CORPORATE TAX PREFERENCES BEFORE
AND AFTER THE TAX CUTS AND JOBS ACT OF 2017

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We examine the effect of the Tax Cuts and Jobs Act of 2017 (TCJA) on corporate tax preferences and how this effect varies with firm characteristics such as financial performance. We show that the TCJA significantly reduced the extent to which a subsample of profitable firms is tax favored, but it did not change average cash tax differences for the full sample that includes firms with losses. The associations between the tax preferences of profitable firms and their characteristics were generally unaffected by the TCJA. In a sample that includes loss firms, we find that larger firms are less tax favored after the TCJA.

I. INTRODUCTION

The Tax Cuts and Jobs Act of 2017 (TCJA), signed into law in December 2017, represents the most significant change to corporate taxation since the Tax Reform Act of 1986. The TCJA decreased the corporate tax rate from 35 percent to 21 percent and introduced several significant changes to the measurement of taxable income (Schler, 2017). Some provisions, such as full expensing of certain capital investments, were expected to reduce taxable income relative to pretax financial accounting income. Other provisions, such as the immediate domestic taxation of unrepatriated foreign income and limits on the deductibility of interest expense, were expected to increase taxable income relative to pretax financial accounting income.

Since its enactment, the popular press and policy think tanks have debated the effects of the TCJA's provisions on corporate taxes. A recent study by the Institute on Taxation and Economic Policy (ITEP) suggests that the 2018 effective tax rates (ETRs)

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of profitable, Fortune 500 companies are significantly lower than the newly enacted 21 percent statutory tax rate due to the introduction of new corporate tax preferences and loopholes by the TCJA (Gardner, Roque, and Wamhoff, 2019). News articles focused on the TCJA consistently report on the tax status of large, profitable corporations, suggesting that they often pay no federal income taxes.[1] The general opinion seems to be that corporate tax preferences have become more favorable following the TCJA, particularly for profitable corporations. Our study strives to document whether the net effect of the TCJA's changes to the tax rate and to the measurement of taxable income increased or decreased corporate tax preferences, on average. We also examine how the TCJA's effect varies with firm characteristics, including financial performance.

Studies of corporate tax preferences often compare the statutory tax rate to an accounting-based ETR, dividing some measure of financial statement tax expense (current tax expense or total tax expense) by pretax financial accounting income. Accounting studies have noted deficiencies with the use of financial statement tax expense in the numerator of the accounting-based ETR because it includes the effect of accounting accruals, such as the deferred tax valuation allowance, and excludes the effects of some tax preferences (e.g., stock option exercises). Dyreng, Hanlon, and Maydew (2008) suggest using cash taxes paid as reported on financial statements in the numerator of the effective tax rate (Cash ETR) because it excludes the effect of accounting accruals and reflects both temporary and permanent tax deferral strategies.

We also caution that even the Cash ETR can be misleading when examining the association between tax preferences and financial performance. A firm's Cash ETR can vary with financial performance if better performing firms have more (or fewer) favorable tax preferences. Suppose, however, that tax preferences depend on fixed costs that do not vary with income (e.g., depreciation when capital investment policy does not depend on income). In this case, an extra dollar of income is taxed at the statutory rate and will, therefore, shift the ETR toward the statutory rate (Wilkie, 1988). The latter effect results in covariation between firm performance and the Cash ETR that is mechanical in nature.

Henry and Sansing (2018) criticize the use of pretax income in the denominator of Cash ETR because it leads researchers to discard loss firms, resulting in data truncation bias.[2] They propose a measure, defined for both profit and loss firms, that scales cash tax differences (Δ) by the market value of assets (MVA), where cash tax differences

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[1] See, for example, this CBS News article published on April 12, 2019: https://www.cbsnews.com/news/2018-taxes-some-of-americas-biggest-companies-paid-little-to-no-federal-income-tax-last-year/, this article published by *The Hill* on June 6, 2019: https://thehill.com/opinion/finance/447359-fixing-tcja-starts-with-getting-multinationals-to-pay-their-fair-share, and this article published by The Center for Public Integrity on April 11, 2019: https://publicintegrity.org/inequality-poverty-opportunity/taxes/trumps-tax-cuts/you-paid-taxes-these-corporations-didnt/.

[2] Because pretax income can be negative, its use in the denominator of an effective tax rate results in equal values for a firm with a tax refund and positive income and a firm with positive cash taxes paid but negative income.

are defined as the difference between a firm's cash taxes paid (adjusted for the change in tax receivables) and the product of a firm's pretax financial statement income and the statutory rate. Positive (negative) values of cash tax differences reflect unfavorable (favorable) cash book-tax differences, just as a higher (lower) Cash ETR reflects unfavorable (favorable) cash book-tax differences. We measure cash tax differences using Δ/MVA because the denominator is unaffected by a firm's financial performance, enabling us to make reliable inferences about the relation between tax preferences and financial performance. Further, we can analyze the change in cash tax differences after the TCJA for both a profitable subset of firms and the full population of both profit and loss firms. Throughout our analysis, we also compare our results using scaled cash tax differences to results using the Cash ETR to demonstrate how conclusions about the effect of the TCJA differ across the two measures.

We find that our balanced panel of 576 profitable firms was substantially tax favored prior to the TCJA, as over 75 percent of the firms' firm-years exhibited a Cash ETR less than the statutory tax rate and favorable (negative) scaled cash tax differences. The TCJA substantially reduced the extent to which these profitable firms were tax favored. Our balanced panel more than doubles to 1,205 firms when we include firms with losses between 2012 and 2019, underscoring the importance of loss firms in the overall population. In contrast to the profitable subsample, we find that the average firm in the full balanced panel is tax disfavored prior to the TCJA. Scaled cash tax differences in the full sample were virtually unchanged by the TCJA.

We examine how scaled cash tax differences and Cash ETR vary across financial performance quintiles in the pre- and post-TCJA periods. We find that cash tax differences become more favorable as a firm's earnings before interest and taxes (*EBIT*) scaled by the market value of assets increases before and after the TCJA for both the subset of profitable firms and the full sample of firms. However, Cash ETR exhibits a nonmonotone relation with financial performance in the profitable subsample for which it is defined; an increase in scaled *EBIT* shifts the Cash ETR toward the statutory rate. This confirms our concern with the use of Cash ETR to assess the association between firm performance and tax preferences.

We use a multivariate regression to explore the TCJA's effect on the relations between firm characteristics and measures of tax preferences. The firm characteristics we examine include leverage, multinational status, and investment in both tangible and intangible assets. We find that the TCJA had little effect on the association between firm characteristics and either cash tax differences or Cash ETRs of profitable firms. We find that the use of Cash ETR to measure a firm's tax status would lead one to conclude that firms with higher scaled *EBIT* became significantly more tax favored following the TCJA. However, quantile regressions confirm that this average association is driven by the mechanical effect of higher profitability shifting the Cash ETR toward the statutory rate. Using cash tax differences, we find that the association between cash tax preferences and the financial performance of profitable firms is unchanged by the TCJA. Multivariate estimation within the full sample of profit and loss firms shows that scaled *EBIT* and leverage are associated with more favorable cash tax differences and that the TCJA

attenuated this effect. In addition, we find in the full sample that larger firms had less favorable (i.e., more positive) cash tax differences following the TCJA.

Our results contribute to the debate surrounding the TCJA and its effects. Several studies focus on the TCJA's effect on federal corporate revenues and broad aspects of the economy (e.g., Gale et al., 2018; Gravelle and Marples, 2019). There are also studies that examine the effect of individual provisions included in the TCJA on firm decisions, such as the immediate effect of the TCJA's corporate interest deductibility limitation on firms' capital structure decisions (Carrizosa, Gaertner, and Lynch, 2020) and the effect of the TCJA's changes to the deductibility of executive compensation on compensation policies following the TCJA (De Simone, McClure, and Stomberg, 2020; Luna, Schuchard, and Stanley, 2020). These studies find no evidence that the TCJA affects the behavior of profitable firms, consistent with our result that the TCJA did not affect the association between most firm characteristics and tax preferences. Our finding that the TCJA did attenuate some of the relations between tax preferences and certain firm characteristics, such as leverage, in the full sample suggests future studies should broaden their analysis beyond profitable-only firms.

We also contribute to the literature on the measurement of corporate tax avoidance and tax preferences. Henry and Sansing (2018) shows that the exclusion of loss firms when using a Cash ETR to measure tax preferences biases conclusions about the extent of tax avoidance among corporations. We find that the use of pretax income in the denominator of an ETR also leads to incorrect inferences about the association between tax preferences and profitability. We show that a negative association between profitability and Cash ETR does not necessarily mean that firms that are more profitable avoid more tax; rather, this result is mechanical in nature. In the context of the TCJA and firm profitability, we find that one would reach different conclusions about the effect of the TCJA on the cash tax preferences of more profitable firms when using the Cash ETR.

II. BACKGROUND

A. The TCJA

The TCJA drastically altered federal corporate taxation by reducing the top statutory corporate tax rate from 35 percent to 21 percent and eliminating the graduated corporate tax rate schedule. The rate change alone is expected to reduce both average absolute cash tax differences and average Cash ETRs by 40 percent, ceteris paribus. The TCJA also altered the way in which the tax base is computed, with several changes likely increasing the extent to which corporations are tax favored and several changes decreasing the extent to which corporations are tax favored. The TCJA increased the favorable tax treatment of certain qualified investments in depreciable property by allowing full expensing for five years. The TCJA also reduced certain tax deductions. For example, business interest expense, which was generally fully deductible under prior tax law, is now deductible only up to 30 percent of business income (including depreciation).[3]

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[3] Business income excludes depreciation after 2022 and there is an exemption to the business interest limitation for businesses with gross receipts of $25 million or less. Only 49 (772) firm-year observations in our profitable (full) sample of 4,608 (9,776) firm-years have gross receipts of $25 million or less.

Allowable net operating loss (NOL) carryforward deductions were also reduced from 100 percent of taxable income to 80 percent following the TCJA.[4]

The TCJA also altered the taxation of U.S. multinational corporations, moving from a worldwide system of taxation to a territorial system of taxation under which the dividends that a domestic corporation receives from foreign corporations in which it holds ownership of 10 percent or more are exempt from tax. The territorial system is then modified by a series of additional minimum taxes on certain types of foreign income or foreign income that exceeds certain return on assets (ROA) thresholds.[5] The primary changes to corporate taxation are summarized in Table 1. While the rate change will reduce the benefit of cash tax preferences, the effect of the changes to a corporation's tax base on their overall cash tax preferences is ambiguous. It is also not clear, ex ante, whether more profitable corporations would have more favorable tax preferences after the TCJA. The rate change will affect all firms equally, assuming no difference in the behavior of more profitable firms, and the TCJA's most significant changes are not directly related to firm profitability. It is possible, however, that more highly levered firms may have lower tax preferences after the TCJA.

B. Measurement of Tax Preferences

Because researchers cannot observe a corporation's tax returns, they use information provided in publicly filed financial statements to measure corporate tax preferences. Typically, policy makers, public interest groups, and the media use one of several accounting-based ETR measures and compare them to the statutory tax rate to determine whether a corporation or industry is tax favored or tax disfavored. Often, the publications of these groups refer to current tax expense as a summary of the federal income taxes "paid" by corporations.[6] However, "current income tax expense" in a firm's income statement is determined using Generally Accepted Accounting Principles (GAAP). As discussed in Dyreng, Hanlon, and Maydew (2008) and Drake, Hamilton, and Lusch (2020), variation in accounting-based ETRs is often driven by accounting accruals, such as the deferred tax valuation allowance or the unrecognized tax benefit reserve, as opposed to tax preferences. Accounting-based ETRs also exclude some potentially large tax preferences, such as the effect of the exercise of stock options (Hanlon, 2003; Dyreng, Hanlon, and Maydew, 2008).[7]

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[4] NOLs could be carried back for up to two years under prior law but cannot be carried back under the TCJA. The NOL carryforward period was also extended under the TCJA from 20 years to an indefinite period.

[5] These additional taxes are called the minimum tax on global intangible low-taxed income and the base erosion and anti-abuse tax. These provisions are extremely detailed and complex and would require pages of analysis to determine their individual potential effects on firms' tax preferences. As a result, interpreting the effect of the provisions governing the taxation of foreign income included in the TCJA is beyond the scope of this paper.

[6] See, for example, Gardner, Roque, and Wamhoff (2019) published by ITEP and news articles that reference ITEP ETR studies published by the *Washington Post* (https://www.washingtonpost.com/business/2019/12/16/corporations-paid-percent-tax-rate-last-year-steep-drop-under-president-trumps-law/) and NBC News (https://www.nbcnews.com/business/taxes/twice-many-companies-paying-zero-taxes-under-trump-tax-plan-n993046).

[7] The TCJA also limited the deduction related to the exercise of executive stock options to $1 million.

Table 1		
Prior Law versus TCJA Provisions		
	Prior Law	TCJA
Top corporate income tax rate	35%	21%
Corporate alternative minimum tax	Yes	Repealed
New investment purchases	2018: 40% bonus depreciation for qualified property; 2019: 30% bonus depreciation for qualified property; 2020: 20% bonus depreciation for qualified property	100% bonus depreciation for qualified property; phases down from 100% by 20% increments per year starting in 2023
Business interest deduction	Fully deductible (generally)	Disallowed for net interest in excess of 30% of business income (excluding depreciation after 2022)
Taxation of U.S. multinational companies	Worldwide system with deferral and foreign tax credit	Modified territorial system with base erosion provisions; anti-abuse tax on certain payments to foreign corporations; one-time tax on unrepatriated foreign earnings at 8% (15.5% for liquid assets)

Source: Gale et al. (2018).

Dyreng, Hanlon, and Maydew (2008) introduced the Cash ETR, where cash taxes paid as reported on a corporation's Statement of Cash Flows is used as the ETR numerator instead of current income tax expense because it excludes the effect of GAAP accruals. Whereas Dyreng, Hanlon, and Maydew (2008) refine the numerator in the ETR as a measure of firms' tax preferences, Henry and Sansing (2018) focus on the use of pretax income in the denominator of the Cash ETR because it leads researchers to discard loss firms in the study of tax preferences. They show that this practice results in data truncation bias due to the exclusion of nearly half of the population of firms for which financial statement information is available.

We also call attention to the use of pretax income in the denominator of the Cash ETR and suggest it can bias inferences about the association between profitability and tax preferences. Cash ETR will vary with firm profitability if firms with more income

generate larger tax preferences, favorable or unfavorable. Consider the case of a firm with an NOL carryforward. For this firm, an increase in profitability increases the amount of NOL that can be used under current or prior tax law. A more profitable firm may also invest more in physical capital, generating more favorable tax preferences. A more profitable firm is also more likely to experience an increase in stock price and, thus, have more favorable cash tax preferences associated with the exercise of employee stock options. On the other hand, a more profitable firm could hire more workers. To the extent a larger workforce increases the firm's accrued post-retirement healthcare benefits, which are expensed on an accrual basis for financial reporting purposes but on a cash basis for tax purposes, a firm will have unfavorable cash tax preferences that increase with income.

Cash ETR will also vary with income if tax preferences relate to fixed costs (Wilkie, 1988). For example, suppose a firm's tax depreciation exceeds its book depreciation, but an increase in profitability does not change the firm's current investment decisions. In this case, the firm has favorable tax preferences, but an extra dollar of income will increase cash taxes paid at the statutory rate, thereby increasing the Cash ETR. The reverse occurs if the firm has unfavorable cash tax preferences that do not vary with pretax income. Consider a firm that impairs its goodwill following an acquisition in which goodwill was recognized for financial reporting purposes but not for tax purposes. The impairment loss reduces financial statement income but has no effect on cash taxes paid, so the firm is cash tax disfavored with a Cash ETR greater than the statutory rate. An extra dollar of income for this firm that is taxed at the statutory rate will, therefore, decrease the ETR toward the statutory rate even though tax preferences remain unchanged. Each scenario where tax preferences relate to fixed costs yields a relation between Cash ETR and profitability that is mechanical in nature.

The relation between Cash ETR and profitability, therefore, depends jointly on whether a firm's tax preferences vary with income (the former effect we describe) and whether a firm is tax favored or tax disfavored (the latter, mechanical effect we describe). Because we are interested in the association between tax preferences and income, we rely primarily on the Henry and Sansing (2018) measure of cash tax differences that is not mechanically affected by profitability in its denominator. We also compare our conclusions to those that would be generated from the use of the Cash ETR.

III. SAMPLE AND DESCRIPTIVE STATISTICS

We generate a balanced panel of 576 profitable firms present in both a pre-TCJA period spanning 2012–2017 and a post-TCJA period spanning 2018 and 2019.[8] This provides a reasonable period to generate a pre-TCJA baseline and includes the only

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[8] Both 2017 and 2018 represent transition years in which firms could accelerate favorable book-tax differences to exploit the TCJA's tax rate decrease. Our examination of the data suggests that tax preferences in 2017 were similar to those in 2016 and that tax preferences in 2018 were similar to those in 2019. As a result, we include 2017 in the pre-period and 2018 in the post-period. Our inferences are robust to excluding 2017 and 2018 from the analysis.

post-TCJA years for which financial statement tax information is available. A limitation of our study is that changes in 2018 and 2019 could represent transitory changes and could exclude changes that take more time to implement. However, it is important to note that 2018 and 2019 will be the only "clean" post-TCJA years given the impact of COVID-19 and the tax relief provisions included in the Coronavirus Aid, Relief, and Economic Security (CARES) Act passed by Congress and signed into law on March 27, 2020.[9] We examine the sample of Compustat firms with sufficient information to generate scaled cash tax differences (Δ/MVA), a Cash ETR (*Cash ETR*), financial performance measures, and a standard set of firm characteristics used in previous studies.

Cash ETR is equal to cash taxes paid divided by pretax income and is reset to zero if it is negative and one if it exceeds 100 percent, to remain consistent with previous studies.[10] Δ/MVA is equal to the difference between cash taxes paid, adjusted for the change in tax receivables, and the product of a firm's pretax income and the statutory tax rate, which is then scaled by MVA.[11] We measure firm financial performance as *EBIT* in the numerator divided by MVA.[12] Our sample, outlined in Table 2, is composed of a balanced panel of 9,776 firm-years (1,222 firms) of both profit and loss observations and 4,608 firm-years (576 firms) in which every firm-year has positive pretax book income. We use the profitable subsample to document the effect of the TCJA on the tax preferences of profitable firms and to evaluate our expectations with respect to the empirical properties of *Cash ETR* versus Δ/MVA. We use the full sample to estimate the TCJA's effect on the tax preferences of the full population of public corporations.

We present in Table 3 descriptive statistics for both the full sample and the profitable subsample. On average, profitable firms were substantially tax favored prior to the TCJA, with a negative average Δ/MVA (–0.54 percent) and average *Cash ETR* well below the 35 percent statutory rate (25.13 percent). Further, over 75 percent of profitable firms have Δ/MVA less than zero and *Cash ETR* below the statutory rate prior to the TCJA. The TCJA substantially reduced the extent to which firms are tax favored, with average *Cash ETR* of 21.48 percent, roughly equal to the post-TCJA statutory tax rate. A mean Δ/MVA very close to zero (–0.05 percent) also suggests that, on average, firms have negligible cash tax differences following the TCJA. The TCJA's statutory tax rate change, assuming no other changes, would yield a 40 percent decrease in *Cash ETR* and move cash tax differences 40 percent closer to zero (i.e., favorable cash tax differences ($\Delta \leq 0$) would increase and unfavorable cash tax differences ($\Delta > 0$) would decrease).

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[9] The CARES Act allows carrybacks of certain NOLs, suspended the 80 percent NOL deduction, increased the business interest limitation to 50 percent for years beginning in 2019 and 2020, and accelerated the refundability of AMT credits relative to the TCJA.

[10] Our results do not change if we adopt the approach of winsorizing *Cash ETR*.

[11] *MVA* is equal to a firm's market value of equity plus book value of debt.

[12] Prior studies generally measure financial performance as a firm's pretax income divided by assets. We use *EBIT*, as opposed to pretax income, because the use of pretax income includes the effects of both operating profitability and leverage. The use of *EBIT* allows us to separate these two effects on cash tax differences and *Cash ETR* in our analyses. In additional analyses, we use pretax income scaled by *MVA* to ensure our conclusions related to firm performance cannot be attributed to the exclusion of interest expense.

Table 2

Sample Selection

Sample Period	2012–2019
Domestic corporation firm-years	39,362
Less:	
Missing pretax income	(12,409)
Missing cash taxes paid	(4,079)
Missing control variables	(4,804)
Missing data in any year of the sample period	(8,294)
Balanced panel of profit and loss firm-years	9,776
Less:	
Firm-years for firms experiencing a loss in any year	(5,168)
Balanced panel of profitable-only firm-years	4,608

Notes: This table presents the sample selection process. The sample period begins in 2012 and ends in 2019. Sample selection begins with the population of domestic corporate entities where the Compustat variable STKO is not equal to one (subsidiary of a publicly traded company), STKO is not equal to two (subsidiary of a nonpublicly traded company), and STKO is equal to zero (publicly traded company) and share price is nonmissing as our reading of firms' 10-Ks indicates that, although a firm is currently a publicly traded firm, the firm-years included in our study represent subsidiary years. After dropping subsidiary observations, we drop observations with missing pretax income and cash taxes paid and observations with missing information necessary to compute *Δ/MVA, Cash ETR*, and firm characteristics used in multivariate analysis. We restrict the sample to a balanced panel of firms with information available for each year of the sample period. From the full sample of profit and loss firm-years, we generate a profitable subsample with pretax income greater than zero in each of the sample years.

The change in Δ/MVA from –0.54 percent to –0.05 percent and the change in *Cash ETR* from 10 percentage points below the statutory tax rate to slightly above the statutory tax rate both indicate that the TCJA's changes to the tax base also resulted in a reduction in the tax preferences of profitable firms. Conclusions about the TCJA's effects from Table 3 change dramatically when looking at distributions for the full sample of firms in Panel B. We find that the average firm in the full balanced panel is tax disfavored prior to the TCJA. Scaled cash tax differences were virtually unchanged by the TCJA, equal to an average Δ/MVA of about 0.05 before and after the TCJA.

We provide an overview of the relation between measures of tax preferences and firm profitability in Table 4, which reports mean Δ/MVA and *Cash ETR* by quintiles of *EBIT* divided by the market value of assets.[13] Table 4 indicates a clear and consistent negative

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[13] Our conclusions in Table 4 remain when using pretax *ROA* instead of *EBIT* as a measure of financial performance.

Table 3

Descriptive Statistics

A Comparison of the Pre-TCJA Period (2012–2017) to the Post-TCJA Period (2018–2019)

	Pre-TCJA ($n = 3,456$)					Post-TCJA ($n = 1,152$)					Pre vs. Post
	Mean	Std	P25	P50	P75	Mean	Std	P25	P50	P75	
Panel A. Profitable subsample											
ΔMVA	−0.0054	0.0101	−0.0097	−0.0047	−0.0008	−0.0005	0.0082	−0.0034	−0.0006	0.0018	0.0049***
Cash ETR	0.2513	0.1732	0.1363	0.2498	0.3341	0.2148	0.1781	0.1222	0.1951	0.2539	−0.0366****
PTI	0.0541	0.0296	0.0352	0.0506	0.0677	0.0460	0.0232	0.0295	0.0442	0.0592	−0.0080***
EBIT	0.0621	0.027	0.0467	0.0594	0.0743	0.0545	0.0226	0.0387	0.0526	0.0668	−0.0076***
SIZE	7.8706	1.8973	6.6675	7.8378	9.1397	8.2045	1.8514	7.0905	8.1562	9.4393	0.3338***
LEV	0.1524	0.1510	0.0379	0.1210	0.2239	0.1749	0.1597	0.0521	0.1423	0.2564	0.0225***
INTAN	0.1446	0.1603	0.0197	0.0946	0.2141	0.1555	0.1708	0.0242	0.1074	0.2359	0.0108*
ADV	0.0051	0.0141	0.0000	0.0000	0.0035	0.0045	0.0121	0.0000	0.0000	0.0034	−0.0006
CAPEX	0.0283	0.0355	0.0074	0.0163	0.0367	0.0266	0.0338	0.0066	0.0147	0.0332	−0.0017
FOR	0.5978	0.4904	0.0000	1.0000	1.0000	0.6172	0.4863	0.0000	1.0000	1.0000	0.0194
NOL	0.5738	0.4946	0.0000	1.0000	1.0000	0.6007	0.4900	0.0000	1.0000	1.0000	0.0269
PPE	0.3135	0.3209	0.0739	0.1929	0.4548	0.3147	0.3212	0.0712	0.1861	0.4738	0.0013
SGA	0.0949	0.1139	0.0193	0.0673	0.1268	0.0846	0.1075	0.0177	0.0592	0.1092	−0.0104***
R&D	0.0077	0.0160	0.0000	0.0000	0.0091	0.0066	0.0131	0.0000	0.0000	0.0080	−0.0010**

Table 3 (continued) Descriptive Statistics

A Comparison of the Pre-TCJA Period (2012–2017) to the Post-TCJA Period (2018–2019)

	Pre-TCJA (n = 7,332)					Post-TCJA (n = 2,444)					Pre vs. Post
	Mean	Std	P25	P50	P75	Mean	Std	P25	P50	P75	
Panel B: Full sample of profit and loss observations											
Δ/MVA	0.0049	0.0340	−0.0084	−0.0023	0.0065	0.0050	0.0213	−0.0032	0.0004	0.0066	0.0001
PTI	0.0144	0.1035	0.0025	0.0359	0.0590	0.0058	0.1041	−0.0022	0.0299	0.0516	−0.0086***
EBIT	0.0314	0.0834	0.0191	0.0493	0.0680	0.0251	0.0835	0.0180	0.0431	0.0619	−0.0063***
SIZE	7.0429	2.3815	5.7151	7.2107	8.6165	7.2780	2.4111	5.9761	7.4812	8.8504	0.2351***
LEV	0.1638	0.1751	0.0175	0.1208	0.2431	0.1974	0.1908	0.0448	0.1511	0.2893	0.0336***
INTAN	0.1397	0.1716	0.0100	0.0784	0.2083	0.1487	0.1768	0.0115	0.0914	0.2281	0.0091**
ADV	0.0058	0.0169	0.0000	0.0000	0.0028	0.0054	0.0154	0.0000	0.0000	0.0026	−0.0004
CAPEX	0.0332	0.0463	0.0073	0.0171	0.0402	0.0313	0.0431	0.0064	0.0160	0.0384	−0.0018*
FOR	0.5600	0.4964	0.0000	1.0000	1.0000	0.5761	0.4943	0.0000	1.0000	1.0000	0.0161
NOL	0.6784	0.4671	0.0000	1.0000	1.0000	0.7115	0.4531	0.0000	1.0000	1.0000	0.0331***
PPE	0.3888	0.4257	0.0819	0.2277	0.5830	0.4260	0.4951	0.0843	0.2226	0.6234	0.0372***
SGA	0.1282	0.1579	0.0263	0.0809	0.1724	0.1224	0.1504	0.0263	0.0757	0.1610	−0.0058
R&D	0.0154	0.0355	0.0000	0.0000	0.0142	0.0145	0.0348	0.0000	0.0000	0.0127	−0.0010

Notes: This table presents descriptive statistics for the profitable subsample in Panel A and the full sample in Panel B. The "Pre vs. Post" column presents t-tests of differences in means across each sample period. ***, **, and * indicate statistical differences at the 1, 5, and 10 percent levels, respectively, using a two-tailed test. Δ/MVA represents scaled cash tax differences. Δ is equal to the difference between cash taxes paid (TXPD) less the change in tax receivables (TXR) and the product of pretax financial accounting income (PI) and the statutory tax rate (35 percent in the pre-TCJA period and 21 percent in the post-TCJA period). MVA represents a firm's market value of assets and is equal to a firm's book value of assets (AT) plus the difference between market value of equity (PRCC_F × CSHO) and book value of equity (SEQ). Cash ETR is equal to cash taxes paid (TXPD) divided by pretax income (PI). PTI represents pretax ROA and is equal to pretax income divided by MVA. EBIT equals EBIT scaled by MVA. SIZE is equal to the natural log of average total assets (AT). LEV is equal to the average long-term debt (DLTT). INTAN is equal to intangible assets (INTAN). ADV is equal to advertising expense (XAD). ADV is set equal to zero if missing. CAPEX is equal to capital expenditures (CAPX). FOR is an indicator variable equal to one if the firm reports a nonmissing, nonzero amount of pretax foreign income (PIFO). NOL is an indicator variable set equal to one if a firm reports a nonmissing, nonzero amount of NOL carryforward (TLCF). PPE is equal to gross property plant and equipment (PPEGT). SGA is equal to selling, general, and administrative expense (XSGA). R&D is equal to research and development expense (XRD). All continuous firm characteristics are scaled by MVA. Compustat data items are in parentheses. All continuous variables except Cash ETR, which is reset to fall between zero and one, are winsorized at 1 and 99 percent.

Table 4

Average Cash Tax Difference Measures by Profitability Quintile
Average Δ/*MVA* and *Cash ETR* across Scaled *EBIT* Quintiles for the Pre-TCJA Period (2012–2017) and the Post-TCJA Period (2018–2019)

	EBIT Q1	*EBIT* Q2	*EBIT* Q3	*EBIT* Q4	*EBIT* Q5	Q5 vs. Q1
Panel A: Profitable subsample						
Pre-TCJA						
Δ/*MVA*	−0.0037	−0.0055	−0.0048	−0.0054	−0.0074	−0.0037***
Tax favored	−0.0058	−0.0080	−0.0071	−0.0078	−0.0119	−0.0061***
Tax disfavored	0.0045	0.0059	0.0045	0.0044	0.0067	0.0022
Cash ETR	23.42%	21.76%	26.83%	26.77%	27.26%	3.83%***
Tax favored	15.31%	15.72%	21.35%	22.43%	22.04%	6.73%***
Tax disfavored	55.40%	47.87%	48.09%	43.88%	42.67%	−12.74%***
Post-TCJA						
Δ/*MVA*	0.0004	−0.0006	−0.0004	−0.0001	−0.0015	−0.0019*
Tax favored	−0.0034	−0.0032	−0.0035	−0.0042	−0.0065	−0.0031***
Tax disfavored	0.0054	0.0034	0.0033	0.0040	0.0063	0.0009
Cash ETR	24.39%	19.85%	21.41%	21.89%	19.99%	−4.40%**
Tax favored	9.44%	11.39%	13.61%	14.85%	12.89%	3.45%***
Tax disfavored	43.89%	32.42%	31.00%	29.40%	31.72%	−12.17%***
Panel B: Full sample of profit and loss observations						
Pre-TCJA						
Δ/*MVA*	0.0381	0.0007	−0.0034	−0.0047	−0.0076	−0.0457***
Tax favored	−0.0071	−0.0081	−0.0080	−0.0089	−0.0150	−0.0079***
Tax disfavored	0.0738	0.0224	0.0126	0.0104	0.0095	−0.0642***
Post-TCJA						
Δ/*MVA*	0.0245	0.0019	0.0001	0.0002	−0.0027	−0.0273***
Tax favored	−0.0051	−0.0040	−0.0044	−0.0053	−0.0101	−0.0050***
Tax disfavored	0.0412	0.0102	0.0067	0.0052	0.0073	−0.0339***

Notes: This table presents average cash tax difference measures by quintile of a firm's earnings, before interest and taxes, scaled by market value of assets (*EBIT/MVA*) by year. Panel A presents means for the profitable subsample and Panel B presents means for the full sample of firms. We separately report average cash tax differences and *Cash ETR* for tax favored (Δ ≤ 0) and tax disfavored (Δ > 0) firm-years. ***, **, and * indicate statistical differences at the 1, 5, and 10 percent levels, respectively, using a two-tailed *t*-test. See Table 2 for detailed variable definitions.

association between *EBIT* and *Δ/MVA* for both the profitable and full sample of firms, suggesting that more profitable firms have more favorable cash tax preferences. There is little relation between *EBIT* and *Cash ETR*, on average. However, splitting the sample on whether the firm is tax favored (Δ ≤ 0) or tax disfavored (Δ > 0) reveals that *Cash ETR* is always moving toward the statutory rate as *EBIT* increases. These patterns are consistent with the mechanical relation between Cash ETR and financial performance previously described. They also highlight the unreliability of *Cash ETR* to measure tax preferences when one is interested in the relation between tax preferences and financial performance, even in samples composed of only profitable firms.

IV. TCJA AND FIRM CHARACTERISTICS

Because controlling for profitability and other firm characteristics is important when examining the effects of tax policy changes on tax preferences (Shevlin and Porter, 1992; Gupta and Newberry, 1997), we employ a multivariate framework that incorporates them. We regress *Cash ETR* and *Δ/MVA* on firm characteristics, a post-TCJA indicator variable, and the interaction of the post-TCJA indicator with each firm characteristic in the profitable subsample to understand how the mechanical properties of *Cash ETR* we describe affect inferences about the TCJA's effect. We also separately regress *Δ/MVA* on firm characteristics and their interaction with a post-TCJA indicator variable to understand the TCJA's effect on the full population of public corporations. Our model is as follows:

$$
\begin{aligned}
(1) \quad Tax\ Preferences_{i,t} ={}& a_i + \beta_1 EBIT_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 INTAN_{i,t} \\
& + \beta_5 ADV_{i,t} + \beta_6 CAPEX_{i,t} + \beta_7 FOR_{i,t} + \beta_8 NOL_{i,t} + \beta_9 PPE_{i,t} + \beta_{10} SGA_{i,t} \\
& + \beta_{11} R\&D_{i,t} + \beta_{12} PostTCJA_{i,t} + \beta_{13} EBIT \times PostTCJA_{i,t} + \beta_{14} SIZE \times PostTCJA_{i,t} \\
& + \beta_{15} LEV \times PostTCJA_{i,t} + \beta_{16} INTAN \times PostTCJA_{i,t} + \beta_{17} ADV \times PostTCJA_{i,t} \\
& + \beta_{18} CAPEX \times PostTCJA_{i,t} + \beta_{19} FOR \times PostTCJA_{i,t} + \beta_{20} NOL \times PostTCJA_{i,t} \\
& + \beta_{21} PPE \times PostTCJA_{i,t} + \beta_{22} SGA \times PostTCJA_{i,t} + \beta_{23} R\&D \times PostTCJA_{i,t} \\
& + \delta_k + \varepsilon_{i,t}.
\end{aligned}
$$

We include a set of firm characteristics common to the prior tax avoidance literature (e.g., Dyreng, Hanlon, and Maydew, 2008) that includes firm size (*SIZE*); leverage (*LEV*); intangible assets (*INTAN*); advertising expense (*ADV*); capital expenditures (*CAPEX*); the existence of foreign operations (*FOR*); the existence of a NOL carryforward (*NOL*); property, plant, and equipment (*PPE*); selling, general, and administrative expense (*SGA*); and research and development expense (*R&D*). We scale all continuous firm characteristics by *MVA* and include industry fixed effects (δ_k). Detailed variable definitions are included in Table 2. The result of estimating Equation (1) for the two measures of cash tax preferences across the profitable and full sample are presented in Table 5. Panel A presents estimated coefficients for the fully interacted model, and

Table 5

Multivariate Analysis of TCJA and Firm Characteristics
Regressions of Δ/MVA and *Cash ETR* on Firm Characteristics,
an Indicator for the Post-TCJA Period, and the Interaction
of the Post-TCJA Indicator with Firm Characteristics

	Profitable Subsample		Full Sample
Dependent Variable	Δ/MVA	*Cash ETR*	Δ/MVA
Panel A. Fully interacted regression of cash tax differences on firm characteristics and a TCJA indicator			
EBIT	**–0.0931**	–0.2333	**–0.3016**
	(–6.13)	(–1.29)	**(–27.72)**
SIZE	**–0.0005**	**–0.0096**	**–0.0010**
	(–3.21)	**(–3.51)**	**(–2.70)**
LEV	–0.0030	–0.0551	**0.0117**
	(–0.99)	(–1.19)	**(3.91)**
INTAN	0.0037	**0.1003**	**0.0150**
	(1.61)	**(3.02)**	**(5.39)**
ADV	–0.0314	–0.1448	–0.0153
	(–1.24)	(–0.47)	(–0.45)
CAPEX	**–0.0354**	**–0.6688**	**–0.0313**
	(–2.84)	**(–4.39)**	**(–3.21)**
FOR	**0.0019**	**0.0359**	**0.0025**
	(2.80)	**(3.06)**	**(2.77)**
NOL	**–0.0014**	**–0.0236**	**–0.0034**
	(–2.65)	**(–2.74)**	**(–4.54)**
PPE	**0.0026**	**0.0482**	**0.0041**
	(1.75)	**(2.05)**	**(2.52)**
SGA	**0.0124**	**0.1735**	**0.0195**
	(2.35)	**(3.32)**	**(3.60)**
R&D	**–0.0518**	**–0.8133**	0.0004
	(–2.58)	**(–2.71)**	(0.02)
PostTCJA	0.0000	0.0099	**–0.0132**
	(0.00)	(0.17)	**(–2.43)**
EBIT × PostTCJA	0.0165	**–1.3941**	**0.0968**
	(0.60)	**(–3.73)**	**(8.02)**
SIZE × PostTCJA	0.0001	–0.0042	**0.0011**
	(0.85)	(–0.95)	**(2.62)**
LEV × PostTCJA	0.0031	0.1135	**–0.0051**
	(1.12)	(1.59)	**(–1.81)**
INTAN × PostTCJA	0.0000	0.0668	–0.0047
	(0.01)	(1.26)	(–1.28)
ADV × PostTCJA	0.1617	0.0063	0.0034
	(1.16)	(0.01)	(0.09)

Table 5 (continued) Multivariate Analysis of TCJA and Firm Characteristics Regressions of Δ/MVA and *Cash ETR* on Firm Characteristics, an Indicator for the Post-TCJA Period, and the Interaction of the Post-TCJA Indicator with Firm Characteristics

	Profitable Subsample		Full Sample
Dependent Variable	Δ/MVA	Cash ETR	Δ/MVA
Panel A. Fully interacted regression of cash tax differences on firm characteristics and a TCJA indicator			
CAPEX × PostTCJA	0.0077	–0.2400	**0.0362**
	(0.53)	(–1.06)	**(1.94)**
FOR × PostTCJA	0.0006	0.0052	–0.0002
	(0.71)	(0.31)	(–0.23)
NOL × PostTCJA	0.0008	0.0089	0.0010
	(1.33)	(0.68)	(1.23)
PPE × PostTCJA	–0.0024	0.0171	**–0.0027**
	(–1.31)	(0.44)	**(–1.94)**
SGA × PostTCJA	–0.0031	0.1086	–0.0047
	(–0.49)	(1.47)	(–0.99)
R&D × PostTCJA	0.0415	**2.0770**	–0.0132
	(1.35)	**(2.70)**	(–0.45)
N	4,608	4,608	9,776
Adj. R^2	16.80%	18.95%	59.25%
Ind. fixed effects	Yes	Yes	Yes
Panel B. Post-TCJA Associations			
EBIT	–0.0766***	–1.6274***	–0.2047***
SIZE	–0.0003***	–0.0137***	0.0002
LEV	0.0001	0.0584	0.0066**
INTAN	0.0037*	0.1671***	0.0103***
ADV	0.1302	–0.1385	–0.0120
CAPEX	–0.0277***	–0.9088***	0.0049
FOR	0.0025***	0.0410***	0.0023***
NOL	–0.0005	–0.0147	–0.0024***
PPE	0.0002	0.0653*	0.0014
SGA	0.0093**	0.2821***	0.0148***
R&D	–0.0104	1.2637*	–0.0128

Notes: Panel A presents coefficient estimates from OLS regressions of Δ/MVA and *Cash ETR* on firm characteristics, an indicator variable for the post-TCJA period (*PostTCJA,* equal to one for 2018 and 2019), and the interactions between firm characteristics and the *PostTCJA* indicator. Coefficient estimates and *t*-statistics in bold represent those that are statistically different from zero with a two-tailed *p*-value of 0.10 or less. Panel B presents the post-TCJA association between firm characteristics and cash tax preferences. Standard errors are clustered by firm. The estimates presented in Panel B equal the sum of the estimated coefficient on a firm characteristic in Panel A and the estimated coefficient on the interaction between *PostTCJA* and the firm characteristic. ***, **, and * indicate statistical difference of the sum from zero at the 1, 5, and 10 percent levels, respectively, using a Wald's *F*-test. Detailed variable definitions are contained in Table 2.

Panel B presents tests of the statistical significance of the association between firm characteristics and cash tax preferences after the TCJA (i.e., the sum of the estimated coefficient for a firm characteristic and the estimated coefficient on the interaction between the firm characteristic and *PostTCJA*). Standard errors are clustered by firm.

Focusing first on Δ/*MVA*, we find negative and statistically significant coefficients on *EBIT* prior to the adoption of the TCJA for both the profitable subsample (–0.0931) and the full sample (–0.3016). These results indicate that, pre-TCJA, cash tax differences became more favorable as firm performance improved. *Ex ante*, we expect the TCJA's statutory rate decrease to attenuate the association between Δ/*MVA* and *EBIT* because the reduction in the statutory tax rate from 35 percent to 21 percent reduces the numerator of scaled cash tax differences by 40 percent. However, we are agnostic with respect to the effect of tax base changes on *EBIT* × *PostTCJA*. We find that the coefficients on *EBIT* × *PostTCJA* were positive but insignificant (0.0165) for the profitable subsample and positive and significant for the full sample (0.0968). The coefficients on *EBIT* remained negative and significant following the adoption of the TCJA for both the profitable subsample (–0.0766) and the full sample (–0.2047). We, therefore, find that the TCJA did not affect the association between cash tax differences and firm performance for the profitable subsample of firms, but attenuated it in the full sample.

We find negative and statistically significant coefficients on *SIZE* before adoption of the TCJA for both the profitable subsample (–0.0005) and the full sample (–0.0010), indicating that larger firms generate more favorable cash tax differences. The coefficient on *SIZE* remained negative and significant after the adoption of the TCJA (–0.0003) for the profitable subsample, but became positive and insignificant for the full sample (0.0002). Further, the TCJA had no effect on the association between cash tax differences and *SIZE* for the profitable firms, but larger firms in the full sample are associated with less favorable (i.e., more positive) cash tax differences following the TCJA (positive and significant coefficient on *SIZE* × *PostTCJA* in the full sample). Average cash tax differences not explained by firm characteristics, captured by *PostTCJA*, became more favorable (–0.0132) for the full sample, but not for the profitable subsample (0.0000), and the interactions between other control variables and *PostTCJA* were generally insignificant, suggesting the TCJA had little effect on the association between firm characteristics and cash tax differences.

We compare the results using Δ/*MVA* to those using *Cash ETR* to measure tax preferences. We only analyze *Cash ETR* for the profitable subsample because the ETR is not interpretable for loss-year observations. We first find that the associations between firm characteristics and *Cash ETR* and the interactions between *PostTCJA* and firm characteristics are generally consistent with those using Δ/*MVA*. However, inferences about the association between tax preferences and profitability, and the TCJA's effect on this association, differ across the two measures. As previously discussed, we expect the associations between both *Cash ETR* and Δ/*MVA* and firm performance to reflect covariation between firm performance and tax preferences, but the association between *Cash ETR* will also reflect the mechanical effect of tax preferences that relate to fixed costs and do not vary with firm performance. The statistically insignificant coefficient (–0.2333) on *EBIT* when we use *Cash ETR* as our tax preference measure, therefore,

likely reflects the mechanical, nonmonotone relation between *Cash ETR* and firm performance documented in Table 4.

To further test our expectation that the association between *Cash ETR* and firm performance is nonmonotone, we estimate quantile regressions of Δ/*MVA* and *Cash ETR* on firm characteristics in Table 6. Because they are the primary firm characteristics associated with a TCJA effect in either the full or profitable sample, we report only the results on *EBIT*, *SIZE*, and leverage (*LEV*). We find positive and significant coefficients on the lowest three quantiles of *Cash ETR* and for which the *Cash ETR* is less than the statutory rate (0.6429, 0.6277, and 0.3496, respectively). We find a negative and significant coefficient on the highest quantile (–0.3887) of *Cash ETR*, for which the majority of *Cash ETR* realizations exceed the statutory rate. This confirms our concerns about the use of *Cash ETR* to draw inferences about the association between tax preferences and profitability in a multivariate framework.

We also find that leverage induces a similar mechanical effect on *Cash ETR*, with statistically significant negative coefficients (–0.1930, –0.1615, and –0.0950) in the three quantiles for which the *Cash ETR* is less than the statutory tax rate. Thus, our empirical results suggest that an extra dollar of leverage produces an interest deduction at the statutory rate, generally shifting *Cash ETR* away from the statutory tax rate. Expressing *Cash ETR* in terms of Δ helps to explain this result. Let y be unscaled *EBIT*, x be interest expense, and t be the statutory tax rate. Then

$$(2) \quad Cash\,ETR = \frac{t(y-x)+\Delta}{y-x}.$$

Differentiation shows that the effect of y and x on *Cash ETR* depends on the sign of Δ (e.g., decreasing in y and increasing in x if Δ > 0 and vice versa if Δ < 0). The fact that the coefficients on *LEV* when explaining Δ/*MVA* for the profitable subsample have inconsistent signs and lack statistical significance suggests there is no reliable relation between leverage and cash tax differences, consistent with the idea that the negative relation between *LEV* and *Cash ETR* is a mechanical one.

Throughout our analysis, we measure firm financial performance as *EBIT* divided by *MVA*. Although prior studies typically use pretax income *PTI* divided by assets, or pretax ROA, to measure financial performance, we prefer *EBIT* to pretax book income (*PTI*) in the numerator of our financial performance measure. ROA is an incongruent measure of financial performance because leverage reduces the numerator via interest expense but has no effect on the denominator. Because the prior literature has used scaled *PTI* instead of scaled *EBIT* as a financial performance control variable, we perform the same multivariate analysis as in Table 6, but use scaled *PTI* instead of scaled *EBIT* to show that our use of scaled *EBIT* does not explain our main results.

We report our results in Table 7. The signs and statistical significance of the coefficients on scaled *PTI* are similar to the results in Table 6 for scaled *EBIT*. However, the coefficients on *LEV* for Δ/*MVA* in the full sample change from being negative and significant in Table 6 to positive and significant in Table 7. This occurs because *PTI* using pretax income is the difference between *EBIT* and interest expense. This distorts the coefficient on *LEV* because *LEV* and interest expense are highly correlated.

Table 6

TCJA, Cash Tax Differences, and Firm Characteristics across the Distribution of Cash Tax Differences Quantile Regressions of Δ/MVA and *Cash ETR* on Firm Characteristics, an Indicator for the Post-TCJA Period, and the Interaction of the Post-TCJA Indicator with Firm Characteristics

	Cash ETR Profitable Subsample				Δ*MVA* Profitable Subsample				Δ*MVA* Full Sample			
	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)
EBIT	**0.6249**	**0.6277**	**0.3496**	**−0.3887**	**−0.1493**	**−0.0813**	**−0.0459**	**−0.0202**	**−0.2783**	**−0.2786**	**−0.2783**	**−0.2797**
	(5.23)	**(5.31)**	**(3.13)**	**(−3.63)**	**(−15.69)**	**(−12.94)**	**(−7.58)**	**(−3.61)**	**(−58.58)**	**(−61.22)**	**(−55.09)**	**(−60.01)**
SIZE	−0.0021	**−0.0057**	**−0.0066**	**−0.0096**	−0.0002	**−0.0004**	**−0.0004**	**−0.0004**	−0.0001	**−0.0003**	**−0.0004**	**−0.0010**
	(−1.52)	**(−4.08)**	**(−5.05)**	**(−6.26)**	(−1.72)	**(−5.87)**	**(−6.07)**	**(−6.60)**	(−1.49)	**(−3.90)**	**(−4.72)**	**(−9.61)**
LEV	**−0.1930**	**−0.1615**	**−0.0950**	−0.0046	**−0.0034**	−0.0005	**0.0012**	0.0008	**0.0074**	**0.0094**	**0.0096**	**0.0132**
	(−7.92)	**(−6.12)**	**(−3.92)**	(−0.16)	**(−1.95)**	(−0.37)	**(1.65)**	(0.78)	**(8.47)**	**(9.40)**	**(9.45)**	**(8.31)**
PostTCJA	−0.0377	**−0.0702**	−0.0361	−0.0167	−0.0017	**−0.0034**	−0.0011	0.0017	−0.0025	**−0.0028**	**−0.0045**	**−0.0078**
	(−1.09)	**(−2.26)**	(−1.12)	(−0.28)	(−0.87)	**(−2.54)**	(−0.75)	(0.82)	(−1.74)	**(−2.25)**	**(−2.63)**	**(−3.35)**
EBIT × PostTCJA	**−0.6023**	**−0.7714**	**−0.8797**	**−1.2538**	**0.0812**	**0.0519**	**0.0214**	0.0105	**0.0986**	**0.0959**	**0.0967**	**0.0797**
	(−3.41)	**(−3.50)**	**(−3.84)**	**(−4.25)**	**(5.91)**	**(4.66)**	**(2.09)**	(0.87)	**(13.36)**	**(12.45)**	**(11.25)**	**(10.11)**
SIZE × PostTCJA	0.0002	0.0020	−0.0003	−0.0037	0.0001	**0.0002**	0.0000	0.0001	**0.0002**	**0.0003**	**0.0003**	**0.0006**
	(0.09)	(0.89)	(−0.13)	(−1.08)	(0.94)	**(1.71)**	(0.38)	(0.69)	**(2.31)**	**(2.67)**	**(2.19)**	**(3.46)**
LEV × PostTCJA	**0.0973**	0.0715	**0.0817**	0.0516	0.0020	0.0007	−0.0018	**−0.0032**	0.0010	−0.0006	−0.0018	**−0.0068**
	(2.74)	(1.44)	**(2.02)**	(0.85)	(0.76)	(0.46)	(−1.47)	**(−2.02)**	(0.67)	(−0.41)	(−1.36)	**(−3.67)**
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.183	0.153	0.132	0.115	0.187	0.143	0.111	0.101	0.296	0.315	0.359	0.448
N	4,608				4,608				9,776			

Notes: This table presents the results of quantile regressions of Δ*MVA* and *Cash ETR* on firm characteristics. Coefficient estimates report the association between each firm characteristic and cash tax preferences at the conditional quintiles of the cash tax preference distribution. We report only coefficient estimates for firm performance, size, leverage, and the postTCJA interaction term and its interaction with the reported characteristics for brevity. However, each quantile regression includes all other firm characteristics included in Equation (1) and their interactions with postTCJA. *t*-statistics are reported in parentheses. Coefficient estimates and *t*-statistics in bold represent those that are statistically different from zero with a two-tailed *p*-value of 0.10 or less. Detailed variable definitions are provided in Table 2.

Table 7

Quantile Regressions using Pretax Income to Measure Firm Performance

Quantile Regressions of Δ/MVA and Cash ETR on Firm Characteristics, an Indicator for the Post-TCJA Period, and the Interaction of the Post-TCJA Indicator with Firm Characteristics

	Cash ETR Profitable Subsample				ΔMVA Profitable Subsample				ΔMVA Full Sample			
	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)	Q(0.2)	Q(0.4)	Q(0.6)	Q(0.8)
PTI	**0.2397**	**0.2152**	−0.1843	**−0.9524**	**−0.1931**	**−0.1110**	**−0.0785**	**−0.0484**	**−0.3267**	**−0.3159**	**−0.3067**	**−0.2947**
	(2.56)	**(1.82)**	(−1.63)	**(−10.15)**	**(−27.26)**	**(−17.91)**	**(−12.59)**	**(−8.17)**	**(−140.0)**	**(−124.2)**	**(−132.9)**	**(−127.4)**
SIZE	−0.0023	**−0.0078**	**−0.0071**	**−0.0117**	−0.0002	−0.0005	−0.0004	−0.0005	**0.0002**	**0.0001**	0.0001	**−0.0003**
	(−1.78)	**(−5.49)**	**(−4.61)**	**(−6.79)**	(−2.22)	(−6.99)	(−7.01)	(−6.80)	**(3.90)**	**(2.09)**	(0.81)	**(−2.98)**
LEV	**−0.1798**	**−0.1490**	**−0.0820**	−0.0278	**−0.0097**	**−0.0039**	**−0.0023**	−0.0013	**−0.0046**	**−0.0071**	**−0.0101**	**−0.0131**
	(−8.40)	**(−5.78)**	**(−3.14)**	(−1.13)	**(−5.78)**	**(−3.44)**	**(−2.85)**	(−1.39)	**(−11.47)**	**(−13.64)**	**(−13.96)**	**(−15.01)**
PostTCJA	−0.0299	**−0.0860**	−0.0585	−0.0521	0.0011	**−0.0036**	−0.0026	0.0012	**−0.0021**	**−0.0042**	**−0.0065**	**−0.0112**
	(−0.74)	**(−2.75)**	(−1.52)	(−0.96)	(0.67)	**(−2.60)**	(−1.46)	(0.56)	**(−2.58)**	**(−3.80)**	**(−5.01)**	**(−6.24)**
PTI × PostTCJA	**−0.4278**	**−0.8423**	**−0.8672**	**−1.0627**	**0.0760**	**0.0500**	**0.0388**	0.0133	**0.1212**	**0.1137**	**0.1098**	**0.1010**
	(−2.60)	**(−4.47)**	**(−4.86)**	**(−4.74)**	**(5.25)**	**(4.17)**	**(3.99)**	(1.01)	**(39.41)**	**(34.97)**	**(31.40)**	**(29.08)**
SIZE × PostTCJA	0.0008	0.0039	−0.0003	−0.0009	0.0000	**0.0003**	0.0001	0.0001	**0.0002**	**0.0002**	**0.0003**	**0.0005**
	(0.34)	(1.60)	(−0.11)	(−0.31)	(0.31)	**(2.54)**	(0.86)	(0.59)	**(2.62)**	**(2.92)**	**(2.88)**	**(3.59)**
LEV × PostTCJA	**0.0789**	0.0261	0.0202	−0.0187	**0.0052**	0.0017	−0.0007	−0.0015	**0.0020**	**0.0025**	**0.0043**	**0.0037**
	(2.49)	(0.54)	(0.47)	(−0.35)	**(2.11)**	(1.14)	(−0.68)	(−1.00)	**(3.99)**	**(3.18)**	**(4.67)**	**(2.47)**
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R²	0.181	0.152	0.134	0.13	0.245	0.170	0.129	0.113	0.296	0.315	0.359	0.448
N	4,608				4,608				9,776			

Notes: This table presents the results of quantile regressions of ΔMVA and Cash ETR on firm characteristics when firm performance is measured using pretax income scaled by MVA. Coefficient estimates report the association between each firm characteristic and cash tax differences at the conditional quintiles of the cash tax difference distribution. We report only coefficient estimates for profitability, size, leverage, and the PostTCJA interaction term and its interaction with the reported characteristics for brevity. However, each quantile regression includes all other firm characteristics included in Equation (1) and their interactions with PostTCJA. t-statistics are reported in parentheses. Coefficient estimates and t-statistics in bold represent those that are statistically different from zero with a two-tailed p-value of 0.10 or less. Detailed variable definitions are provided in Table 2.

V. CONCLUSION

Our study contributes to the policy and popular press discussions surrounding the effect of the TCJA on the cash tax payments of U.S. corporations and to studies examining the immediate effects of the TCJA. Anecdotal evidence reported in the popular press suggests that larger, more profitable firms have lower (or zero) accounting-based ETRs following the TCJA. We use a larger, more generalizable sample of profitable firms and an alternative measure that captures cash tax differences, Δ/MVA. Average cash tax differences of profitable firms were favorable prior to the TCJA, but the TCJA significantly reduced the extent to which profitable firms are tax favored. Average cash tax differences for the full sample of profit and loss firms were unfavorable prior to the TCJA and they did not change following the TCJA.

We also employ a multivariate framework that incorporates firm characteristics, such as financial performance, into our analysis. We find that the TCJA generally did not change the effect of firm characteristics on tax preferences in a subsample of profitable firms. In the full sample of firms, we find that the TCJA attenuated the effects of profitability and leverage on scaled cash tax preferences because of the reduction in the statutory tax rate. We also find in the full sample that larger firms had less favorable tax preferences following the TCJA.

Contemporaneous studies examining the effects of the TCJA on firm behavior, such as capital structure and executive compensation decisions, generally find none. Our study sheds light on why these studies find no result in the presence of large changes to the deductibility of interest and stock compensation. Our finding that the association between firm characteristics and tax preferences did not change following the TCJA for profitable firms suggests little incentive for firms to alter their corporate policies. However, we do find evidence that the TCJA attenuated the associations between cash tax preferences and certain firm characteristics when the full sample is considered. This suggests that studies examining firm behavior should consider broader samples that include both profitable and loss firms.

We also encourage those interested in the study of corporate tax preferences to choose their measure of these preferences carefully. We provide an explanation for why the expected and empirical relation between Cash ETR and firm financial performance is theoretically ambiguous and can lead to inconsistent results across studies of tax preferences. The overall negative association between financial performance and Cash ETR documented in previous research is driven by a mechanical association between profitability and Cash ETR, where additional income shifts the ETR toward the statutory rate. We also suggest that researchers use *EBIT*, as opposed to pretax income, to control for firm performance when making inferences about leverage and tax preferences.

ACKNOWLEDGMENT

DISCLOSURE

The authors have no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

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