense, we take a balance sheet approach similar to our approach for our depreciation expense adjustment. We look at the grossed-up change in the Deferred Tax Asset for Tax Deferred Expense for Pension Compensation and Benefits.¹⁴ If this DTA balance increased it implies that book pension expense exceeded tax pension. We gross up the change in this DTA by the relevant statutory tax rate, 21%, and use the grossed-up change as our pension adjustment. In other words, if the DTA balance for pensions increased (decreased), we increase (decrease) our AFSI by the grossed-up change because the book pension treatment likely allowed for a larger (smaller) expense than what was allowed for tax purposes.

Next, we estimate the newly defined financial statement NOL. Previously, financial statement NOLs had not previously existed, as financial accounting does not have a concept of transferring losses to other years. In the book minimum tax rules, financial statement NOLs are able to be carried forward indefinitely and are allowed to offset up to 80% of a firm's AFSI for a given year. Furthermore, the legislation stipulates that this minimum tax on book income will be effective as of fiscal year 2023 and that financial statement NOLs for the book minimum tax can originate no earlier than fiscal year 2020. In our dataset, if a corporation reports a negative AFSI in 2020, this amount of loss is carried forward to 2021. Then in 2021, when calculating AFSI, we offset a corporation's 2021 AFSI by the lower of the financial statement NOL carryover amount or 80% of the 2021 AFSI.¹⁵

¹⁴ The XBRL tag associated with line item, collected using Calcbench, is DeferredTaxAssetsTaxDeferredExpenseCompensationAndBenefitsPensions. Like the XBRL tag for depreciation, this is relatively unpopulated—we assume for the firms for which this value is largest, and will have the largest effect on tax liability, they disclose it. This assumption will overstate the tax liability for firms with an income-increasing pension adjustment but that do not disclose the relevant XBRL tag. Finally, we also assume all of this pension adjustment comes from US-pension payments that would be tax deductible in the US.

¹⁵ When the law goes into effect in 2023, financial statement NOLs will be allowed to be carried forward from 2020—from the past three years. In our analysis, we also start with 2020 financial statement NOLs. If, instead, we allow firms to carry forward financial statement losses from the three prior years, starting in 2018, we get a very similar list of firms.

To be able to estimate the book AMT liability, in addition to needing to estimate a firm's AFSI, we need to estimate how much tax would have been owed without the book minimum tax. As a proxy for federal and foreign taxes without the book minimum tax that would have been paid to the government, we use cash taxes paid to federal, state, local, and foreign jurisdictions less current state and local tax expense for the same data availability reasons described above. Because the corporate AMT liability can be offset with general business credits, we then add to this proxy the general business tax credits claimed by the firm.¹⁶

Having made these adjustments to estimate firms' AFSI and how much taxes the firms paid, we are able to estimate which firms will be affected by this AMT and to what extent.¹⁷ To start the estimation, we apply the book income test. Specifically, we filter out firms that do not have an average 2021 AFSI (calculated without regard to the financial statement NOL carryovers) in excess of \$1 billion over the prior three years ending with the relevant taxable year. To conclude the estimation, we then take our estimated AFSI for 2021 (including the effect of the financial statement NOL carryovers from 2020) and compare 15% of the estimated AFSI to our proxy for taxes paid. Any excess of 15% of AFSI over taxes paid we consider our estimate for the book AMT liability.

We model the tax as if it had existed in 2021—with all other components of the law remaining the same. This carries with it important implications. Every year there will likely be

¹⁶The amount of credits claimed is calculated as the greater of the amount of credits as disclosed in a firm's rate reconciliation using XBRL tag `IncomeTaxReconciliationTaxCredits` or the amount of credits found by multiplying the credit percentage from XBRL tag `EffectiveIncomeTaxRateReconciliationTaxCredits` by a firm's pretax income from Compustat (pi). The XBRL tag figures are obtained using Calcbench. Also, all credits are considered to be lowering a firm's tax liability, in other words, we assume that no matter what sign is reported on credits in the data, the credits are serving to lower the firm's tax liability. This assumes that all credit amounts in the rate reconciliation are for US tax purposes, which will overstate the value of this adjustment for firms that receive state or foreign tax credits (many US states and foreign countries, for example, offer the R&D tax credit, and these are often disclosed jointly with US R&D tax credits). Further, firms are not required to disclose rate reconciliation items if the items are immaterial, and as a result, we will miss these business credits from some firms.

¹⁷ We do not make any adjustments for mark-to-market adjustments or issues related to other equity method investors.

taxpayers who are subject to the book minimum tax one year but who will not be subject to the book minimum tax in other years, and, even taxpayers who would be subject to the tax in 2021, who on a long-term basis would not be subject to the tax at all. For example, some firms may have not paid taxes for some years previous to 2021 because of past NOLs but will start paying in 2022. This is most likely for firms that had large but quickly decreasing NOLs going into 2021, but who used up these NOLs in 2021 or 2022 and would have normal tax rates after 2021.¹⁸

Table 1 displays our estimates of which firms would be subject to the book alternative minimum tax had the book alternative minimum tax been effective in 2021. Table 1 also displays, by firm, our estimates of the amount of tax that would have been required to be remitted as the book alternative minimum tax liability. We estimate that 78 firms would be subject to the tax in 2021 and those firms would remit a total of approximately \$31.8 billion in tax.

¹⁸ For example, Compustat records Paramount Global as having \$2,060 million in tax NOL in 2020, and \$282 million in 2021. If by 2022 and 2023, Paramount Global has used up these NOLs and pays a higher tax rate, Paramount may well not be subject to the tax at all on an ongoing basis, even though had the law existed in 2021, they would have paid in 2021. It is impossible to make this determination both because we are limited to using public data, and, because 2023 tax liabilities will result based on operations that are still in the future. Other possible firms that may well be in this position based on public data and subjective assessments of being able to use up their NOLs in 2022 are Advanced Micro Devices (2020 NOL of \$6,037 million and 2021 NOL of \$2,717 million), Charter Communications (2020 NOL of \$5,523 million and 2021 NOL of \$889 million), and the Carlyle Group (2020 NOL of \$326 million and 2021 NOL of \$25 million). This analysis assumes these NOLs are all from US tax positions and that NOLs reported in the financial statements reflect those on the tax return, which may well not be the case (Heitzman and Lester 2021).

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Table 1 Estimated 2021 Book Corporate Alternative Minimum Tax Liability Using Public Data in Millions of Dollars

Ticker	Company Name	Estimated 2021 Book AMT Liability using Public Data (millions of dollars)	Ticker	Company Name	Estimated 2021 Book AMT Liability using Public Data (millions of dollars)
BRK.B	BERKSHIRE HATHAWAY	\$ 8,331	D	DOMINION ENERGY INC	\$ 158
AMZN	AMAZON.COM INC	\$ 2,772	SBUX	STARBUCKS CORP	\$ 157
F	FORD MOTOR CO	\$ 1,851	CG	CARLYLE GROUP INC	\$ 154
T	AT&T INC	\$ 1,549	COP	CONOCOPHILLIPS	\$ 154
EBAY	EBAY INC	\$ 1,333	PFG	PRINCIPAL FINANCIAL GRP INC	\$ 137
MRNA	MODERNA INC	\$ 1,218	MGM	MGM RESORTS INTERNATIONAL	\$ 131
NVDA	NVIDIA CORP	\$ 982	FOXA	FOX CORP	\$ 130
DUK	DUKE ENERGY CORP	\$ 802	MKL	MARKEL CORP	\$ 127
CHTR	CHARTER COMMUNICATIONS INC	\$ 662	AFG	AMERICAN FINANCIAL GROUP INC	\$ 125
NEE	NEXTERA ENERGY INC	\$ 575	AMAT	APPLIED MATERIALS INC	\$ 124
PARA	PARAMOUNT GLOBAL	\$ 571	EVRG	EVERGY INC	\$ 111
BIO	BIO-RAD LABORATORIES INC	\$ 532	ISRG	INTUITIVE SURGICAL INC	\$ 95
DOW	DOW INC	\$ 500	TFC	TRUIST FINANCIAL CORP	\$ 95
MU	MICRON TECHNOLOGY INC	\$ 484	WBA	WALGREENS BOOTS ALLIANCE INC	\$ 87
FDX	FEDEX CORP	\$ 480	REGN	REGENERON PHARMACEUTICALS	\$ 84
BX	BLACKSTONE INC	\$ 416	OGN	ORGANON & CO	\$ 81
KMI	KINDER MORGAN INC	\$ 410	HUN	HUNTSMAN CORP	\$ 77
USB	US BANCORP	\$ 400	LRCX	LAM RESEARCH CORP	\$ 68
COO	COOPER COS INC (THE)	\$ 384	WM	WASTE MANAGEMENT INC	\$ 59
AMD	ADVANCED MICRO DEVICES	\$ 374	CBRE	CBRE GROUP INC	\$ 57
NRG	NRG ENERGY INC	\$ 340	CTAS	CINTAS CORP	\$ 43
TSLA	TESLA INC	\$ 315	KLAC	KLA CORP	\$ 37
AEP	AMERICAN ELECTRIC POWER CO	\$ 306	CMA	COMERICA INC	\$ 36
CMCSA	COMCAST CORP	\$ 305	EW	EDWARDS LIFESCIENCES CORP	\$ 36
DD	DUPONT DE NEMOURS INC	\$ 280	C	CITIGROUP INC	\$ 35
SO	SOUTHERN CO	\$ 264	MET	METLIFE INC	\$ 33
HUM	HUMANA INC	\$ 241	SWKS	SKYWORKS SOLUTIONS INC	\$ 33
AVGO	BROADCOM INC	\$ 232	PNC	PNC FINANCIAL SVCS GROUP INC	\$ 32
NFLX	NETFLIX INC	\$ 231	RF	REGIONS FINANCIAL CORP	\$ 32
AXP	AMERICAN EXPRESS CO	\$ 228	UPS	UNITED PARCEL SERVICE INC	\$ 23
OKE	ONEOK INC	\$ 227	TXN	TEXAS INSTRUMENTS INC	\$ 23
CINF	CINCINNATI FINANCIAL CORP	\$ 223	A	AGILENT TECHNOLOGIES INC	\$ 22
AGIO	AGIOS PHARMACEUTICALS	\$ 208	HRL	HORMEL FOODS CORP	\$ 16
COIN	COINBASE GLOBAL INC	\$ 195	FTV	FORTIVE CORP	\$ 15
PYPL	PAYPAL HOLDINGS INC	\$ 186	ORI	OLD REPUBLIC INTL CORP	\$ 14
LNC	LINCOLN NATIONAL CORP	\$ 184	IHRT	IHEARTMEDIA INC	\$ 5
APO	APOLLO GLOBAL MGMT INC	\$ 176	FRC	FIRST REPUBLIC BANK	\$ 4
KKR	KKR & CO INC	\$ 174	SLM	SLM CORP	\$ 2
HPE	HEWLETT PACKARD ENTERPRISE	\$ 174	YUM	YUM BRANDS INC	\$ 1
					\$ 31,767