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ABSTRACT

The Tax Cut and Jobs Act (TCJA) slashed corporations' median effective tax rates from 31.7% to 20.8%. Nevertheless, 15% of firms experienced an increase. One fifth of firms recorded nonrecurring tax costs or benefits exceeding 3% of total assets. Proxies that existing studies employ to assess the TCJA's impacts account for just half of actual impacts. Stock prices impounded those proxies during the legislative process. Total impacts were impounded the following year, once firms published their financials. These results indicate that investors find it hard to predict even large and immediate changes to company cash flows due to unfamiliar events.

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1 Introduction

The 2017 tax reform was the first comprehensive reform of the US tax code in thirty years. The legislation, commonly referred to as the Tax Cut and Jobs Act (TCJA), changed the Internal Revenue Code in far-reaching ways. Statutory rates for both personal and corporate taxes were slashed. Various deductions were raised or lowered, introduced or eliminated. On the corporate side, our focus, the most significant changes included: a cut in the statutory tax rate from 35% to 21%, expensing of capital expenditures, changes to net operating loss (NOL) rules, a switch to territorial taxation of multinationals coupled with measures targeting income shifting by multinationals, and a one-time “deemed repatriation tax” on the unrepatriated foreign earnings of multinationals.

Although corporate tax reform had been on legislators’ agendas for over a decade, it took barely three months from the release of the “Unified framework for comprehensive tax reform” on September 27, 2017 to a final bill signed by President Trump on December 22, 2017. The combination of a short timeframe and steadily changing provisions made it difficult for firms to adjust their behavior to specific measures before the reform became law.

The reform was expected to have major financial consequences for firms, and it did. However, its breadth (detailed in Section 2) made it difficult to predict which firms would be big beneficiaries, which little, and which would actually be hurt.

This paper conducts a detailed analysis of the actual financial consequences of the TCJA for US corporations. In parallel, it investigates in detail how accurately the stock market anticipated these consequences. Prior studies used firms’ anticipatory stock price responses to assess actual consequences. By contrast, we use firms’ financial statements to directly quantify the impact of the reform. Specifically, we compare the before-and-after TCJA effective tax rates (ETRs) for each US public corporation and examine what nonrecurring charges occurred when the law was enacted.

This paper’s first contribution, detailed in Sections 3 and 4, is to show how to quantify the TJCA’s recurring and nonrecurring impact on firms, and to provide detailed descriptive evidence on its magnitude. It finds that the corporate tax reform had a large impact on firms. Between 2016 and 2018, the overall amount of corporate taxes paid went down by about 16%. The aggregate GAAP ETR across firms (that is, the sum of total tax expenses over the sum of total pre-tax

income across all firms) was 26% before the reform and 19% after. Similarly, the aggregate Cash ETR fell from 24% to 20%. However, the impact on firms was highly heterogeneous. That is true for both recurring and nonrecurring tax elements. To illustrate, from the year before the reform to the year right after, the median GAAP ETR plummeted from 31.7% to 20.8%, and the median Cash ETR fell from 21.9% to 16.7%. Most firms experienced a decrease in ETR from pre-TCJA average levels to the first post-TCJA year. However, about 15% (in the case of the GAAP ETR) or 30% (in the case of the Cash ETR) of firms experienced an increase. Notably, despite widespread concerns about disparate treatment and disparate corporate aggressiveness in tax planning before the reform, the fractional drop in the standard deviation of ETRs was less than that in the average ETR. In other words, the TCJA did not reduce inequality in ETRs.

The nonrecurring impact on firms, a critical element often neglected in discussions of the reform, was also distributed very unequally across firms. While its median and average amounts across firms were modest, 20% of firms had nonrecurring tax benefits or expenses that exceeded 3% of their total assets. Firms that did relatively well in terms of the nonrecurring impact also did well in terms of the recurring impact.

The paper's second contribution, developed in Section 5, is to analyze the factors explaining this variation in impact. It is noteworthy that although the statutory tax rate was reduced from 35% to 21%, for many firms ETRs fell considerably more than 14 percentage points, and for many firms considerably less. The reduction in ETRs tended to be larger for bigger firms. A firm's past ETR is by far the most important driver of the change to its ETR following the reform, with high-ETR firms experiencing a larger reduction in taxes. This may reflect the fact that some of the other TCJA provisions made tax planning harder for firms that previously enjoyed low ETRs. Nevertheless, proxies reflecting the TCJA's main provisions – obviously including tax rates – explain only about half of the variation in ETR changes. Even averaging across industries, differences of several percentage points in ETR changes remain after accounting for such provisions. For example, average ETRs for the medical equipment, measuring and control equipment, and electronic equipment industries fell by more than 4% above expectation. Real estate, rubber and plastic products, and printing and publishing experienced unexpected ETR increases of 4% or more.

As one would expect, the nonrecurring impact mostly affected firms with large deferred tax assets or liabilities, and those with large, previously lightly taxed, unrepatriated foreign earnings.

The remeasurement of deferred tax assets and liabilities resulted in large nonrecurring tax expenses in the defense, recreation, and trading industries, and in large tax benefits in transportation, beer and liquor, and entertainment. The largest average deemed repatriation taxes are found in apparel, candy and soda, and recreation. The industries least affected by the repatriation tax are the domestically focused healthcare and real estate, as well as insurance.

The actual gains and losses for individual firms due to the TCJA can be observed to a reasonably precise extent from financial statements. This is an advantage compared to most regulatory changes, where direct observations of firm-level effects are not available. In Section 6, we capitalize on this attractive and unusual feature to analyze how effectively the stock market impounded the actual recurring and nonrecurring impacts of the TCJA. Prior studies of stock price responses to the passage of the TCJA (reviewed below) used proxies for the expected effect of the Act's various provisions as explanatory variables. Hence, they could not assess how effectively stock prices anticipated the actual effects. That question could only be answered once companies released their 2018 financial statements (or indeed, until the companies who had fiscal years that started in the course of 2018 released their financial statements). With this benefit of hindsight, we can now conduct the first assessment of the quality of the market's crystal ball as it predicted corporations' future taxes.

We find that during the passage of the TCJA, market prices reflected the proxies, but that the part of actual tax changes that is unexplained by the proxies was not significantly associated with stock returns. In other words, market participants appear to have found it too hard to fully anticipate the consequences during the passage of the TCJA. The TCJA's actual impact was highly relevant to firm value, but much of that impact was only impounded into prices as it became visible in firms' financial statements in early 2018.¹ This is striking because the stakes in getting the estimates right over the coming year were enormous.

Overall, the findings show that the TCJA, which is often portrayed as a boon for corporations, had far more complex consequences than commonly considered. Specifically, the TCJA created winners of highly varying degrees, but it also created significant losers. Moreover, tax rates remained highly unevenly distributed. Finally, even the fairly comprehensive set of proxies used

¹ The fact that the proxies do not fully explain the actual changes in effective tax rates and nonrecurring benefits and expenses is arguably also due to firms changing their behavior (e.g., by adjusting leverage) after the TCJA in order to mitigate the impact of tax increases (or maximize the benefits of tax decreases). While investors should have anticipated such moves, our evidence shows that such anticipation was at best modestly successful.

in prior scholarly studies predicts only half of the variation in firm-level TCJA impacts. The finding that market prices initially mainly reflected these proxies rather than the actual impacts raises a cautionary flag regarding the ability of market participants to readily impound the consequences of unfamiliar events into stock prices, even when those events are known unequivocally and widely publicized. Pandemics and civic disruptions are contemporary events that fall into this category.

Our analysis contributes to the growing literature on the consequences of the TCJA for firms and on how changes in tax laws affect firm value and stock market prices. Corporate taxes are conceptually of first-order importance for firm behavior and value (see the surveys by Graham (2003) and Hanlon and Heitzman (2010)). In this respect, the TCJA is “a wonderfully generous gift because it provides scores of natural experiments that could help provide credible estimates of the causal effects of tax policy” (Slemrod 2018).² Reaping the gift’s benefits, however, requires some effort. In particular, the actual benefits or losses to individual firms from the TCJA need to be estimated. A major contribution of this paper is to show how to estimate these important quantities. These actual estimates reveal that the proxies that have been used for this purpose capture only about half of the variation of the consequences to firms.

A few studies estimate the impact of the TCJA on firms. In contemporaneous work, Dyreng, Gaertner, Hoopes, and Vernon (2020) document that after tax reform, the Cash (GAAP) ETRs of public US corporations fell by 7.5 (11.4) percentage points on average. They also show that US domestic firms benefited more than US multinationals, and that the tax savings of multinationals stemmed from lower taxes on domestic operations. Thus, the switch from worldwide to nominally territorial taxation did not result in a more favorable taxation of foreign income overall. Donelson, Koutney, and Mills (2020) consider nonrecurring income taxes, both in general and after the TCJA’s enactment in particular. They find that a large part of the variation in the TCJA’s one-time impact on earnings can be explained by the prior quarter’s deferred tax assets, deferred tax liabilities, and prior-year permanently reinvested earnings.

The present study simultaneously considers both recurring and nonrecurring taxes and the relation between the two. It also decomposes nonrecurring taxes into repatriation tax and

² The TCJA also has important aggregate effects for the economy. See, for example, Auerbach (2018) and Barro and Furman (2018). These macroeconomic studies do not address heterogeneity among firms.

DTA/DTL remeasurement. This distinction proves to be important empirically, as the stock market reaction to the TCJA concentrated predominantly on the repatriation tax.

Several studies analyze specific real effects of tax law changes. That is, they assess how firms adjusted elements of their behavior in response to such changes. For such investigations, the advantage of the TCJA over previous reforms is that the law passed so quickly that companies could hardly respond in advance.³ Studies on the firm behavior consequences of the TCJA include Bennett, Thakor, and Wang (2019), Carrizosa, Gaertner, and Lynch (2019), Kalcheva, Plečnik, Tran, and Turkiela (2019), Hanlon, Hoopes, and Slemrod (2019), Luna, Schuchard, and Stanley (2019), De Simone, McClure, and Stomberg (2019), and Edwards and Hutchens (2020).⁴ Some studies, such as Beyer, Downes, Mathis, and Rapley (2019), Olson (2020), Atwood, Downes, Henley, and Mathis (2020), and Albertus, Glover, and Levine (2019) focus specifically on what firms do with repatriated foreign cash.⁵

Our analysis draws on and is relevant to all these studies given two of its major findings: First, it shows that the effects of the TCJA were very heterogeneous across firms. Second, it

³ This is important because companies also respond to *anticipated* tax changes (see, e.g., De Simone, Piotroski, and Tomy (2019) for the case of anticipated repatriation tax changes, and Hanlon and Hoopes (2014) for the case of anticipated changes to dividend tax law). Real responses such as repurchases and firm investment after earlier tax reforms are studied by, for example, Blouin and Krull (2009), Dharmapala, Foley, and Forbes (2011), and Faulkender and Petersen (2012).

⁴ Bennett, Thakor, and Wang (2019) find that highly levered companies with high income taxes reduced their leverage, and that companies increased their investments, especially if they are capital-constrained. Carrizosa, Gaertner, and Lynch (2019) find that firms affected by the limitation on interest expense deductibility introduced by the TCJA trimmed their leverage. Kalcheva, Plečnik, Tran, and Turkiela (2019) examine investments, and find no effects. Both Bennett, Thakor, and Wang (2019) and Kalcheva, Plečnik, Tran, and Turkiela (2019) find that firms increased share repurchases. Hanlon, Hoopes, and Slemrod (2019) also find increased repurchases and further show that such increases are concentrated in a small number of firms; moreover, they document that firms with the highest ETRs before the TCJA were the most likely to announce increased payments to workers and plans to increase investment. Luna, Schuchard, and Stanley (2019) find that the change in the deductibility of CEO compensation boosted base salaries, but decreased overall compensation. By contrast, De Simone, McClure, and Stomberg (2019) find no effect on either. Edwards and Hutchens (2020) find that initial public offerings following the passage of the TCJA took place at higher valuations, but less so for firms with net deferred tax assets and US-based multinational firms.

⁵ Beyer, Downes, Mathis, and Rapley (2019) find that multinational firms with greater levels of pre-TCJA foreign cash increased their post-TCJA repurchases but changed neither their dividends nor capital expenditures on average. However, firms with more foreign cash did increase their investments if they were capital-constrained. Olson (2020) documents that a finer measure of “unlocked” trapped foreign cash predicts increases in repurchases and dividends. Atwood, Downes, Henley, and Mathis (2020) find that while US firms on average conducted fewer acquisitions after the TCJA, firms that faced higher repatriation taxes prior to the TCJA conducted more as more cash became available. Albertus, Glover, and Levine (2019) estimate a dynamic model and find that the switch from worldwide to territorial taxation reduces foreign investment by 10.2% on average. More broadly related to these studies is the literature on why and how firms “stash cash abroad” (Foley, Hartzell, Titman, and Twite 2007), on foreign acquisitions (Hanlon, Lester, and Verdi 2015), on income-shifting (Dyregang and Markle 2016), the practice of placing innovation assets in foreign corporations to avoid domestic taxes (Bennedsen and Zeume 2017).

demonstrates that proxies used in several of these studies, such as the effective tax rate before the tax reform, or foreign cash holdings, only capture about half of the variation in the treatment intensity that might explain the real behavior changes of firms. This suggests that to gauge the tax consequences of changes in firm behavior documented in the aforementioned studies, future work can relate the differences between proxies and actual impacts to identifiable behavior changes.

Stock price responses around the key events leading to the passage of the TCJA were first analyzed by Wagner, Zeckhauser, and Ziegler (2018b).⁶ Kalcheva, Plečnik, Tran, and Turkiela (2019) extend these findings in a more detailed analysis. They also test (but do not find support for) the idea that financially constrained firms benefited from the TCJA. Gaertner, Hoopes, and Williams (2020) study international stock price reactions to the TCJA. Chen and Koester (2020) show that although analysts' GAAP earnings forecasts and revisions failed to incorporate the vast majority of the deferred tax adjustment that could be expected based on firms' past financials, investors did impound this adjustment into prices during the period of the TCJA's enactment. All these studies consider how investors responded to the passage of the reform using proxies based on financial variables that were observable at the time of the events. The innovation in the present study is to investigate to what extent ex ante proxies as opposed to ex post outcomes are reflected in stock prices, first up through the TCJA's passage and then thereafter.

2 Main Elements of Corporate Tax Reform

The main provisions of the corporate tax reform are:

- (i) Reduction in the statutory corporate tax rate from 35% to 21%;
- (ii) Full expensing of capital expenditures (sunsets in 20% increments between 2023 and 2027);
- (iii) Limitation of the deductibility of interest expenses to the sum of business interest income and 30% of adjusted taxable income (corresponding to EBITDA for tax years beginning after December 31, 2017 and before January 1, 2022, and to EBIT thereafter);

⁶ The last major US federal corporate tax reform dates back to 1986. Papers studying how that reform affected stock prices include McGrattan and Prescott (2005), Cutler (1988), Shevlin and Porter (1992), Downs and Hendershott (1987), Downs and Tehranian (1988), Bolster and Janjigian (1991), and Givoly and Hayn (1992). Wagner, Zeckhauser, and Ziegler (2018a) show that stock prices anticipated tax reform during the days following the surprising outcome of the 2016 Presidential election.

- (iv) Elimination of NOL carrybacks and limitation of NOL utilization to 80% of pre-NOL taxable income;
- (v) Starting in 2022, capitalization of R&D expenditures;
- (vi) Elimination of the corporate alternative minimum tax (AMT);
- (vii) Switch to territorial taxation of multinationals;
- (viii) Measures targeting income shifting by multinationals (so-called base erosion provisions), comprising the base erosion and anti-abuse tax (BEAT) and a tax on global intangible low-tax income (GILTI);
- (ix) A one-time “transition tax” on past unrepatriated foreign earnings (also called the “deemed repatriation tax”) at a rate of 15.5% if held in cash and liquid assets and at a rate of 8% if held in other assets. Foreign taxes paid on such earnings can, to a limited extent, be credited against the US tax. The tax can be paid over an eight-year period.

These changes are generally effective for tax years beginning after December 31, 2017, with three notable exceptions. First, the expensing of capital expenditures applies to property purchased and placed into service after September 27, 2017. Second, for their first tax year ending after December 31, 2017, fiscal year taxpayers are subject to a blended corporate income tax rate based on the number of days in their fiscal year that lie in 2017 (to which a 35% rate applies) and in 2018 (to which a 21% rate applies). To illustrate, a fiscal year taxpayer with a March 31 fiscal year end would face a corporate tax rate of around 31.5% for the fiscal year ending on March 31, 2018 (being a 35% rate for three quarters and a 21% rate for one quarter). Third, the deemed repatriation tax on foreign subsidiaries’ previously untaxed foreign earnings is determined as of November 2, 2017 (the date where the TCJA was introduced in the House) or December 31, 2017, whichever is higher. Importantly, the revised NOL utilization rules only apply to NOLs arising after 2017.⁷

⁷ The Coronavirus Aid, Relief, and Economic Security Act (“CARES Act”), which became law on March 27, 2020, changed certain provisions in the TCJA. First, the CARES Act eliminates the 80% taxable income limitation for NOLs utilized in taxable years beginning before January 1, 2021 and introduces a five-year carryback period for NOLs incurred in taxable years beginning after December 31, 2017 and before January 1, 2021. Second, the CARES Act increases the limitation on the deductibility of interest expenses from 30% to 50% of adjusted taxable income for taxable years beginning in 2019 and 2020. In addition, firms can elect to compute their 2020 limitation using their 2019 adjusted taxable income, which benefits companies experiencing a drop in 2020 EBITDA because of the COVID-19 pandemic. These changes occur outside our sample period and so do not affect the analysis in this paper.

As mentioned above, the comprehensiveness of the TCJA makes estimating the effect of the reform on individual firms challenging. It is even difficult to predict which would gain and which would lose, particularly in light of the sometimes massive amounts of nonrecurring tax consequences for individual firms from the reform.

3 Estimating the TCJA Impact from Financial Statements

This section provides a method to estimate the impact of the TCJA using financial statements. Throughout the paper, we consider firms that were members of the Russell 3000 index and had a stock price no less than \$5 at the beginning of our sample period (November 1, 2017). We exclude Real Estate Investment Trusts (REITs) because they pay no income tax. Most of our data are from Compustat (supplemented by Audit Analytics, Bloomberg, and CRSP in later sections). Supplementary Appendix Table A-1 provides the definitions of all variables using the mnemonics of the different databases. Table A-2 provides summary statistics of all variables.

3.1 Overview

The enactment of the TCJA has effects of two types: a recurring effect on annual taxes moving forward, and a nonrecurring effect. The recurring effect is the result of multiple factors: the lower corporate tax rate, capex expensing, limitation on interest deductibility, etc. All of these will affect a firm's effective tax rate, but how strongly will depend on that firm's situation. The nonrecurring effect arises from two sources. First, firms must remeasure their deferred tax assets and liabilities to account for the reduction in the statutory tax rate. Second, firms may be subject to the deemed repatriation tax.

Our estimation task is made feasible by a provision in the GAAP rules that says that the effect of any changes in tax laws should be recorded in the financial statements in the accounting period in which they are enacted. The TCJA was signed into law on December 22, 2017. Hence, the entire nonrecurring effect showed up in the accounting period including that date. The annual recurring effect showed up in the financials of the following tax year. (A minor exception is the capitalization of R&D expenditures, which only takes effect in 2022.)

They also clearly were not anticipated. Future work will be able to analyze consequences of and market responses to these new provisions.

3.2 *Recurring effects*

Given the GAAP rules, the recurring effect of the TCJA on a given firm can be computed as the change in its effective tax rate between the first fiscal year beginning after the enactment of the reform and the last (or last five) fiscal year(s) ending before the enactment of the reform. For example, for calendar year taxpayers, the magnitude of the recurring effect can be assessed using the change in the ETR between 2016 and 2018. Note that it is essential to leave out 2017 when quantifying the recurring effect because the nonrecurring effects will be recorded in that year.

3.3 *Nonrecurring effects*

Firms have to report the nonrecurring effect of the reform in the financial statements for the accounting period containing December 22, 2017. The overall nonrecurring effect is included in “nonrecurring income taxes”, which is disclosed by many firms and is available in the quarterly Compustat file. This field also contains other nonrecurring tax items, such as audit settlements. However, for the quarter including December 22, 2017, this field likely provides a reasonably reliable estimate of the overall nonrecurring effect of the TCJA on firms. First, there were 3,600 such items during the quarter in which the reform was enacted, versus fewer than 500 per quarter during the remainder of the 2016-2019 period. Second, the standard deviation of nonrecurring income taxes for the quarter including December 22, 2017 was six times larger than during the remainder of the 2016-2019 period (US\$ 1.101 billion versus US\$ 179 million).

As mentioned above, the nonrecurring effect has two components: the remeasurement of deferred tax assets and liabilities to account for the lower statutory tax rate, and the deemed repatriation tax. Some firms separately report these two values in the tax footnotes, but the format of the disclosures is not uniform.⁸ Other firms do not report these two values separately, making it necessary to estimate them. To consistently estimate the two components for all firms, we use the fact that firms have to record the deemed repatriation tax in their *current* income tax expense or benefit, while the remeasurement of deferred tax assets and liabilities is recorded in the *deferred* income tax expense or benefit.⁹ Thus, an estimate of these two components can be

⁸ Chen, Erickson, Harding, Stomberg, and Xia (2019) hand-collect data from 121 calendar year taxpayers in the S&P 500 index. Out of these 121 firms, 93 report the effect of remeasurement and the transition tax.

⁹ Note that any deferred tax liability for taxes on earnings of foreign subsidiaries that the company had recorded prior to the reform appears as a deferred tax benefit (i.e. negative deferred income tax expense for 2017). Hence, current

obtained as the difference between the values reported in the financial statements for the accounting period containing the TCJA enactment date and their expected values (described below) without the nonrecurring effect.

3.3.1 Remeasurement of deferred tax assets and liabilities

Consider first the remeasurement of deferred tax assets and liabilities. We estimate it as the difference between the deferred tax expense or benefit in the financial statements of the enactment period (denoted 2017 for simplicity) and 21/35 of the value in the previous year (denoted 2016):

$$\text{DTA/DTL Remeasurement} = \text{Deferred taxes}_{2017} - \frac{21}{35} \text{Deferred taxes}_{2016} \quad (1)$$

The intuition behind this expression is that absent the nonrecurring effect, the deferred tax expense for 2017 would be roughly 21/35 of its value in the previous year, as the impact of any deferral arising in 2017 would be reduced by the lower tax rate. Importantly, since the reported amount refers to taxes to be paid in the future, the 21% rate would apply to both calendar year taxpayers and fiscal year taxpayers. Admittedly, our estimate is not perfect, since capital expenditures expensing kicked in on September 27, 2017. Such expensing potentially leads to an increase in the 2017 deferred tax expense driven by the recurring impact of the TCJA rather than by the nonrecurring one. As was the case for the overall nonrecurring impact, however, the variation of deferred taxes during the enactment period is much larger than that in other periods, which suggests that the exact form of the second term in (1) should have only a modest impact.¹⁰ As we show below, our estimation scheme works very well in practice.

3.3.2 Deemed repatriation tax

We now turn to the estimation of the deemed repatriation tax. Considering calendar year taxpayers first for simplicity, our estimate is the difference between current taxes for the year of enactment (2017) and what one would have expected these taxes to be based on the firm's past effective tax rate:

year taxes will include the entire repatriation tax amount, regardless of what the firm had previously recorded in its financials.

¹⁰ In the year the TCJA went into force, the standard deviation of the deferred tax expense is 874.7 million, versus 217.7 million during the remainder of the 2016-2019 period.

$$\text{Repatriation} = \text{Current taxes}_{2017} - \text{Pretax income}_{2017} \frac{\text{Current taxes}_{2016}}{\text{Pretax income}_{2016}} \quad (2)$$

Fiscal year taxpayers, who face a blended corporate tax rate, require more complex calculations. Two approaches can be used. The first accounts for the blended rate by scaling the past ETR based on the number of months of the fiscal year containing December 22, 2017 that lie in calendar years 2017 and 2018. That produces:

$$\begin{aligned} \text{Repatriation} = & \text{Current taxes}_{2017} \\ & - \text{Pretax income}_{2017} \frac{nMonths_{2017} + \frac{21}{35} nMonths_{2018}}{nMonths_{2017} + nMonths_{2018}} \frac{\text{Current taxes}_{2016}}{\text{Pretax income}_{2016}} \end{aligned} \quad (3)$$

Importantly, this rescaling also handles the case of firms (of which there are a few in the sample) whose fiscal year has more or fewer than 12 months. This measure has the advantage of only using the past ETR. Its disadvantage is that it neglects the fact that the tax rate change does not apply to foreign income. This problem can be circumvented by using the weighted average of the ETRs in the year before and after the enactment of the reform. That leads to the estimate:

$$\begin{aligned} \text{Repatriation} = & \text{Current taxes}_{2017} \\ & - \text{Pretax income}_{2017} \frac{nMonths_{2017} \frac{\text{Current taxes}_{2016}}{\text{Pretax income}_{2016}} + nMonths_{2018} \frac{\text{Current taxes}_{2018}}{\text{Pretax income}_{2018}}}{nMonths_{2017} + nMonths_{2018}} \end{aligned} \quad (4)$$

This measure has the advantage that it is not affected by the relative importance of foreign and domestic income. Its disadvantage is that the ETR for 2018 is affected by elements of tax reform beyond the change in the statutory rate. While neither of our two estimators is perfect, their limitations seem minor in the sample, as the correlation between both measures is 0.9966. We compromise and use the average of the two values throughout our analysis.

3.3.3 Quality check

To assess the quality of these estimates, we apply the procedure above to estimate the two components for each firm using Compustat annual data and then regress the reported “nonrecurring income taxes” for the quarter containing the TCJA enactment date from the quarterly Compustat file on these estimates. If our scheme works well, the coefficient of both remeasurement and the repatriation tax estimate should be close to one. The results of this analysis are reported in Table 1. Both slopes are very close to one, and statistically indistinguishable from that value. The R^2 for the regression is above 94%, an impressive value given that nonrecurring income taxes contain items besides the nonrecurring impact of the TCJA. Hence, we are confident in the accuracy of our decomposition.

Table 1: The components of nonrecurring income taxes in the TCJA enactment year

This table presents OLS regressions of reported nonrecurring income taxes on estimates of its two components in the TCJA enactment year. The sample includes Russell 3000 firms as of November 1, 2017 whose stock price was at least \$5. Robust standard errors are shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Dependent variable:	Nonrecurring income taxes
DTA/DTL remeasurement	0.987*** (0.030)
Repatriation tax	1.033*** (0.029)
Constant	-37.946*** (7.321)
Observations	1,724
R-squared	0.946

4 Impact of the TCJA on Firms

This section employs the method developed in Section 3 to quantify the impacts of the TCJA on firms. Section 4.1 considers recurring taxes, Section 4.2 studies the nonrecurring impacts, and Section 4.3 relates these two impacts across firms.

4.1 *Impact of the TCJA on recurring taxes*

The recurring impact of the TCJA can be assessed by examining the change in a firm's effective tax rate (ETR) between the first fiscal year after the reform was enacted and the last (or last five) fiscal year(s) prior to the reform.

4.1.1 **Effective tax rates before and after the TCJA**

We rely on two standard ETR measures, the GAAP ETR and the Cash ETR. The GAAP effective tax rate (GAAP ETR) is tax expenses relative to current year pretax income. The cash effective tax rate (Cash ETR) is the percent cash taxes paid relative to current year pretax income (adjusted for special items).¹¹ The GAAP ETR is in principle more appropriate for identifying the overall effect of the TCJA than is the Cash ETR. That is because the deemed repatriation tax can be paid over an eight-year period, so the Cash ETR may well reflect these payments for several years.

Between 2016 and 2018, the aggregate GAAP ETR across firms (that is, the sum of total tax expenses over the sum of total pre-tax income across all firms) fell from 26% to 19%. Similarly, the aggregate Cash ETR fell from 24% to 20%. The aggregate amount of taxes paid decreased by about 16%.

This aggregate development is also visible when considering individual firms. Figure 1 shows the distribution of ETRs in the first post-TCJA year (solid, blue bars) compared to the typical, average 5-year ETRs before the TCJA (white bars). A massive shift to the left is evident for both the GAAP ETR and the Cash ETR. The shift is somewhat stronger for the GAAP ETR.

¹¹ As in Dyreng, Hanlon, Maydew, and Thornock (2017), we restrict the sample to those firms with positive pretax income as well as a tax rate above 0% and below 100%. We trim all ETRs at the 1% and 99% levels.

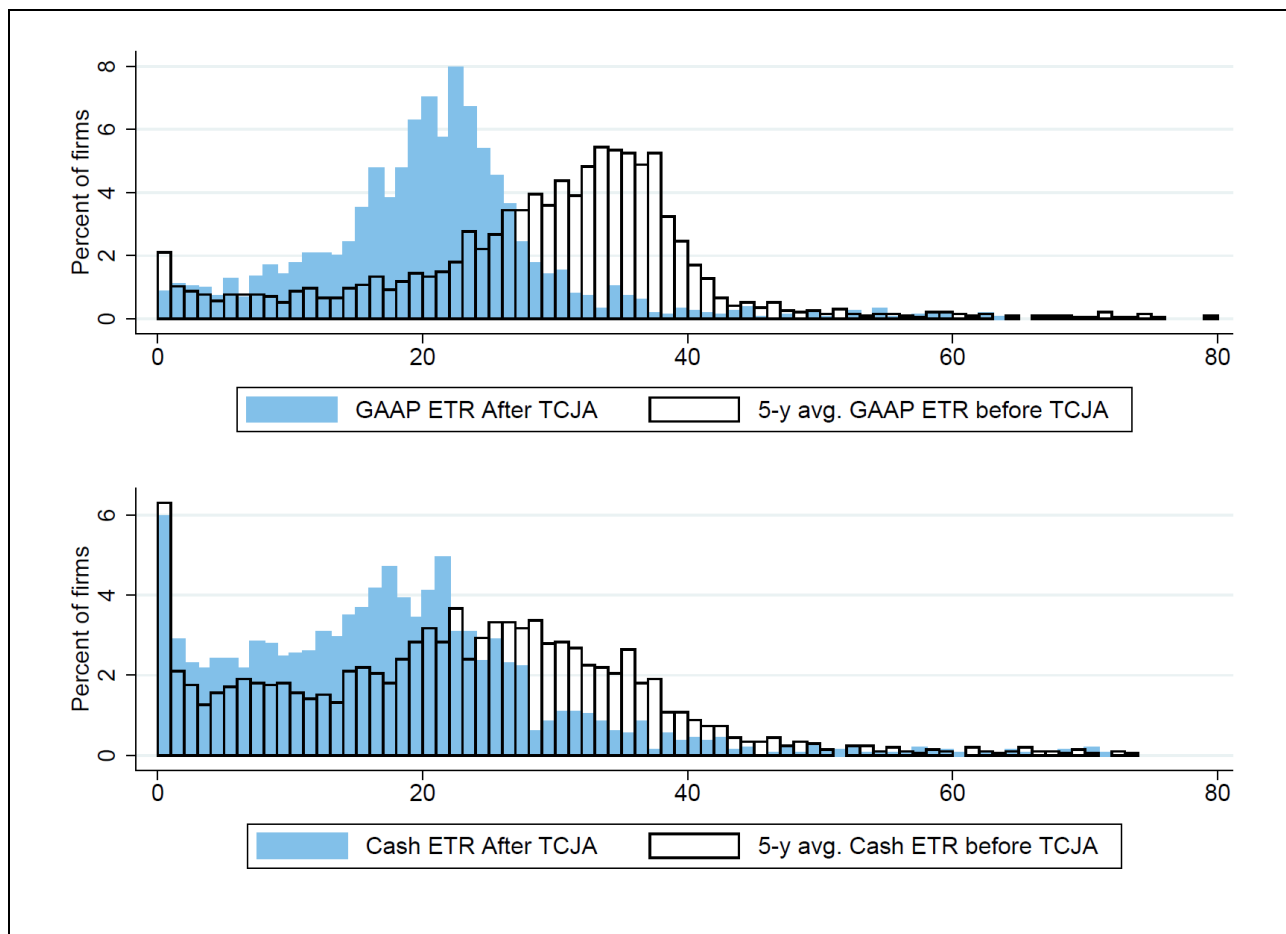


Figure 1: Effective Tax Rates before and after the TCJA

Table 2 reports the summary statistics of the GAAP and Cash ETRs for the pre-TCJA and post-TCJA periods. The median GAAP ETRs in the year and the five years before the reform were 31.65% and 30.41%, respectively. In the year following the reform, that value fell to 20.77%. The median Cash ETR fell from about 22% in both the year and the five years before the reform to less than 17% after. Notably, the coefficient of variation of the GAAP ETR after the reform ($9.10 / 20.5 = 0.44$) exceeds that before ($10.67 / 29.61 = 0.36$). This indicates that the reform did not reduce inequality in ETRs. This observation also holds for the Cash ETR.

Table 2: Descriptive statistics of effective tax rates

	N	min	p10	p25	p50	p75	p90	max	mean	sd
GAAP ETR before TCJA	1780	0	14.51	24.42	31.65	36.22	39.18	69.87	29.61	10.67
GAAP ETR, 5-year avg	2045	0	5.51	21.61	30.41	35.78	39.49	79.75	27.69	13.32
GAAP ETR after TCJA	1669	0	8.90	15.98	20.77	24.54	29.37	63.25	20.50	9.10
Cash ETR before TCJA	1765	0	3.12	12.35	21.91	31.55	38.94	74.07	22.33	13.70
Cash ETR, 5-year avg	2139	0	0.86	9.78	22.22	30.72	37.40	73.00	21.33	13.98
Cash ETR after TCJA	1669	0	2.47	8.60	16.72	23.01	30.69	71.50	17.13	11.57

4.1.2 Change in effective tax rates

The distribution of the ETR indicates that overall tax rates decreased massively, as has been widely reported. In a much less well known finding, the TCJA's various provisions actually led to *higher* tax rates for a substantial number of firms in the first post-TCJA year than in the average of the five years before the reform. Figure 2 plots histograms of the change in the GAAP and Cash ETRs at the individual firm level. Table 3 presents the descriptive statistics.

Figure 2 shows that most firms experienced a decrease in ETR from pre-TCJA average levels to the first post-TCJA year, but about 15% (in the case of the GAAP ETR) or 30% (in the case of the Cash ETR) of firms experienced an increase.

Table 3: Descriptive statistics of tax rate changes

	N	min	p10	p25	p50	p75	p90	max	mean	sd
GAAP ETR vs. previous year	1417	-36.71	-18.27	-14.30	-10.78	-5.25	1.23	25.82	-9.44	8.84
GAAP ETR vs. 5-year average	1465	-40.77	-18.87	-14.45	-10.79	-5.09	3.56	29.62	-9.16	9.85
Cash ETR vs. previous year	1396	-40.09	-20.60	-12.90	-4.64	1.93	8.89	34.04	-5.16	12.13
Cash ETR vs. 5-year average	1511	-44.13	-20.62	-13.35	-5.62	1.35	8.33	29.51	-5.89	12.01

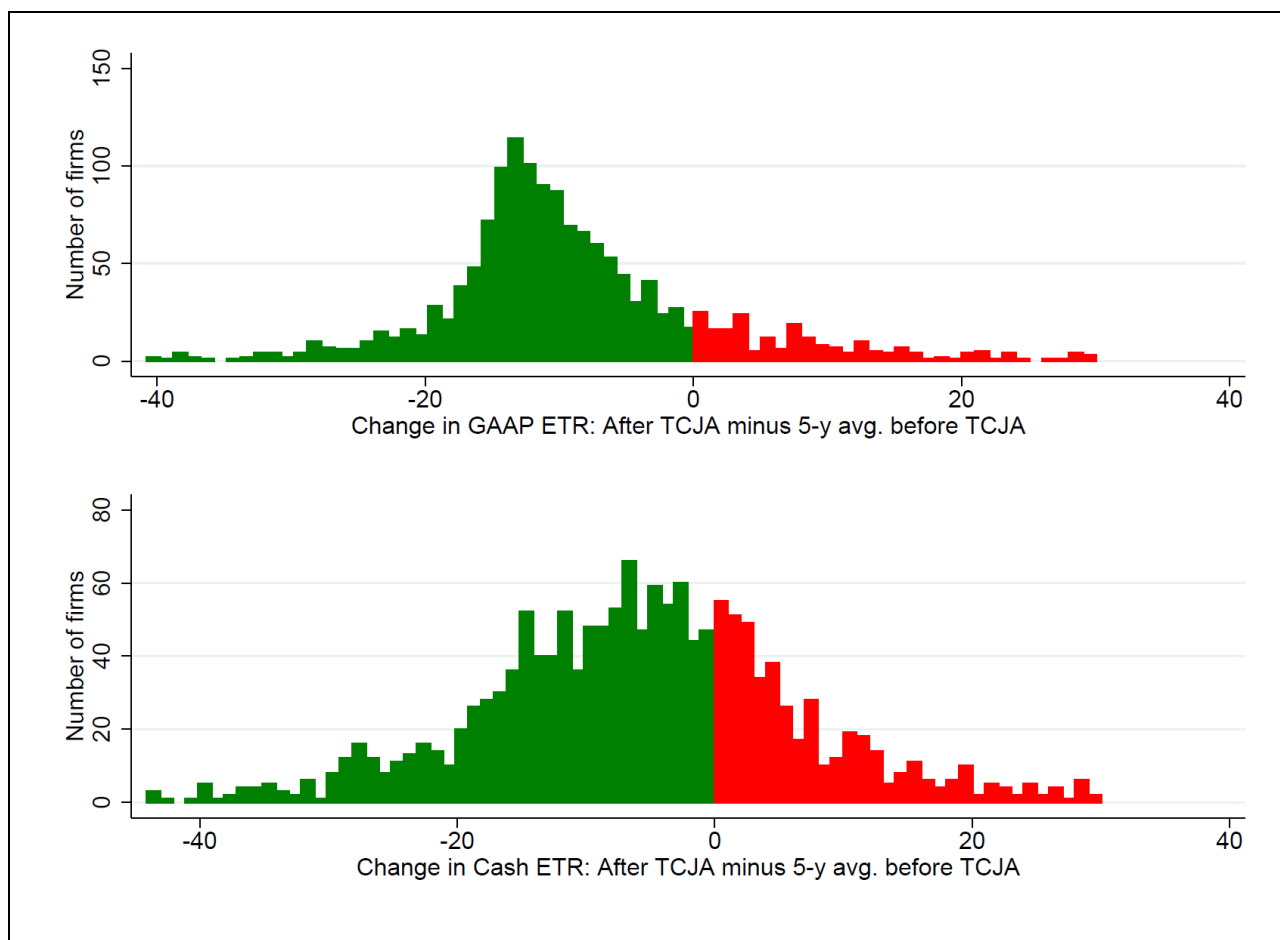


Figure 2: The distribution of Effective Tax Rates Changes

It is noteworthy that the correlation between the changes in the GAAP ETR and those in the Cash ETR are only 0.25 for the one-year change and 0.28 for the five-year change. (Supplementary Appendix Figure A-1 shows a scatter plot of the two measures for the change compared to the five-year average.) These values are surprisingly low at first glance. However, upon reflection, one would not expect a high correlation for several reasons. First, the GAAP and Cash ETRs are not that highly correlated in the first place: The correlation is 0.32 when looking at the year prior to the TCJA, and 0.52 when considering the average of 5 years before the TCJA. Second, the deemed repatriation tax is a one-off in the GAAP ETR, but is potentially spread over up to 8 years in the Cash ETR. Third, capex expensing will initially affect the Cash ETR but not the GAAP ETR as the reduction in current tax expense will be offset by an increase in deferred taxes.

4.2 Nonrecurring impact of the TCJA

Consider now the nonrecurring tax impact of the Act. Figure 3 reports the distribution of effective tax rates during the year of enactment, and of the average ETRs over the previous five years.

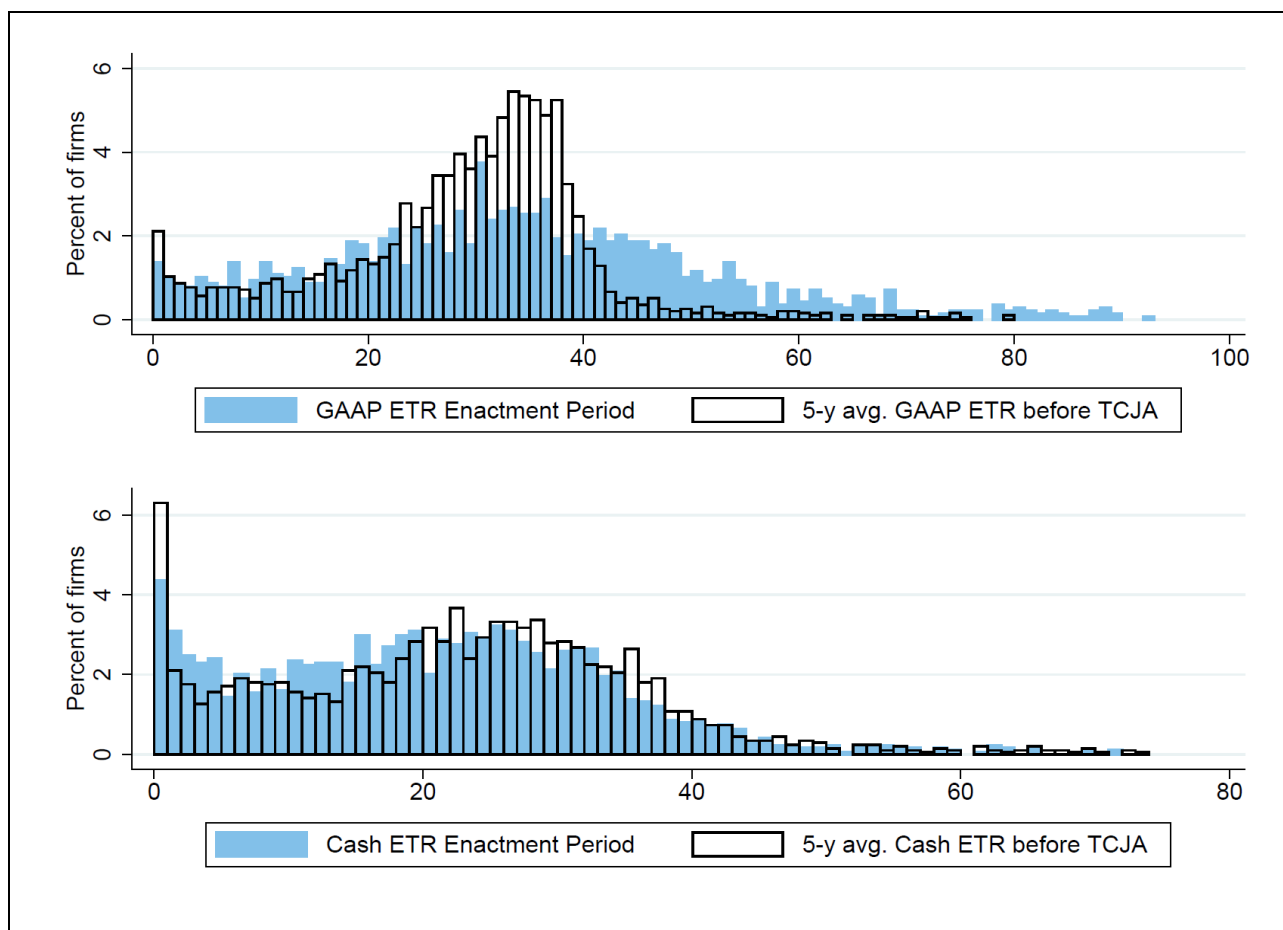


Figure 3: The distribution of effective tax rates in the year of the TCJA enactment compared to the previous five-year average

Strikingly, the nonrecurring impact resulted in very large GAAP ETRs for a sizable fraction of firms, suggesting large nonrecurring charges. By contrast, the distribution of Cash ETRs is quite similar to that during the previous five years. That similarity is expected given that both components of the nonrecurring impact have no short-term effect on cash. The remeasurement of DTAs and DTLs relates to taxes in future years, and firms can pay the deemed repatriation tax over an eight-year period.

Table 4 reveals considerable heterogeneity in the nonrecurring impact. The median firm recorded a minor nonrecurring charge of 0.04% of assets or 0.05% of pre-TCJA (September 30, 2017) equity market value. However, the firm at the 25th percentile recorded a tax benefit of 1.10% of total assets and 1.14% of market value, and the firm at the 75th percentile recorded a tax expense of 0.90% of total assets or 1.01% of market value. The 10th and 90th percentiles are -3.01% and 3.03%, respectively. Thus, 20% of firms had a nonrecurring tax expense or benefit exceeding 3% of assets, a meaningful amount.

Both components of the nonrecurring impact show considerable variability. Details of the distribution of DTA/DTL remeasurement and the repatriation tax relative to total assets are reported in Figure 4. The 25th percentile of the DTA/DTL remeasurement is a tax benefit of 1.38% of assets or 1.28% of market capitalization, while the 75th percentile is a tax expense of 0.62% of assets or 0.54% of equity value. While the distribution of DTA/DTL remeasurement is almost symmetric and centered only slightly below zero, the distribution of the repatriation tax is highly skewed. About half of firms incurred virtually no repatriation tax, but firms at the 75th percentile had a related tax expense of 0.58% of assets or 0.52% of equity value. The 90th percentile was at 1.69% of total assets or 1.62% of equity value.

Table 4: Nonrecurring income taxes and its components relative to assets and relative to market value of equity (in percent)

Relative to assets	N	min	p10	p25	p50	p75	p90	max	mean	sd
Nonrecurring income taxes	2165	-8.27	-3.01	-1.10	0.04	0.90	3.03	19.19	0.11	2.80
DTA/DTL remeasurement	2146	-10.97	-3.13	-1.38	-0.09	0.62	2.26	11.88	-0.30	2.62
Repatriation tax	1969	0	0	0	0.03	0.58	1.69	6.55	0.52	1.00
Relative to market capitalization	N	min	p10	p25	p50	p75	p90	max	mean	sd
Nonrecurring income taxes	2187	-27.59	-4.17	-1.14	0.05	1.01	2.73	24.12	-0.26	3.90
DTA/DTL remeasurement	2171	-44.62	-4.46	-1.28	-0.06	0.54	2.30	25.75	-0.68	4.79
Repatriation tax	1976	0	0	0	0.02	0.52	1.62	7.07	0.50	1.03

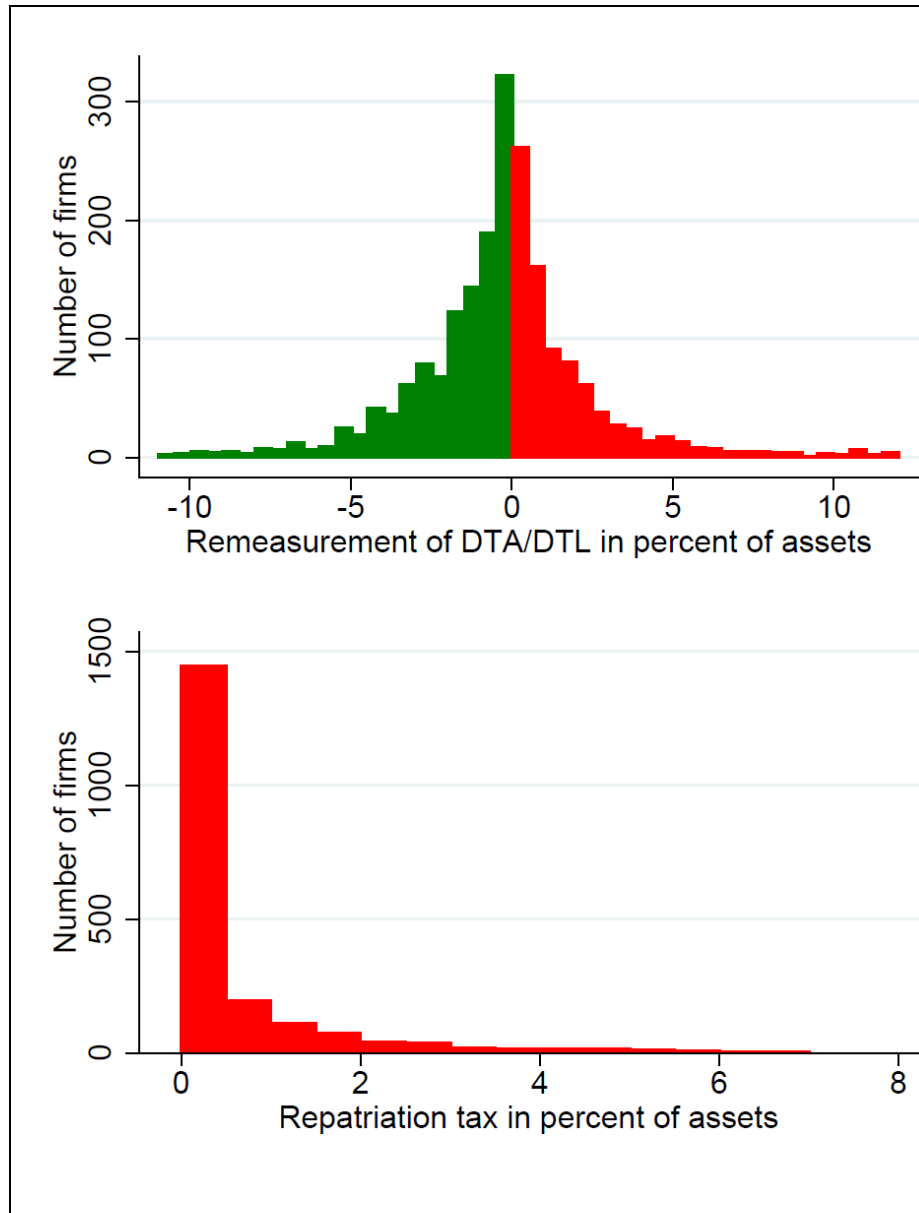


Figure 4: Distribution of the two components of the nonrecurring impact

4.3 Relation between the recurring and nonrecurring impact

Did firms that fared relatively well in terms of the nonrecurring impact also do relatively well in terms of the recurring impact? Figure 5 provides the answer. It shows a binned scatterplot of the change in the GAAP ETR against nonrecurring income taxes expressed as a portion of total assets. There is a striking and highly significant ($p < 0.01$) positive relation between the two quantities. Positive and significant relations are also found when relating the change in the GAAP

ETR to each of the two components of the nonrecurring impact. Thus, firms that did better in one area of tax changes tended to do better in each of the others. These correlations obviously do not reflect any causality. Rather, they reflect the fact that the recurring and the nonrecurring impact have a number of common determinants, the subject to which we now turn.¹²

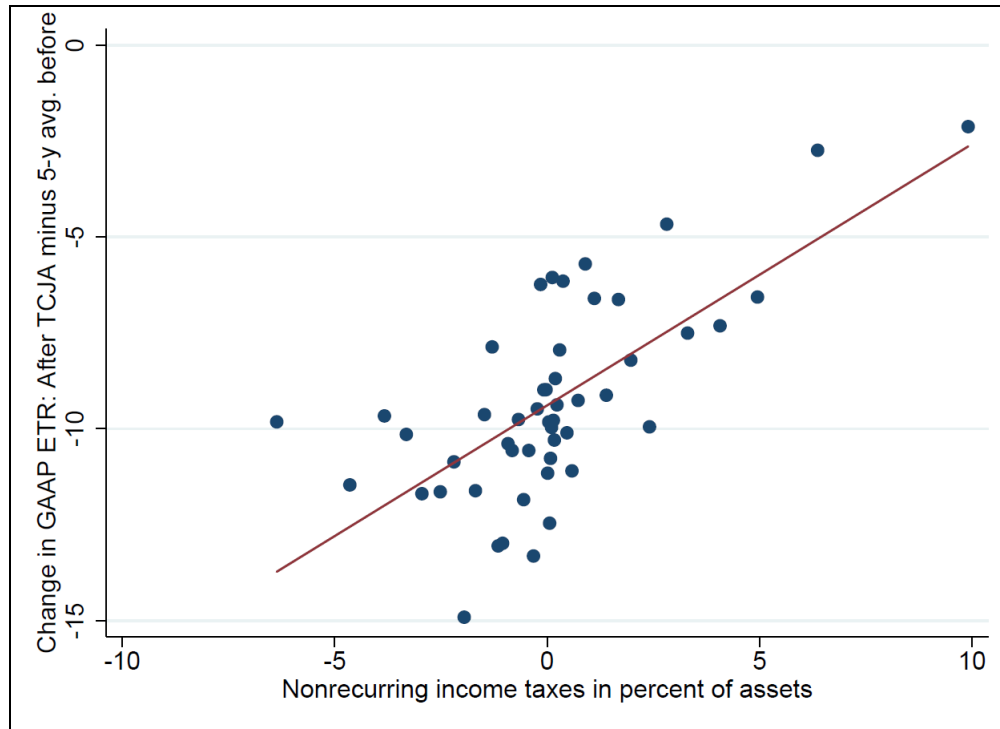


Figure 5: Empirical relationship between the recurring and nonrecurring impacts

5 Determinants of the Impact of the TCJA on Firms

Section 4 established that most firms enjoyed large tax savings on a recurring basis; many others suffered large losses. The nonrecurring impact also produced winners and losers. A natural question is: Can pre-TCJA financial statement information and firm characteristics explain who fell where? Section 5.1 answers this question for the recurring impact. Section 5.2 investigates the determinants of the Act's nonrecurring impacts on individual firms, separately considering the remeasurement of deferred tax assets and liabilities, and the deemed repatriation tax.

¹² Indeed, the positive relation between the recurring and the nonrecurring impact vanishes when controlling for the determinants considered in Section 5.

5.1 *Determinants of tax rate changes*

Table 5 presents OLS regressions of the changes in effective tax rates on features affected by the TCJA and firm characteristics (firm size, sales growth, return on assets, and industry).¹³ Panel A reports the results for the GAAP ETR. Panel B reports them for the Cash ETR.

The statutory tax rate fell from 35% to 21%. However, GAAP ETRs hardly fell by 14 percentage points across the board. The reductions tilted strongly. Firms that started with a large ETR experienced a larger decline. This may reflect the fact some of the other TCJA provisions made tax planning harder for previously low-taxed firms.

A firm's past ETR is by far the most important driver of the change in its ETR from before to after reform. This pattern prevails for both the GAAP ETR and the Cash ETR, in all specifications. Moreover, the coefficient values vary little when adding other explanatory and control variables. Those variables include proxies for other TCJA provisions (columns (2) and (3)), controls for firm characteristics (columns (4)-(6)), and industry fixed effects (columns (7)-(9)).

Although industry fixed effects explain part of the ETR change, they contribute relatively little. As can be seen in columns (7)-(9), adding Fama-French 48 industry fixed effects to the specification only slightly enhances R^2 values.¹⁴

Turning to the other explanatory variables and TCJA provisions, firms with a large share of foreign revenue experienced a relative tax increase. This reflects two factors: foreign profits do not directly benefit from the reduced US statutory tax rate, and the Act contained various anti-income-shifting provisions.¹⁵

Limitations on interest expense deductibility have no discernible impact on ETR changes. This finding probably arises because this provision only affects about 11% of firms in the sample. ETR changes are also unrelated to NOL carryforward balances. The reason is that, as noted in Section 2, the revised NOL utilization rules do not apply to pre-2018 balances.

¹³ For robustness, we also estimated all regressions including market leverage as an additional control. The results change little.

¹⁴ Regressing ETR changes on industry fixed effects only yields R^2 values of 7.36% for the GAAP ETR and 11.28% for the Cash ETR.

¹⁵ Dyreng, Gaertner, Hoopes, and Vernon (2020) conduct a detailed comparison of the TCJA's impact on domestic and US multinational firms. They show that the combination of the switch to territorial taxation and the introduction of the anti-income-shifting provisions left the US federal tax burden on foreign income essentially unchanged.

As one would expect, large capital expenditures led to a reduction in the Cash ETR, but had no effect on the GAAP ETR. This reflects the fact that capex expensing defers taxes, but does not affect overall tax expense over an asset's life as recorded in accord with GAAP rules.

Firms with high R&D expenditures experienced a stronger decrease in ETRs. This may be surprising at first, as R&D capitalization would boost cash taxes, and that clause does not kick in until 2022. To some extent, this result reflects R&D tax credit rules: if a firm has large R&D expenses, that credit will now offset a larger chunk of its pre-credit taxes. That is, in relative terms that firm gains more than would another firm with the same ETR before the reform but with little or no R&D.

Finally, large firms enjoyed a larger reduction in tax rates than did small ones. That finding strengthens when foreign revenue is included, reflecting the fact that larger firms tend to be more internationally oriented.

While the signs on the coefficients of these various proxies make sense, it is noteworthy that even the most complete specification explains just half of the variation in the actual recurring ETR change. In other words, half of the actual effects of the TCJA come from firm-specific factors that scholars have hitherto not considered. This could reflect both intricacies of the tax code and changes in firm behavior (e.g., adjustments in leverage) after the TCJA. It is conceivable that investors and analysts, too, focused on these proxies, imperfect as they were; alternatively, it is conceivable that they could indeed observe or predict the firm-specific factors driving actual impacts. The analysis in Section 6 investigates this issue further by comparing how proxies and actual ETR changes were impounded into stock prices over time.

As noted above, industries are not the primary determinant of ETR changes. Nevertheless, it is instructive to consider the average ETR change by industry. The results are reported in Panel A of Figure 6. All industries experienced a decrease in ETR. Of industries with at least five firms in the sample, utilities, retail, and transportation enjoyed the largest reductions. Textiles, mining, and printing and publishing received the smallest decreases.¹⁶ As can be seen in Panel B, controlling for the pre-TCJA effective tax rate, foreign revenue, and firm characteristics (firm size, sales growth, and ROA) leads to a very different conclusion. (We include these variables, but not the proxies for the other TCJA provisions as those provisions could have been targeting specific industries.) Of industries with at least five firms in the sample, medical equipment,

¹⁶ There are only two coal firms and three agriculture firms in the sample.

measuring and control equipment, and electronic equipment become the biggest winners. Real estate, perhaps surprisingly, and rubber and plastic products as well as printing and publishing are the biggest losers. Most importantly, as Panel B shows, and consistent with Table 5, a range of several percentage points in the actual differences in ETR changes across firms remains unexplained by the proxies.

Table 5: Determinants of the change in recurring taxes

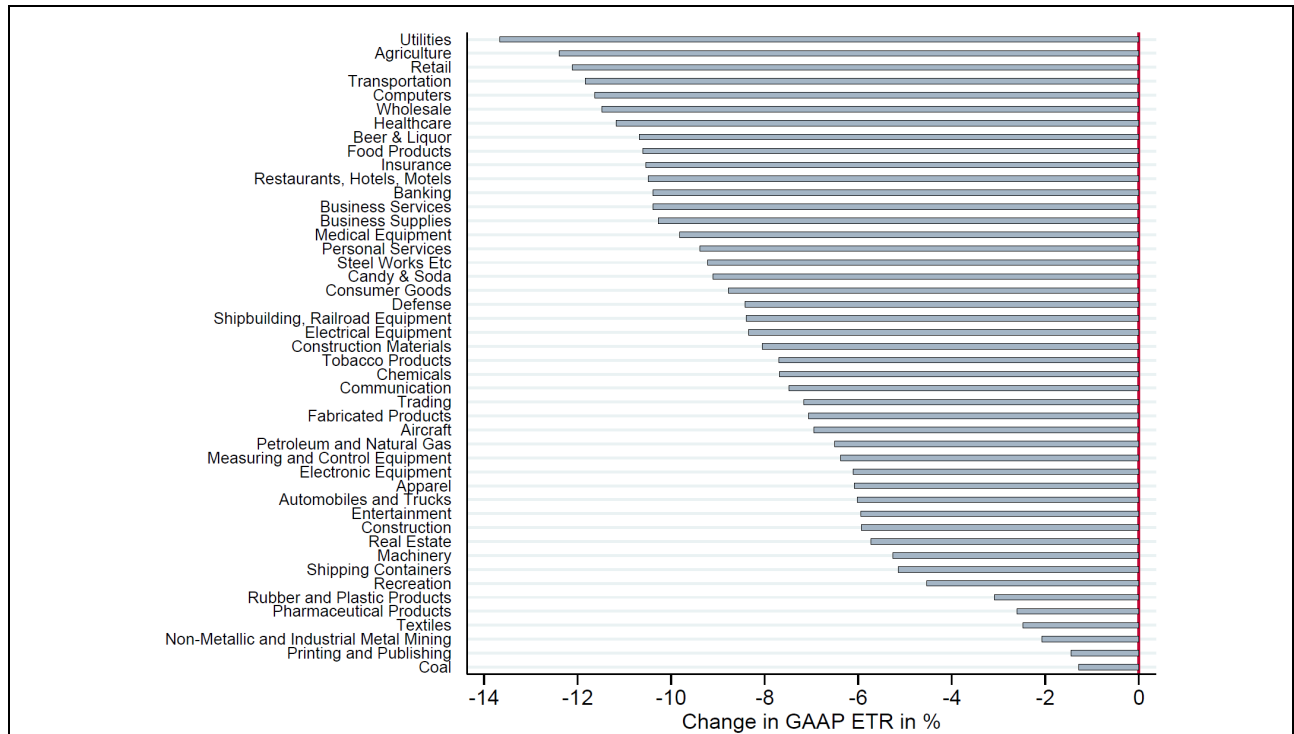
This table presents OLS regressions of changes in effective tax rates on features affected by the TCJA and firm characteristics (firm size, sales growth, return on assets, and industry). Panel A reports the results for the GAAP ETR, panel B those for the Cash ETR. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. All variables are defined in Supplementary Appendix Table A-1. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: GAAP ETR

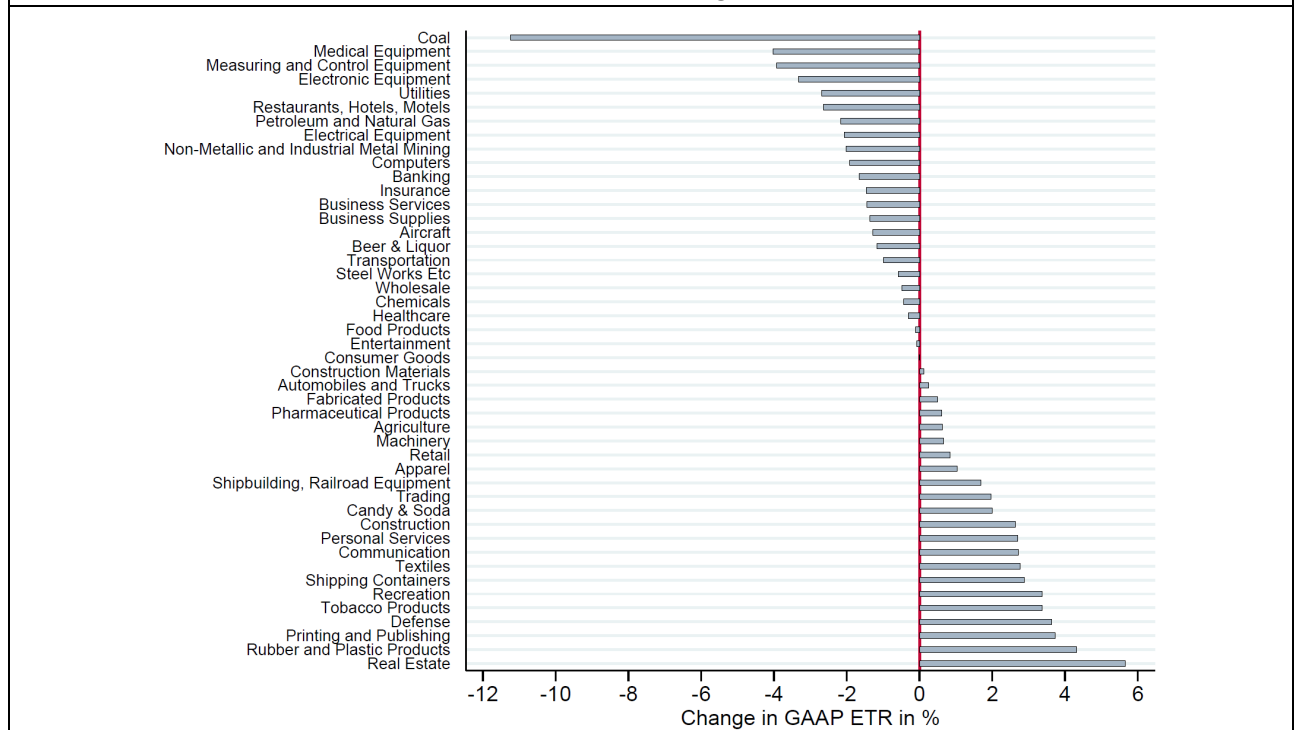
Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Change in GAAP ETR: After TCJA minus 5-y avg. before TCJA								
5-year avg. GAAP ETR	-0.655*** (0.022)	-0.645*** (0.026)	-0.643*** (0.026)	-0.665*** (0.023)	-0.646*** (0.027)	-0.651*** (0.027)	-0.672*** (0.024)	-0.660*** (0.027)	-0.660*** (0.026)
Percent foreign revenue		0.027*** (0.009)	0.044*** (0.010)		0.035*** (0.010)	0.049*** (0.011)		0.040*** (0.012)	0.049*** (0.011)
Firm's interest deductibility curtailed			1.323 (1.283)			1.489 (1.277)			1.784 (1.234)
Tax loss carryforwards in % of assets			0.006 (0.015)			0.007 (0.016)			0.002 (0.015)
Capital expenditures in % of assets			-0.086 (0.054)			-0.094* (0.055)			-0.087 (0.070)
R&D expenditures in % of assets			-0.524*** (0.081)			-0.520*** (0.080)			-0.525*** (0.087)
R&D missing			-1.005** (0.478)			-0.859* (0.493)			-0.506 (0.665)
Ln (market value of equity)				-0.303** (0.118)	-0.464*** (0.130)	-0.403*** (0.125)	-0.291** (0.123)	-0.451*** (0.134)	-0.384*** (0.129)
Sales growth				-0.001 (0.011)	0.004 (0.012)	-0.006 (0.012)	0.006 (0.012)	0.007 (0.013)	-0.012 (0.011)
ROA				0.030 (0.023)	0.018 (0.024)	0.053** (0.026)	-0.025 (0.027)	-0.016 (0.027)	0.016 (0.027)
Constant	10.223*** (0.705)	9.275*** (0.912)	10.259*** (0.975)	12.723*** (1.287)	12.699*** (1.386)	13.180*** (1.362)	13.249*** (1.314)	13.159*** (1.417)	13.456*** (1.411)
Observations	1,465	1,292	1,278	1,460	1,289	1,276	1,460	1,289	1,276
R-squared	0.422	0.448	0.461	0.420	0.448	0.464	0.459	0.481	0.498
Industry FE	No	No	No	No	No	No	Yes	Yes	Yes

Panel B: Cash ETR

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Change in Cash ETR: After TCJA minus 5-y avg. before TCJA								
5-year avg. Cash ETR	-0.631*** (0.021)	-0.599*** (0.022)	-0.627*** (0.024)	-0.648*** (0.021)	-0.617*** (0.023)	-0.645*** (0.024)	-0.648*** (0.023)	-0.622*** (0.024)	-0.641*** (0.025)
Percent foreign revenue		0.100*** (0.009)	0.095*** (0.010)		0.105*** (0.010)	0.102*** (0.011)		0.091*** (0.013)	0.094*** (0.013)
Firm's interest deductibility curtailed			-1.123 (1.948)			-0.465 (1.956)			-1.418 (1.828)
Tax loss carryforwards in % of assets			-0.020 (0.014)			-0.018 (0.014)			-0.010 (0.016)
Capital expenditures in % of assets			-0.236*** (0.077)			-0.292*** (0.078)			-0.380*** (0.097)
R&D expenditures in % of assets			-0.138* (0.071)			-0.146** (0.071)			-0.175** (0.080)
R&D missing			-1.777*** (0.578)			-1.472** (0.589)			-0.041 (0.775)
Ln (market value of equity)				0.215 (0.139)	-0.286* (0.158)	-0.326** (0.157)	0.076 (0.146)	-0.265 (0.164)	-0.323* (0.166)
Sales growth				-0.030** (0.012)	-0.012 (0.015)	-0.013 (0.016)	-0.036*** (0.012)	-0.019 (0.015)	-0.017 (0.016)
ROA				0.133*** (0.027)	0.117*** (0.027)	0.131*** (0.029)	0.057** (0.029)	0.063** (0.029)	0.080** (0.031)
Constant	8.700*** (0.489)	5.761*** (0.559)	8.606*** (0.860)	6.775*** (1.250)	7.876*** (1.333)	10.776*** (1.514)	8.532*** (1.312)	8.675*** (1.385)	10.967*** (1.590)
Observations	1,510	1,346	1,335	1,507	1,344	1,333	1,507	1,344	1,333
R-squared	0.387	0.430	0.442	0.400	0.439	0.451	0.461	0.476	0.488
Industry FE	No	No	No	No	No	No	Yes	Yes	Yes



(A) Raw change



(B) Controlling for the past 5-year average GAAP ETR, foreign revenue, firm size, sales growth, and ROA

Figure 6: Change in GAAP ETRs in percent by industry

5.2 *Determinants of nonrecurring taxes*

We now consider the drivers of the Act's nonrecurring impact on individual firms. Recall that this impact has two components: the remeasurement of deferred tax assets and liabilities, and the deemed repatriation tax.¹⁷

For the former, one would expect firms with net deferred tax liabilities in the previous year to record a nonrecurring tax benefit, and those with prior net deferred tax assets to incur a tax expense. Predicting the amount of the deemed repatriation tax based on information from prior financial statements is much more challenging. That tax is assessed on unrepatriated foreign earnings that were not previously subject to US tax (i.e., not included in subpart F income in previous years), but foreign taxes paid on such earnings can, to a limited extent, be credited against the US repatriation tax.¹⁸ In short, the requisite information for an accurate prediction is not readily available.

The TCJA requires that firms record unrepatriated foreign earnings and profits (E&P) that have not previously been subject to US tax (i.e. that were not part of the subpart F income inclusion in previous years) in their subpart F income inclusion for the last taxable year beginning before January 1, 2018. However, a deduction is allowed to the extent necessary for the foreign E&P attributable to cash and other liquid assets to be taxed at an effective rate of 15.5 percent and the remaining foreign E&P to be taxed at an effective rate of 8 percent. Foreign tax credits for the portion of earnings subject to the tax can be used to offset it. In effect, this rule means that foreign tax credits are reduced in the same proportion as income, with the consequence that the

¹⁷ Donelson, Koutney, and Mills (2019) investigate whether information from past financial statements allows predicting nonrecurring income taxes both in general, and specifically in the quarter of the TCJA's enactment. They show that DTA and DTL for the quarter preceding the TCJA's enactment and permanently reinvested earnings for the previous year strongly predict overall nonrecurring income taxes for the quarter of the TCJA's enactment. However, their analysis does not separately consider the predictability of DTA/DTL remeasurement and the deemed repatriation tax.

¹⁸ Prior to the TCJA, firms were taxed on worldwide income, but with the exception of so-called subpart F income, the taxation of foreign earnings was deferred until these earnings were repatriated back to the US. When repatriating foreign profits, firms got a credit for the foreign taxes paid on that income, but typically incurred an extra tax cost because the pre-TCJA US corporate tax rate exceeded the tax rate in virtually all countries (so that credits brought in with the distribution were usually lower than the incremental US tax before credits). Under the subpart F rules, certain types of income earned by a foreign subsidiary are taxable to the US parent in the year earned even if the foreign corporation does not distribute the income to its shareholder in that year. Broadly speaking, Subpart F income includes investment income such as dividends, interest, rents, and royalties; income from the purchase or sale of personal property involving a related person; and income from the performance of services by or on behalf of a related person.

repatriation tax cost is proportional to the difference between the US tax rate and the effective foreign tax rate.

Thus, to estimate the size of the repatriation tax cost based on past financials, we use the product of (1) the amount deemed to be repatriated under the TCJA, which we proxy by foreign earnings that were classified as indefinitely reinvested in firms' financial statements,¹⁹ and (2) the difference between the pre-TCJA US corporate tax rate of 35% and the average effective tax rate that firms paid on their foreign earnings during the previous five years:

$$\text{Repatriation tax cost} = 100 \cdot \frac{\text{Indefinitely reinvested foreign earnings}}{\text{Total assets}} \cdot \frac{\sum_{t=T-5}^{T-1} 0.35 \cdot PIFO_t - TXFO_t}{\sum_{t=T-5}^{T-1} PIFO_t}, \quad (5)$$

where PIFO denotes pre-tax foreign income and TXFO indicates foreign taxes.²⁰

Table 6 shows regressions of nonrecurring income taxes and its two components on a firm's estimated repatriation tax cost and its total net deferred tax liabilities expressed as a portion of total assets. One would not expect the TCJA provisions affecting recurring income taxes to be important drivers of nonrecurring income taxes. Nevertheless, we include them as controls to maintain consistency with the previous analyses, and to account for the effect of some provisions of the deemed repatriation tax rules discussed below.²¹ Estimating the repatriation tax cost requires data on both indefinitely reinvested earnings and foreign taxes paid. That requirement would reduce the number of observations to between about 650 and about 900 depending on the

¹⁹ Accounting rules require the US parent to record a deferred tax expense and a corresponding deferred tax liability reflecting the incremental US tax (i.e., net of the credit for foreign taxes) that will be due on foreign earnings upon repatriation. An exception to this rule applies to earnings that the company does not intend to bring back to the US. In this case, Accounting Standards Codification Section 740-10-25 provides that the company must designate the earnings as indefinitely reinvested for accounting purposes, and no deferred tax liability (nor deferred tax expense) is recorded. The result is a lower tax expense, lower GAAP ETR, and higher after-tax income than if the designation were not made. While not all unremitted foreign earnings are designated as indefinitely reinvested, Graham, Hanlon, and Shevlin (2011) survey tax executives and find that more than half of the firms in their sample designate all of their unremitted earnings as indefinitely reinvested, and that three-fourths of all accumulated foreign earnings are declared indefinitely reinvested.

²⁰ This computation follows Hanlon, Maydew, and Saavedra (2017), who also employ a long-run (five-year) measure as an alternative to the one-year measure used in Foley, Hartzell, Titman, and Twite (2007) and Lester and Verdi (2015). Since the deemed repatriation tax rate is larger for the foreign E&P attributable to cash and other liquid assets than for the remaining E&P, we also consider an alternate measure of the repatriation tax cost where the measure shown in the text is multiplied by the sum of 15.5/35 times cash holdings as a percent of assets and 8/35 times one minus cash holdings as a percent of assets. The results are very similar to those reported in Table 6.

²¹ Including both net deferred tax liabilities and NOL carryforward balances is justified both theoretically and empirically. NOL carryforward balances are reflected in deferred tax assets, but only after being multiplied by the domestic or foreign tax rate (as the case may be), and conditional on the company's assessment of whether their utilization before expiration is likely. These quantities therefore do not translate one-for-one into deferred tax assets. Empirically, NOL carryforward balances exhibit a slightly negative correlation of -0.09 with deferred tax assets and -0.05 with net deferred tax liabilities.

specification. In order to preserve the sample size, we set the repatriation tax cost to zero when missing, and mark the corresponding observations using a dummy variable. (Similar inferences are obtained when dropping firms where the repatriation tax cost is missing.)

Table 6: OLS regressions of nonrecurring income taxes and its two components

This table presents OLS regressions of nonrecurring income taxes and its two components on a firm's estimated repatriation tax cost and its total net deferred tax liabilities expressed as a portion of total assets. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. All variables are defined in Supplementary Appendix Table A-1. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Dependent variable:	(1) Nonrecurring tax expense	(2) Nonrecurring tax expense	(3) DTA/DTL Remeasurement	(4) DTA/DTL Remeasurement	(5) Repatriation tax	(6) Repatriation tax
Repatriation cost in percent of assets	0.216*** (0.025)	0.214*** (0.027)	-0.008 (0.014)	-0.012 (0.017)	0.140*** (0.016)	0.155*** (0.018)
Repatriation cost missing	-0.310*** (0.089)	0.076 (0.142)	0.131 (0.081)	-0.027 (0.109)	-0.285*** (0.044)	0.017 (0.066)
Net DTL in percent of assets	-0.290*** (0.009)	-0.314*** (0.012)	-0.300*** (0.011)	-0.338*** (0.014)	0.001 (0.003)	0.002 (0.005)
5-year avg. GAAP ETR		-0.009 (0.006)		0.005 (0.005)		0.002 (0.003)
Percent foreign revenue		0.015*** (0.004)		0.003 (0.002)		0.007*** (0.001)
Firm's interest deductibility curtailed		0.219 (0.225)		0.410** (0.191)		-0.035 (0.071)
Tax loss carryforwards in percent of assets		-0.005 (0.005)		0.001 (0.001)		-0.001*** (0.000)
Capital expenditures in percent of assets		-0.030* (0.015)		0.036** (0.015)		-0.022*** (0.007)
R&D expenditures in percent of assets		0.015 (0.020)		-0.033** (0.015)		0.012*** (0.005)
R&D missing		-0.120 (0.141)		-0.173 (0.122)		0.060 (0.064)
Ln (market value of equity)		0.025 (0.034)		0.040 (0.030)		0.037* (0.020)
Sales growth		-0.003 (0.003)		0.000 (0.001)		-0.001 (0.001)
ROA		0.015* (0.008)		-0.009 (0.006)		0.006*** (0.002)
Constant	0.410*** (0.072)	0.125 (0.349)	0.016 (0.059)	-0.223 (0.339)	0.566*** (0.039)	-0.100 (0.202)
Observations	2,128	1,560	2,107	1,497	1,917	1,350
R-squared	0.464	0.623	0.444	0.549	0.236	0.400
Industry FE	No	Yes	No	Yes	No	Yes

The results reveal that data from past financial statements enable reasonably accurate forecasts of both the overall nonrecurring tax impact and its two components.²² Net deferred tax liabilities and the estimated repatriation tax cost alone account for almost half of the variation in the nonrecurring tax expense. As one would expect, and confirming the quality of our decomposition of the nonrecurring tax expense, DTA/DTL remeasurement is almost entirely driven by a firm's net deferred tax liability position. Moreover, the repatriation tax is highly correlated with the estimated repatriation tax cost. It is noteworthy that once one accounts for the estimated repatriation cost, a firm's past ETR does not contribute to explaining the repatriation tax. The share of foreign revenue contributes to explaining the repatriation tax, reflecting the fact that foreign earnings and profits are subject to the tax whether or not firms had designated them as indefinitely reinvested for accounting purposes.²³

The perhaps surprising negative coefficient on tax loss carryforwards is explained by the fact that pursuant to the TCJA, the subpart F income inclusion on which the deemed repatriation tax is assessed can be reduced by the deficits of certain foreign subsidiaries. Thus, to the extent that some of the NOL carryforward balances carried by foreign subsidiaries reflect accumulated deficits when applying US tax rules to foreign income, they lower the repatriation tax.²⁴

Figure 7 reports average nonrecurring income taxes as a percent of total assets by industry. Among industries with at least five firms in the sample, the largest nonrecurring tax expenses arise in the electronic equipment, pharmaceutical products, and apparel industries.²⁵ The largest tax benefits (depicted as negative tax amounts) occur in transportation, food products, and communication. Considering the two components separately (see Figure 8), the remeasurement of deferred tax assets and liabilities (Panel A) resulted in large nonrecurring tax expenses in the defense, recreation, and trading industries, and yielded large tax benefits in transportation, beer and liquor, and entertainment. The largest average deemed repatriation taxes (Panel B) are found

²² The results for the overall nonrecurring tax impact are similar to those in Donelson, Koutney, and Mills (2019), who use permanently reinvested earnings instead of the expected repatriation tax cost.

²³ To take a notable example, Apple Inc. had recorded a deferred tax liability of \$36.4 billion for taxes due upon repatriation of the earnings of its foreign subsidiaries.

²⁴ This distinction is somewhat technical. NOL carryforward balances reported in firms' financial statements contain both US and foreign balances. Foreign NOL balances are computed by applying *foreign* tax rules to foreign subsidiaries' income and expenses. The accumulated deficits of foreign subsidiaries that the US parent can use to offset the income subject to the deemed repatriation tax are computed by applying *US* tax rules to foreign subsidiaries' income and expenses. Thus, these accumulated deficits are not visible in firms' reported financials, but are likely to be correlated to foreign NOL balances.

²⁵ There are only two precious metals, three agriculture, and three tobacco firms in the sample.

in apparel, candy and soda, and recreation. The industries least affected by the repatriation tax are the domestically focused healthcare and real estate, as well as insurance.

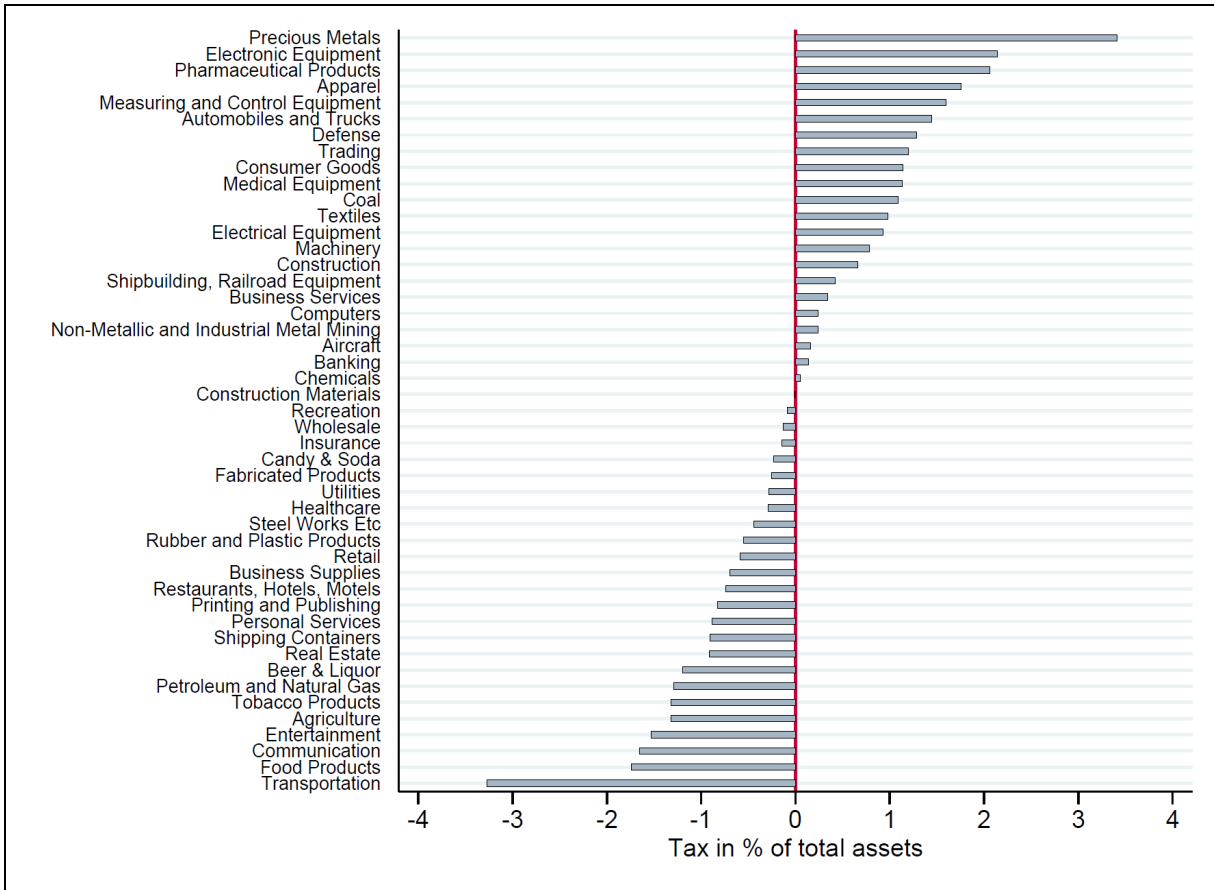


Figure 7: Average nonrecurring income taxes in percent of total assets by industry

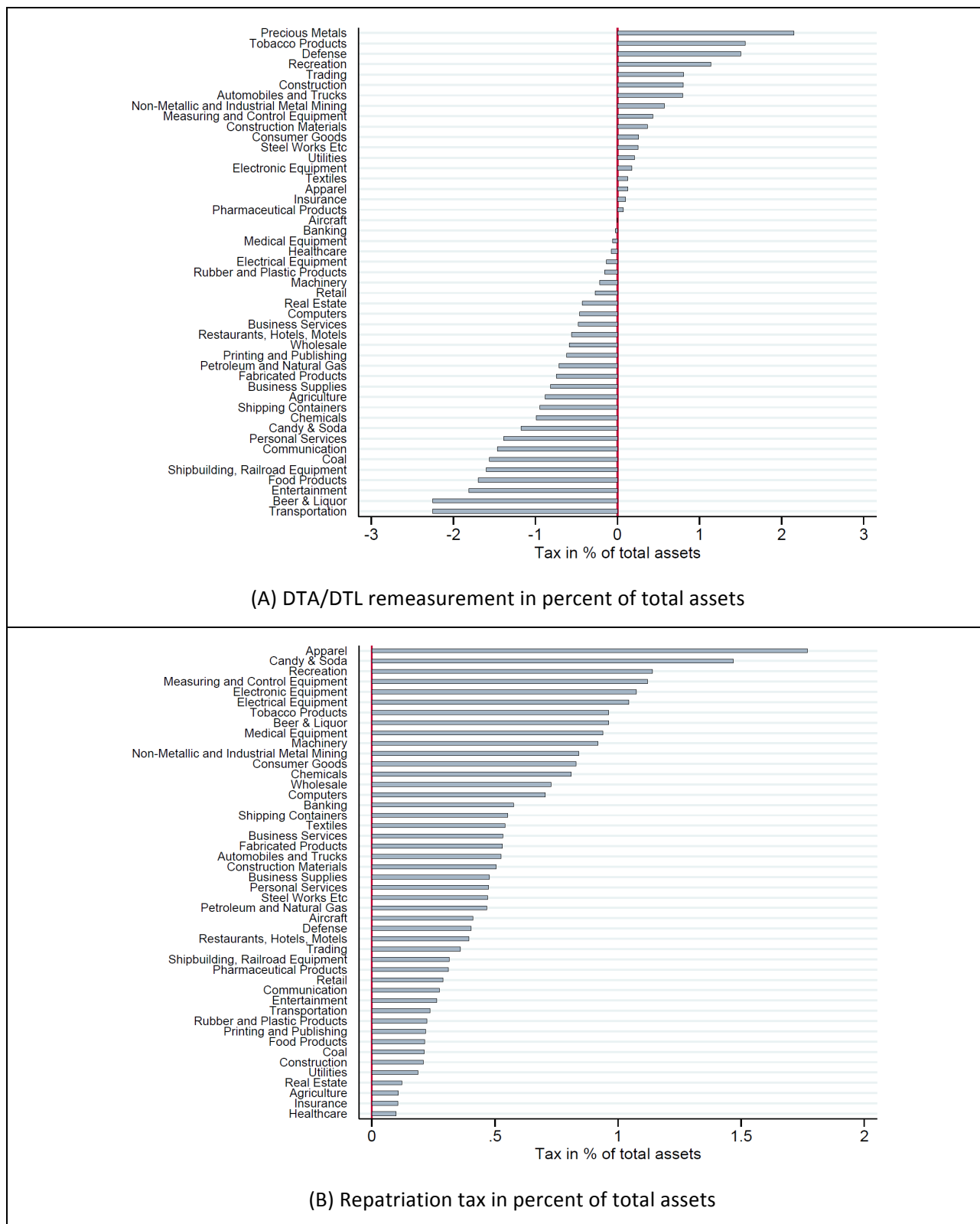


Figure 8: Components of nonrecurring income taxes in percent of total assets by industry

6 How Effective was the Market in Anticipating the TCJA's Impact?

As the introduction mentions, for a study of information processing the TCJA has the unusual feature that its actual impacts, both recurring and nonrecurring, can be quantified quite well ex post. This section assesses to what extent the market anticipated these effects by contrasting the explanatory power of ex ante available proxies for the TCJA's impacts and the ex post observable actual impacts for the cross-section of stock returns. Section 6.1 considers firms' stock price reactions as the TCJA advanced through the legislative process. Section 6.2 studies post-enactment returns.

6.1 *Returns during the TCJA passage*

To investigate stock price behavior during the TCJA passage, we use firms' cumulative returns from November 2, 2017 (inclusive) through December 22, 2017.²⁶ We primarily use CAPM-adjusted returns. The size and value factors only exhibited small moves in the time period under consideration. Indeed, CAPM-adjusted returns and returns that also control for the Fama-French size and value factors exhibit a correlation of 0.98. Table A-2 in the Supplementary Appendix shows that all inferences hold when using Fama-French-adjusted returns.

We run three specifications. The first, the "proxy" specification, employs ex ante available proxies for the expected impact of the different provisions of the TCJA on firms as explanatory variables. The second, the "actual" specification, includes the actual recurring and nonrecurring impacts of the TCJA that can be quantified ex post from financial statements as explanatory variables. The third specification conducts a horse race by including both sets of variables. If investors had better estimates of the TCJA's impact than those provided by the proxies, the coefficients of the variables capturing actual impacts should be statistically significant when included together with the proxies.

²⁶ We obtain stock return data from CRSP. To compute CAPM-adjusted returns, we first estimate each stock's market beta from an Ordinary Least Squares (OLS) regression of daily stock returns in excess of the risk-free rate on the market excess return obtained from Ken French's website for the period from September 30, 2016 through September 30, 2017 (estimation window). The risk-free rate is that from Ken French's website. We then compute abnormal returns for all days as the daily excess return on the stock minus beta times the market excess return. We compound daily returns to obtain cumulative ones. To avoid our results being affected by unstable beta estimates, we only include firms for which at least 126 daily returns are available during the estimation window. We proceed analogously to compute Fama-French-adjusted returns.

Whether industry fixed effects should be included in our setting can be debated. Conceptually, the purpose of including industry fixed effects would be to eliminate the impact on returns of factors that are unrelated to the effects under investigation. As seen in Section 5, there was substantial heterogeneity in both the recurring and nonrecurring impacts across industries. If tax reform drove average returns by industry during the period studied, including industry fixed effects might be controlling excessively. Not taking a stand, we report the results for both cases.

Table 7 shows the results, utilizing the same control variables as in the rest of the paper (profitability, log market cap, and sales growth). The coefficients on those controls are not reported for brevity. Since the variables capturing the nonrecurring impact lead to a much smaller sample size, for each of the three specifications described above, we estimate two regressions. One includes only the recurring impact, and the other includes both the recurring and the nonrecurring impact.²⁷

Consider first the “proxy” specification. The results employing proxies for the recurring impact without industry fixed effects are consistent with those reported in the literature. High-tax firms and firms with large capital expenditures benefited, while those with a large share of foreign revenue and those with large R&D expenditures lost. The finding that firms with large NOL balances outperformed may seem puzzling at first. Since the TCJA NOL rules only apply to NOLs arising after 2017, one may have expected a coefficient of zero. As mentioned in Section 6.1, however, the deficits of certain foreign subsidiaries can be used to reduce the subpart F income inclusion on which the deemed repatriation tax is assessed. Thus, to the extent that some of the NOL carryforward balances carried by foreign subsidiaries reflect accumulated deficits when applying US tax rules to foreign income, they lower the repatriation tax, and hence support a higher share price.

When including Fama-French 48 fixed effects, the past 5-year GAAP ETR is the only variable that remains significant at the 5% level. When including the proxies for the nonrecurring effect as explanatory variables, the expected repatriation tax cost is significant whether or not industry fixed effects are included. By contrast, a firm’s net DTL position is only weakly related to returns (and with an unexpected sign) in the case without fixed effects, and insignificant when fixed

²⁷ We also investigate the robustness of the findings by estimating the specifications that include only the recurring impact for the subsample of firms where the explanatory variables capturing the nonrecurring impact are also available. The results are fairly similar to those reported in Table 7, although the statistical significance of the coefficients is somewhat weaker due to the smaller sample size.

effects are included.²⁸ The addition of the proxies for the nonrecurring impact affects the coefficients on the proxies for the recurring impact only slightly; in particular, the past GAAP ETR remains significant both without and with industry fixed effects.

In the “actual” specifications, the repatriation tax is the main driver of returns, but it is only significant at the 10% level when including industry fixed effects. Similar to the “proxy” specification, the remeasurement of DTA/DTL is not significant. Surprisingly, in the case without industry fixed effects, the R^2 values are lower when using the actual impact than when using the proxies.

When both sets of explanatory variables are included, most proxies retain their significance in the specification without industry fixed effects, but the actual tax impacts become insignificant. With fixed effects included, the only significant driver of returns is the repatriation tax cost proxy. Overall, these results show that during the passage of the TCJA, investors priced the effect of tax reform using proxies rather than more precise estimates of the actual impact.

²⁸ When omitting observations with net DTL above 10% of assets, this variable is insignificantly related to returns throughout. Givoly and Hayn (1992) find that the market priced DTLs as liabilities when the corporate tax rate was cut in the 1986 reform. However, reviewing the literature overall, Graham, Raedy and Shackelford (2012) note that it is an open question whether deferred tax accounts are priced. (Holthausen and Watts)

Table 7: OLS regressions of CAPM-adjusted returns during the passage of the Tax Cuts and Jobs Act (TCJA)

This table presents OLS regressions of cumulative abnormal returns (CARs) from the introduction of the TCJA to the House (November 2, 2017) to President Trump's signing (December 22, 2017) on proxies for the different TCJA provisions, actual tax benefits/losses, and a combination. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. All variables are defined in Supplementary Appendix Table A-1. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: Without industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during the passage of the TCJA					
	"Proxy" specification	"Actual" specification			Both sets of expl.	
Proxies:						
5-year avg. GAAP ETR	0.076*** (0.029)	0.071** (0.029)			0.122*** (0.044)	0.093* (0.054)
Percent foreign revenue	-0.047*** (0.012)	-0.045*** (0.013)			-0.060*** (0.012)	-0.069*** (0.016)
Capital expenditures in percent of assets	0.294*** (0.082)	0.333*** (0.090)			0.281*** (0.080)	0.304*** (0.098)
R&D expenditures in percent of assets	-0.144** (0.072)	-0.154** (0.073)			-0.243** (0.115)	-0.262** (0.129)
R&D missing	-1.489** (0.731)	-1.497* (0.775)			-1.438* (0.779)	-0.835 (0.883)
Firm's interest deductibility curtailed	2.067 (1.733)	2.067 (1.752)			2.811* (1.671)	1.480 (1.923)
Tax loss carryforwards in percent of assets	0.019** (0.009)	0.019** (0.009)			0.010 (0.024)	0.007 (0.027)
Repatriation cost in percent of assets		-0.203** (0.084)				-0.345** (0.144)
Repatriation cost missing		0.009 (0.736)				-0.792 (0.928)
Net DTL in percent of assets		-0.110* (0.058)				-0.185** (0.076)
Actuals:						
Change in GAAP ETR			-0.068** (0.032)	-0.064* (0.038)	0.025 (0.040)	-0.003 (0.045)
Repatriation tax in percent of assets				-0.801*** (0.297)		0.357 (0.373)
Remeasurement DTL and DTA in percent of assets				-0.123 (0.137)		-0.185 (0.183)
Observations	1,724	1,694	1,447	1,077	1,264	968
R-squared	0.059	0.065	0.034	0.040	0.094	0.098
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No

Panel B: With industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during the passage of the TCJA					
	"Proxy" specification	"Actual" specification			Both sets of expl.	
Proxies:						
5-year avg. GAAP ETR	0.071** (0.028)	0.065** (0.029)			0.076* (0.044)	0.024 (0.053)
Percent foreign revenue	-0.017 (0.013)	-0.011 (0.014)			-0.035*** (0.012)	-0.021 (0.015)
Capital expenditures in percent of assets	0.121 (0.110)	0.097 (0.111)			0.114 (0.112)	0.079 (0.119)
R&D expenditures in percent of assets	-0.096 (0.075)	-0.098 (0.076)			-0.023 (0.114)	-0.025 (0.129)
R&D missing	0.110 (0.910)	0.122 (0.925)			-0.270 (1.012)	-0.166 (1.090)
Firm's interest deductibility curtailed	1.520 (1.699)	1.637 (1.714)			1.675 (1.579)	0.624 (1.726)
Tax loss carryforwards in percent of assets	0.015* (0.009)	0.014 (0.009)			-0.007 (0.024)	-0.008 (0.025)
Repatriation cost in percent of assets		-0.225*** (0.087)				-0.414*** (0.149)
Repatriation cost missing		0.291 (0.763)				0.002 (0.907)
Net DTL in percent of assets		-0.037 (0.061)				0.108 (0.097)
Actuals:						
Change in GAAP ETR			-0.055* (0.030)	-0.055 (0.035)	-0.009 (0.039)	-0.029 (0.044)
Repatriation tax in percent of assets				-0.486* (0.290)		0.217 (0.368)
Remeasurement DTL and DTA in percent of assets				0.022 (0.136)		0.290 (0.216)
Observations	1,724	1,694	1,447	1,077	1,264	968
R-squared	0.170	0.176	0.237	0.249	0.244	0.253
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 performs a similar analysis for abnormal returns on December 4, 2017, the first trading day after the Act passed in the Senate. This day is of particular interest because in light of the Republicans' slim majority in the Senate, many observers viewed the Senate vote as the "make or break" moment of the reform. Moreover, the legislative text of the Senate version differed in several important respects from the House version. Notably, the Senate version included the anti-income-shifting provisions (BEAT and GILTI) and a higher deemed repatriation tax rate (7.5% and 14.5% in the Senate version versus 7% and 14% in the House version). It also introduced the provision to capitalize R&D expenditures.

These changes are reflected in the regression coefficients in the "proxy" specification: firms with a large GAAP ETR gained, reflecting the increased likelihood of tax reform being passed; firms with a large expected repatriation tax cost, those with large foreign revenue, and those with large R&D expenditures lost. In the "actual" specification, firms with a large repatriation tax and those with a large tax cost from the remeasurement of deferred tax assets and liabilities both lost significantly. As was the case for the overall period, the market priced the repatriation tax much more strongly than it did the remeasurement of deferred tax assets and liabilities. In addition, the R^2 values are lower when using the actual impact than when using the proxies. When performing the horse race between both sets of variables, most of the proxies for the expected benefits and costs of the reform for firms remain significant. Net DTL becomes significant, but not with the expected sign. However, the variables capturing the actual impact of the reform have either much lower significance or, in the case of the change in the GAAP ETR, even have the wrong sign. This last result means that the stocks of firms that ended up facing a tax increase relative to what would have been expected based on the proxies outperformed. The cross-section of returns for the day following the Senate vote, therefore, confirms the finding that investors priced the impact of the TCJA on firms utilizing proxies rather than through more precise estimates of the actual impact.

A likely reason that investors priced stocks using proxies is that it would have been extremely cumbersome to make better estimates of the actual impact of the Act that would later materialize. If so then we would expect the part they missed to get priced in later on, as the financials became available. We now turn to this issue.

**Table 8: OLS regressions of CAPM-adjusted returns after the Senate vote
(December 4, 2017)**

This table presents OLS regressions of abnormal returns (ARs) on the first trading day following the Senate vote (December 4, 2017) on proxies for the different TCJA provisions, actual tax benefits/losses, and a combination. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. All variables are defined in Supplementary Appendix Table A-1. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: Without industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Abnormal returns (ARs) on December 4, 2017					
	"Proxy" specification	"Actual" specification		Both sets of expl.		
Proxies:						
5-year avg. GAAP ETR	0.028*** (0.006)	0.025*** (0.006)			0.051*** (0.008)	0.045*** (0.009)
Percent foreign revenue	-0.018*** (0.003)	-0.018*** (0.003)			-0.019*** (0.003)	-0.017*** (0.004)
Capital expenditures in percent of assets	0.001 (0.017)	0.004 (0.018)			-0.017 (0.017)	0.011 (0.020)
R&D expenditures in percent of assets	-0.063*** (0.013)	-0.061*** (0.013)			-0.159*** (0.024)	-0.156*** (0.026)
R&D missing	0.019 (0.128)	0.073 (0.129)			-0.199 (0.138)	-0.206 (0.150)
Firm's interest deductibility curtailed	-0.206 (0.318)	-0.191 (0.317)			0.387 (0.308)	0.646* (0.341)
Tax loss carryforwards in percent of assets	-0.000 (0.002)	-0.000 (0.002)			-0.004 (0.004)	-0.002 (0.004)
Repatriation cost in percent of assets		-0.083*** (0.019)				-0.046* (0.028)
Repatriation cost missing		-0.247* (0.147)				-0.253 (0.163)
Net DTL in percent of assets		-0.015 (0.011)				-0.033** (0.016)
Actuals:						
Change in GAAP ETR			-0.019*** (0.006)	-0.006 (0.006)	0.029*** (0.007)	0.027*** (0.008)
Repatriation tax in percent of assets				-0.401*** (0.074)		-0.119 (0.082)
Remeasurement DTL and DTA in percent of assets				-0.122*** (0.031)		-0.086* (0.045)
Observations	1,726	1,696	1,447	1,077	1,264	968
R-squared	0.162	0.176	0.022	0.084	0.197	0.215
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No

Panel B: With industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Abnormal returns (ARs) on December 4, 2017					
	"Proxy" specification	"Actual" specification		Both sets of expl.		
Proxies:						
5-year avg. GAAP ETR	0.020*** (0.005)	0.018*** (0.005)			0.038*** (0.007)	0.028*** (0.009)
Percent foreign revenue	-0.011*** (0.003)	-0.010*** (0.003)			-0.014*** (0.003)	-0.010*** (0.003)
Capital expenditures in percent of assets	0.004 (0.020)	-0.003 (0.021)			-0.022 (0.021)	-0.036 (0.022)
R&D expenditures in percent of assets	-0.032** (0.013)	-0.030** (0.013)			-0.093*** (0.023)	-0.088*** (0.023)
R&D missing	0.134 (0.149)	0.120 (0.149)			-0.083 (0.169)	-0.043 (0.180)
Firm's interest deductibility curtailed	-0.272 (0.309)	-0.236 (0.309)			0.433 (0.299)	0.559* (0.292)
Tax loss carryforwards in percent of assets	-0.001 (0.002)	-0.001 (0.002)			-0.004 (0.003)	-0.003 (0.003)
Repatriation cost in percent of assets		-0.062*** (0.018)				-0.036 (0.025)
Repatriation cost missing		-0.206 (0.151)				-0.022 (0.162)
Net DTL in percent of assets		0.007 (0.011)				0.010 (0.019)
Actuals:						
Change in GAAP ETR			-0.012** (0.006)	-0.006 (0.006)	0.018** (0.007)	0.015* (0.008)
Repatriation tax in percent of assets				-0.281*** (0.071)		-0.143* (0.080)
Remeasurement DTL and DTA in percent of assets				-0.067* (0.034)		0.021 (0.050)
Observations	1,726	1,696	1,447	1,077	1,264	968
R-squared	0.297	0.305	0.291	0.321	0.344	0.366
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

6.2 *Post-enactment returns*

As discussed above, once information on the actual impact of the TCJA becomes available to market participants, the part of that information not captured by the proxies should become reflected in stock prices. When that information becomes available differs somewhat between the recurring and the nonrecurring impact. Specifically, as discussed previously, firms have to report the nonrecurring impact in their financials for the period of the Act's enactment. Hence, that information becomes known as firms publish their quarterly results for the fiscal quarter containing December 22, 2017. That would be results for the last quarter of 2017 for calendar year taxpayers and results for quarters ending January or February 2018 for fiscal year taxpayers. Accordingly, most of the information on the nonrecurring impact can be expected to reach market participants during the first calendar quarter of 2018.

By contrast, a complete picture of the recurring impact only becomes available once firms publish their full-year financials for the first taxable year that begins after December 31, 2017. However, market participants will already obtain gleanings about the recurring impact as firms publish their first quarterly financials for quarters that end during 2018. Thus, prices during the first quarter of 2018 (as firms with quarter-ends in January or February 2018 publish their results) should start to reflect recurring impacts, and most of those impacts should be impounded in prices by the end of the second quarter of 2018 (as the results for the first quarter of 2018 for calendar year taxpayers are published).

When and to what extent did markets price in the actual impact of the Act on firms after its passage? To answer, we estimate OLS regressions of CAPM-adjusted returns for different periods on the proxies for and the actual impacts of the Act. Those regressions employ the same control variables as in Table 7. Table 9 shows the results. (Results for Fama-French-adjusted returns are in Supplementary Appendix Table A-3.) To facilitate comparison with the previous analysis, column (1) reports the estimates for the period of the TCJA's passage (corresponding to column (6) in Table 7). Columns (2)-(5) show the results for the four calendar quarters of 2018, and column (6) those for the full year 2018.

First, consider the results without industry fixed effects. Columns (1) and (2)-(5) reveal a stark contrast. During the passage of the Act, many proxies, but none of the actuals, are significantly related to returns. The opposite holds in the first quarters of 2018. Specifically, during the first quarter, firms' stock returns are negatively related to the actual change in the GAAP ETR, but the

proxies are either insignificant or (presumably because investors previously gave the proxies excess weight) have a sign opposite from what the law change would have suggested.

During the second quarter, there is again a strong negative relation between stock returns and the change in the GAAP ETR. That is, the market strongly revised downwards the value of firms that would turn out to experience higher recurring tax rates. In fact, the negative relation between the actual change in the GAAP ETR and stock returns is so strong that it proves significant in cumulative returns over the entire year 2018.

The pricing of nonrecurring items proved somewhat erratic. During the first quarter, the actual repatriation tax and the hit from the remeasurement of DTAs and DTLs affect stock returns negatively, as expected. However, the first quarter also saw a negative relation between returns and net DTL, which reversed by an equivalent amount in the fourth quarter. In the second quarter, the repatriation tax has an unexpected positive relation with returns. We do not have a compelling explanation for these counterbalancing intra-year results for nonrecurring items. Over the whole year, none of the proxies or actuals related to such items was a significant determinant of stock returns.

When including industry fixed effects, the negative relation between returns and the change in the GAAP ETR is significant at the 10% level during the first quarter, and at the 1% level in the second. In this specification as well, the negative relation between the actual change in the GAAP ETR and stock returns is significant in full-year returns. The puzzling net DTL result vanishes, whereas the surprisingly positive relation of returns with the repatriation tax in the second quarter remains, albeit with lower significance.

Overall, the results show that investors impounded the TCJA's actual impact into prices during the months following the TCJA's enactment, once that impact became visible in firms' financial statements. This was the case especially clearly and in a sustained fashion for the recurring impact of the TCJA. The findings highlight how difficult it can be for market participants to price accurately even large, immediate and continuing changes in the cash flows of a company.

Table 9: OLS regressions of CAPM-adjusted returns during the passage of the TCJA and after its enactment

This table presents OLS regressions of cumulative abnormal returns (CARs) during the passage of the TCJA (November 2, 2017 - December 22, 2017) and during 2018 on proxies for the different TCJA provisions, actual tax benefits/losses, and a combination. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. All variables are defined in Supplementary Appendix Table A-1. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: Without industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during					
	TCJA Passage	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2018
Proxies:						
5-year avg. GAAP ETR	0.093* (0.054)	-0.023 (0.078)	-0.161 (0.107)	0.009 (0.082)	0.088 (0.071)	-0.018 (0.170)
Percent foreign revenue	-0.069*** (0.016)	0.030 (0.025)	-0.052* (0.028)	-0.028 (0.024)	0.061** (0.026)	0.011 (0.053)
Capital expenditures in percent of assets	0.304*** (0.098)	-0.127 (0.128)	0.066 (0.155)	0.193 (0.141)	-0.037 (0.164)	0.096 (0.272)
R&D expenditures in percent of assets	-0.262** (0.129)	0.410** (0.183)	0.156 (0.397)	0.204 (0.154)	0.170 (0.186)	0.769** (0.331)
R&D missing	-0.835 (0.883)	-0.870 (1.031)	-0.341 (1.338)	-2.417** (0.992)	1.643 (1.036)	-1.930 (2.170)
Firm's interest deductibility curtailed	1.480 (1.923)	-3.726 (2.527)	4.310 (3.224)	-1.337 (2.478)	-6.617** (2.585)	-4.570 (5.976)
Tax loss carryforwards in percent of assets	0.007 (0.027)	-0.033 (0.024)	0.073 (0.050)	0.046 (0.034)	-0.068*** (0.025)	0.021 (0.066)
Repatriation cost in percent of assets	-0.345** (0.144)	0.236 (0.180)	-0.432* (0.231)	-0.328* (0.168)	0.519** (0.253)	-0.036 (0.444)
Repatriation cost missing	-0.792 (0.928)	0.901 (1.151)	0.491 (1.249)	-1.083 (1.101)	2.712** (1.185)	2.216 (2.379)
Net DTL in percent of assets	-0.185** (0.076)	-0.367*** (0.115)	-0.016 (0.137)	-0.016 (0.116)	0.470*** (0.118)	0.064 (0.255)
Actuals:						
Change in GAAP ETR	-0.003 (0.045)	-0.145** (0.067)	-0.337*** (0.111)	-0.069 (0.063)	0.077 (0.065)	-0.370** (0.150)
Repatriation tax in percent of assets	0.357 (0.373)	-0.903* (0.503)	2.000*** (0.595)	0.362 (0.508)	0.010 (0.621)	1.441 (1.176)
Remeasurement DTL and DTA in percent of assets	-0.185 (0.183)	-0.635** (0.289)	0.206 (0.371)	0.034 (0.315)	0.638** (0.307)	0.280 (0.618)
Observations	968	968	968	966	965	965
R-squared	0.098	0.055	0.102	0.039	0.095	0.046
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No

Panel B: With industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during					
	TCJA Passage	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2018
Proxies:						
5-year avg. GAAP ETR	0.024 (0.053)	-0.058 (0.083)	-0.120 (0.096)	0.010 (0.081)	0.051 (0.070)	-0.032 (0.170)
Percent foreign revenue	-0.021 (0.015)	0.044* (0.026)	0.001 (0.028)	-0.034 (0.024)	0.056** (0.026)	0.058 (0.054)
Capital expenditures in percent of assets	0.079 (0.119)	0.107 (0.160)	-0.294 (0.186)	0.276* (0.152)	0.272 (0.185)	0.388 (0.314)
R&D expenditures in percent of assets	-0.025 (0.129)	0.203 (0.191)	0.335 (0.424)	-0.035 (0.169)	0.014 (0.189)	0.348 (0.360)
R&D missing	-0.166 (1.090)	-3.583*** (1.277)	0.378 (1.737)	-2.173 (1.387)	1.053 (1.427)	-3.993 (2.947)
Firm's interest deductibility curtailed	0.624 (1.726)	-4.844** (2.408)	3.855 (3.559)	-0.553 (2.348)	-5.796** (2.546)	-4.228 (5.384)
Tax loss carryforwards in percent of assets	-0.008 (0.025)	-0.041 (0.025)	0.026 (0.044)	0.032 (0.034)	-0.039* (0.023)	-0.018 (0.063)
Repatriation cost in percent of assets	-0.414*** (0.149)	0.080 (0.176)	-0.322 (0.226)	-0.388** (0.180)	0.368 (0.248)	-0.311 (0.447)
Repatriation cost missing	0.002 (0.907)	1.171 (1.285)	-0.552 (1.326)	-1.750 (1.154)	1.780 (1.221)	-0.002 (2.600)
Net DTL in percent of assets	0.108 (0.097)	-0.211 (0.148)	-0.221 (0.180)	-0.172 (0.157)	0.325** (0.152)	-0.282 (0.317)
Actuals:						
Change in GAAP ETR	-0.029 (0.044)	-0.123* (0.068)	-0.274*** (0.094)	-0.059 (0.066)	0.055 (0.064)	-0.299** (0.144)
Repatriation tax in percent of assets	0.217 (0.368)	-0.817 (0.519)	1.208* (0.627)	0.225 (0.555)	0.655 (0.618)	1.410 (1.179)
Remeasurement DTL and DTA in percent of assets	0.290 (0.216)	-0.462 (0.370)	-0.264 (0.469)	-0.160 (0.403)	0.272 (0.357)	-0.546 (0.757)
Observations	968	968	968	966	965	965
R-squared	0.253	0.158	0.213	0.149	0.204	0.188
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

7 Conclusion

The 2017 Tax Cut and Jobs Act (TCJA) was the first comprehensive reform of the US tax code in thirty years. It changed the Internal Revenue Code's provisions for corporations both broadly and deeply. This study examines how the TCJA affected the taxes of individual corporations, and how investors reacted to these effects. It makes three contributions.

First, it separately quantifies the recurring and nonrecurring tax impacts of the TCJA by combining financial statement information from the pre-enactment, enactment, and post-enactment periods. Estimating the recurring impact – that is, the way the TCJA affected tax rates going forward – is straightforward. It is just the difference between firms' effective tax rates for the pre-enactment and post-enactment periods. However, calculating the TCJA's two nonrecurring impacts – that is, the one-time repatriation tax and the remeasurement of deferred tax assets and liabilities – is more challenging. We provide simple but accurate methods to estimate these two components. Contrary to naïve conjecture, quite a few firms experienced a non-trivial increase in their effective tax rates after the TCJA. Moreover, 20% of firms had substantial nonrecurring tax expenses or benefits that exceeded 3% of their total assets.

Second, it investigates how effectively proxies for the TCJA impacts used in the extant literature are able to predict the actual impacts. Proxies for these impacts – such as the prior-year(s) tax rate(s), foreign exposure, interest expenses, net DTLs, and so on – explain only about half of the variation in each of the actual effective tax rate changes, DTA/DTL re-measurement, and the repatriation tax. This leaves half unexplained. The unexplained portion of the actual impact of the TCJA reflects both intricacies of the tax code and the changes it induced in firm behaviors. The study's findings should provide a base for the growing body of research examining changes in firm behavior after the TCJA. Specifically, future work may be able to quantify the tax consequences of changes in firm behavior by relating them to the differences between the impact predicted by the proxies and those actually experienced.

Third, this study investigates how effective the market was in anticipating the actual impact of the TCJA on firms. As prior work has shown, during the passage of the TCJA, stock prices moved quite unevenly, as investors conjectured its effects and as uncertainties about its provisions were resolved. Those initial price movements show that investors relied on readily observed proxies to forecast how the TCJA would affect companies' fates and to guide their

investments. This suggests that in the face of complex legislative changes, investors resorted to these proxies to estimate those changes' consequences, presumably because they could discern no better way to estimate the actual impacts of the Act. Reinforcing this interpretation, as information on the actual impacts of the TCJA became available in early 2018, stock prices impounded the part of the actual impact the proxies failed to capture. The overarching message of the analysis is that market participants are only mildly successful in predicting the consequences of rare events that affect core elements of firms' cash flows, even when those events are widely publicized.

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Supplementary Appendix

A.1. Variable computations and descriptive statistics

Table A-1 describes the computation of our explanatory and dependent variables using the respective mnemonics from Compustat, Audit Analytics, Bloomberg, and CRSP. The data are from Compustat unless otherwise noted. Table A-2 reports descriptive statistics for tax rates (Panel A), nonrecurring tax elements (Panel B), other firm characteristics (Panel C), and stock returns (Panel D).

Table A-1: Details of variable computations

Variable	Computation
Capital expenditures in percent of assets	Capital expenditures (CAPX) divided by total assets (AT), times 100. Trimmed at the 1 st and 99 th percentiles.
Cash ETR	Cash taxes paid (TXPD) divided by pre-tax income minus special items (PI – SPI), times 100. Set to missing if pre-tax income is negative or the Cash ETR is negative or lies above 100. Trimmed at the 1 st and 99 th percentiles.
5-year average Cash ETR	Sum of cash taxes paid (TXPD) during the previous five years divided by the sum of pre-tax income minus special items (PI – SPI) over the same period, times 100. Set to missing if the resulting value is negative or lies above 100. Trimmed at the 1 st and 99 th percentiles.
DTA/DTL remeasurement	DTA/DTL remeasurement computed using equation (1) in the paper.
DTA/DTL remeasurement in percent of assets	DTA/DTL remeasurement computed using equation (1) in the paper, divided by total assets (AT), times 100. Trimmed at the 1 st and 99 th percentiles.
Firm's interest deductibility curtailed	Dummy variable equal to 1 if $(XINT > IDIT + 0.3 * EBITDA)$.
GAAP ETR	Income tax expense (TXT) divided by pre-tax income (PI), times 100. Set to missing if pre-tax income is negative or the GAAP ETR is negative or lies above 100. Trimmed at the 1 st and 99 th percentiles.
5-year average GAAP ETR	Sum of income tax expense (TXT) during the previous five years divided by the sum of pre-tax income (PI) over the same period, times 100. Set to missing if the resulting value is negative or lies above 100. Trimmed at the 1 st and 99 th percentiles.
Ln (market value of equity)	Natural logarithm of market capitalization as of September 30, 2017, computed as the product the share price and the number of shares outstanding from CRSP ($PRC * SHROUT$).

Net DTL in percent of assets	<p>Net deferred tax liabilities (DTL) divided by total assets (AT), times 100, where net DTL are computed as follows:</p> <p>(1) TXNDBL from Compustat; if missing abs(TAX_LIABILITIES_DEFERRED) from Audit Analytics;</p> <p>(2) minus TXNDBA from Compustat; if missing TAX_ASSETS_DEFERRED from Audit Analytics;</p> <p>If the result from the above is missing, field NET_DEFERRED_TAX_LIAB from Bloomberg.</p> <p>Trimmed at the 1st and 99th percentiles.</p>
Nonrecurring income taxes	Nonrecurring income taxes for the quarter of the TCJA enactment (NRTXTQ).
Nonrecurring income taxes in percent of assets	Nonrecurring income taxes for the quarter of the TCJA enactment (NRTXTQ) divided by total assets (AT), times 100. Trimmed at the 1 st and 99 th percentiles.
Percent foreign revenue	Compustat field PERC_SALES_NONUS times 100; if missing, Bloomberg field PCT_REVENUE_FROM_FOREIGN_SOURCES.
Repatriation tax	Estimated repatriation tax amount (computed using equation (2) in the paper for calendar year taxpayers and as the average of the values from equations (3) and (4) for fiscal year taxpayers).
Repatriation tax in percent of assets	Repatriation tax divided by total assets (AT), times 100. Trimmed at the 1 st and 99 th percentiles.
Repatriation cost in percent of assets	<p>Indefinitely reinvested foreign earnings from Audit Analytics (IRFE) divided by total assets from Compustat (AT), times 100, times the deviation of the average foreign effective tax rate during the previous 5 years from the pre-TCJA US statutory rate of 35%, i.e.</p> $\text{Repatriation tax cost} = 100 \cdot \frac{\text{IRFE}}{\text{AT}} \cdot \frac{\sum_{t=T-5}^{T-1} 0.35 \cdot \text{PIFO}_t - \text{TXFO}_t}{\sum_{t=T-5}^{T-1} \text{PIFO}_t}$ <p>Trimmed at the 1st and 99th percentiles.</p>
Repatriation cost missing	Dummy variable equal to 1 if the information required to compute the repatriation cost is missing.
R&D expenditures in percent of assets	R&D expenditures (XRD) divided by total assets (AT), times 100. Set to 0 if XRD is missing. Trimmed at the 1 st and 99 th percentiles.
R&D missing	Dummy variable equal to 1 if XRD is missing.
ROA	Pre-tax income (PI) divided by total assets (AT), times 100. Winsorized at the 1 st and 99 th percentiles.
Sales growth	Growth rate in SALE from the previous year in percent, $100 \cdot (\text{SALE}_t / \text{SALE}_{t-1} - 1)$. Lagged by one period if missing. Winsorized at the 1 st and 99 th percentiles.
Tax loss carryforwards in percent of assets	Tax loss carryforwards (TLCF) divided by total assets (AT), times 100. Replaced with 0 if missing. Trimmed at the 1 st and 99 th percentiles.

Table A-2: Descriptive statistics

Panel A: Effective tax rates and changes	N	min	p25	p50	p75	max	mean	sd
Cash ETR before TCJA	1765	0	12.35	21.91	31.55	74.07	22.33	13.70
Cash ETR enactment year	1745	0	10.63	20.68	29.73	71.97	20.87	13.19
Cash ETR after TCJA	1669	0	8.60	16.72	23.01	71.50	17.13	11.57
Cash ETR, 5-year avg	2139	0	9.78	22.22	30.72	73.00	21.33	13.98
Cash ETR, change vs. before TCJA	1396	-40.09	-12.90	-4.64	1.93	34.04	-5.16	12.13
Cash ETR, change vs. 5-year avg	1511	-44.13	-13.35	-5.62	1.35	29.51	-5.89	12.01
GAAP ETR before TCJA	1780	0	24.42	31.65	36.22	69.87	29.61	10.67
GAAP ETR enactment year	1395	0	21.54	32.97	44.69	92.14	33.77	18.03
GAAP ETR after TCJA	1669	0	15.98	20.77	24.54	63.25	20.50	9.10
GAAP ETR, 5-year avg	2045	0	21.61	30.41	35.78	79.75	27.69	13.32
GAAP ETR, change vs. before TCJA	1417	-36.71	-14.30	-10.78	-5.25	25.82	-9.44	8.84
GAAP ETR, change vs. 5-year avg	1465	-40.77	-14.45	-10.79	-5.09	29.62	-9.16	9.85
Panel B: Non-recurring tax elements	N	min	p25	p50	p75	max	mean	sd
DTA/DTL remeasurement	2182	-36169.60	-33.90	-0.92	10.68	24001.60	-102.33	1466.37
DTA/DTL remeasurement in % of assets	2146	-10.97	-1.38	-0.09	0.62	11.88	-0.30	2.62
Net DTL in % of assets	2502	-18.83	-0.93	0	3.14	18.82	1.02	5.27
Nonrecurring income taxes	2213	-28200.00	-25.00	0.55	20.00	22594.00	-10.22	1348.28
Nonrecurring income taxes in % of assets	2165	-8.27	-1.10	0.04	0.90	19.19	0.11	2.80
Repatriation tax	1995	0	0	0.39	13.17	36181.71	113.52	1080.49
Repatriation tax in % of assets	1969	0	0	0.03	0.58	6.55	0.52	1.00
Repatriation cost in % of assets	2560	-22.46	0.00	0	0.15	25.04	0.85	3.03
Repatriation cost missing	2560	0	0	1.00	1.00	1.00	0.63	0.48
Panel C: Other firm characteristics	N	min	p25	p50	p75	max	mean	sd
Capital expenditures in % of assets	2524	0	0.71	2.21	4.79	23.82	3.42	3.84
Firm's interest deductibility curtailed	2560	0	0	0	0	1.00	0.11	0.31
Ln (market value of equity)	2560	3.49	6.47	7.50	8.63	13.58	7.67	1.60
Percent foreign revenue	2219	0	0	11.85	41.57	100.00	23.55	28.19
R&D expenditures in % of assets	2547	0	0	0	3.03	77.17	4.16	9.47
R&D missing	2560	0	0	0	1.00	1.00	0.48	0.50
ROA	2553	-168.56	0.48	3.49	8.82	45.59	1.38	19.24
Sales growth	2504	-100.00	-1.53	5.42	15.40	312.80	11.30	38.74
Tax loss carryforwards in % of assets	2557	0	0	1.43	12.89	1127.37	27.86	85.41

Panel D: Stock returns in percent

Raw returns	N	min	p25	p50	p75	max	mean	sd
Cumulative Nov. 2 - Dec 22, 2017	2546	-52.95	-2.27	3.17	10.15	168.30	4.59	14.59
Dec. 4, 2017 (Senate vote)	2548	-37.32	-1.42	0.02	1.29	35.09	-0.14	2.84
Cumulative Q1 2018	2511	-87.41	-8.82	-0.85	7.98	128.57	0.24	17.11
Cumulative Q2 2018	2475	-65.73	-3.86	4.63	14.81	164.96	6.99	19.57
Cumulative Q3 2018	2447	-65.07	-6.35	2.47	12.69	133.80	3.70	17.50
Cumulative Q4 2018	2407	-85.77	-28.55	-18.27	-9.09	244.16	-19.13	17.50
Cumulative full year 2018	2407	-96.61	-29.97	-12.96	5.79	278.39	-10.02	33.17

CAPM-adjusted returns	N	min	p25	p50	p75	max	mean	sd
Cumulative Nov. 2 - Dec 22, 2017	2502	-55.29	-8.21	-2.63	3.88	143.27	-1.60	13.76
Dec. 4, 2017 (Senate vote)	2504	-37.16	-1.26	0.17	1.39	35.37	-0.01	2.81
Cumulative Q1 2018	2467	-86.51	-8.66	-0.78	8.07	128.77	0.33	16.90
Cumulative Q2 2018	2432	-67.46	-7.31	1.12	10.54	147.29	3.07	18.72
Cumulative Q3 2018	2405	-67.81	-12.47	-3.57	5.56	116.43	-2.91	16.14
Cumulative Q4 2018	2365	-82.76	-16.77	-5.41	4.17	285.90	-6.42	19.17
Cumulative full year 2018	2365	-96.39	-26.79	-9.51	9.84	350.67	-5.88	34.92

Fama-French-adjusted returns	N	min	p25	p50	p75	max	mean	sd
Cumulative Nov. 2 - Dec 22, 2017	2502	-52.41	-6.13	-0.59	6.23	154.67	0.85	14.39
Dec. 4, 2017 (Senate vote)	2504	-36.02	-1.17	0.04	1.23	34.47	0	2.60
Cumulative Q1 2018	2467	-87.26	-8.84	-0.53	7.74	120.15	-0.04	16.46
Cumulative Q2 2018	2432	-71.65	-10.65	-1.63	7.01	152.49	-0.98	17.85
Cumulative Q3 2018	2405	-67.84	-8.95	-0.23	8.66	114.06	0.30	16.59
Cumulative Q4 2018	2365	-79.28	-11.10	0.19	9.81	279.77	0.02	20.24
Cumulative full year 2018	2365	-96.83	-22.28	-2.43	16.06	329.30	-0.59	36.00

A.2. Relation between changes in the GAAP ETR and changes in the Cash ETR

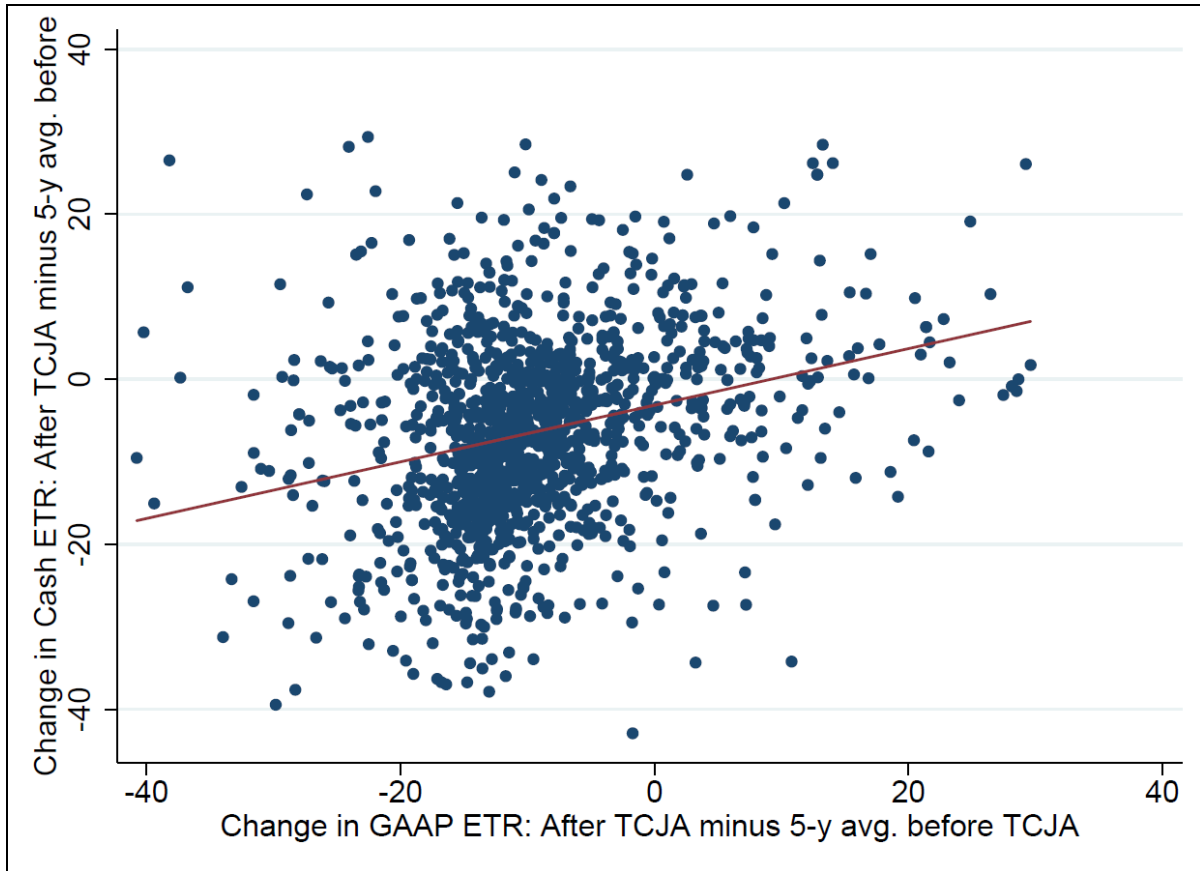


Figure A-1: Scatter plot of the change in GAAP ETR from pre-TCJA average levels to the first post-reform year against the change in Cash ETR over the same time period

A.3. Regression results using Fama-French-adjusted returns

Table A-3: OLS regressions of Fama-French-adjusted returns during the passage of the Tax Cuts and Jobs Act (TCJA)

This table presents OLS regressions of Fama-French-adjusted cumulative abnormal returns (CARs) from the introduction of the TCJA to the House (November 2, 2017) to President Trump's signing (December 22, 2017) on proxies for the different TCJA provisions, actual tax benefits/losses, and a combination. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: Without industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during the passage of the TCJA					
	"Proxy" specification	"Actual" specification		Both sets of expl.		
Proxies:						
5-year avg. GAAP ETR	0.080*** (0.029)	0.075** (0.030)			0.137*** (0.046)	0.107* (0.056)
Percent foreign revenue	-0.049*** (0.012)	-0.048*** (0.014)			-0.066*** (0.012)	-0.078*** (0.017)
Capital expenditures in percent of assets	0.283*** (0.086)	0.338*** (0.094)			0.273*** (0.084)	0.338*** (0.104)
R&D expenditures in percent of assets	-0.132* (0.077)	-0.148* (0.078)			-0.230* (0.124)	-0.260* (0.139)
R&D missing	-1.758** (0.765)	-1.716** (0.811)			-1.762** (0.816)	-1.040 (0.930)
Firm's interest deductibility curtailed	2.592 (1.813)	2.526 (1.834)			3.886** (1.779)	2.568 (2.072)
Tax loss carryforwards in percent of assets	0.020** (0.010)	0.019** (0.010)			0.005 (0.026)	0.001 (0.029)
Repatriation cost in percent of assets		-0.221** (0.087)				-0.371** (0.150)
Repatriation cost missing		-0.015 (0.773)				-0.968 (0.988)
Net DTL in percent of assets		-0.153** (0.061)				-0.271*** (0.081)
Actuals:						
Change in GAAP ETR			-0.065* (0.033)	-0.060 (0.040)	0.039 (0.042)	0.009 (0.047)
Repatriation tax in percent of assets				-0.741** (0.312)		0.472 (0.393)
Remeasurement DTL and DTA in percent of assets				-0.109 (0.142)		-0.311 (0.194)
Observations	1,724	1,694	1,447	1,077	1,264	968
R-squared	0.050	0.057	0.024	0.037	0.087	0.100
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No

Panel B: With industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during the passage of the TCJA					
	"Proxy" specification	"Actual" specification			Both sets of expl.	
Proxies:						
5-year avg. GAAP ETR	0.076*** (0.029)	0.068** (0.029)			0.087** (0.044)	0.029 (0.054)
Percent foreign revenue	-0.018 (0.013)	-0.011 (0.014)			-0.042*** (0.013)	-0.027* (0.016)
Capital expenditures in percent of assets	0.130 (0.114)	0.104 (0.116)			0.129 (0.118)	0.097 (0.125)
R&D expenditures in percent of assets	-0.097 (0.081)	-0.101 (0.082)			-0.002 (0.122)	0.003 (0.138)
R&D missing	0.175 (0.939)	0.180 (0.955)			-0.216 (1.049)	-0.077 (1.132)
Firm's interest deductibility curtailed	2.011 (1.761)	2.076 (1.781)			2.775* (1.653)	1.491 (1.826)
Tax loss carryforwards in percent of assets	0.016 (0.010)	0.014 (0.010)			-0.012 (0.025)	-0.015 (0.026)
Repatriation cost in percent of assets		-0.256*** (0.090)				-0.455*** (0.155)
Repatriation cost missing		0.399 (0.791)				0.045 (0.950)
Net DTL in percent of assets		-0.046 (0.063)				0.095 (0.101)
Actuals:						
Change in GAAP ETR			-0.056* (0.031)	-0.054 (0.037)	-0.002 (0.040)	-0.022 (0.045)
Repatriation tax in percent of assets				-0.494 (0.305)		0.296 (0.384)
Remeasurement DTL and DTA in percent of assets				0.025 (0.141)		0.286 (0.223)
Observations	1,724	1,694	1,447	1,077	1,264	968
R-squared	0.176	0.182	0.246	0.265	0.256	0.271
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A-4: OLS regressions of Fama-French-adjusted returns during the passage of the TCJA and after its enactment

This table presents OLS regressions of Fama-French-adjusted cumulative abnormal returns (CARs) during the passage of the TCJA (November 2, 2017 - December 22, 2017) and during 2018 on proxies for the different TCJA provisions, actual tax benefits/losses, and a combination. The sample includes Russell 3000 firms as of November 1, 2017 with a stock price of at least \$5. Robust standard errors are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Panel A: Without industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	TCJA Passage	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2018
Proxies:						
5-year avg. GAAP ETR	0.107* (0.056)	-0.020 (0.078)	-0.154 (0.110)	0.055 (0.086)	0.126 (0.080)	0.066 (0.184)
Percent foreign revenue	-0.078*** (0.017)	0.028 (0.025)	-0.050** (0.025)	-0.048** (0.025)	0.034 (0.028)	-0.040 (0.053)
Capital expenditures in percent of assets	0.338*** (0.104)	-0.139 (0.127)	0.003 (0.151)	0.252* (0.149)	0.108 (0.183)	0.216 (0.294)
R&D expenditures in percent of assets	-0.260* (0.139)	0.279 (0.188)	-0.211 (0.285)	-0.080 (0.161)	0.174 (0.184)	-0.029 (0.340)
R&D missing	-1.040 (0.930)	-0.469 (1.024)	0.404 (1.278)	-2.698** (1.047)	0.583 (1.138)	-2.620 (2.314)
Firm's interest deductibility curtailed	2.568 (2.072)	-3.228 (2.500)	4.535 (2.961)	-0.325 (2.753)	-6.867** (2.808)	-3.717 (6.312)
Tax loss carryforwards in percent of assets	0.001 (0.029)	-0.041* (0.023)	0.071 (0.050)	0.036 (0.035)	-0.081*** (0.026)	0.007 (0.073)
Repatriation cost in percent of assets	-0.371** (0.150)	0.192 (0.173)	-0.486** (0.225)	-0.406** (0.182)	0.489* (0.250)	-0.266 (0.456)
Repatriation cost missing	-0.968 (0.988)	1.005 (1.145)	0.649 (1.213)	-1.614 (1.126)	2.378* (1.290)	1.853 (2.468)
Net DTL in percent of assets	-0.271*** (0.081)	-0.390*** (0.114)	0.014 (0.138)	-0.179 (0.120)	0.341*** (0.127)	-0.248 (0.265)
Actuals:						
Change in GAAP ETR	0.009 (0.047)	-0.135** (0.065)	-0.323*** (0.113)	-0.032 (0.066)	0.084 (0.072)	-0.328** (0.161)
Repatriation tax in percent of assets	0.472 (0.393)	-0.973* (0.496)	1.669*** (0.584)	0.427 (0.542)	0.462 (0.649)	1.712 (1.212)
Remeasurement DTL and DTA in percent of assets	-0.311 (0.194)	-0.689** (0.288)	0.241 (0.374)	-0.194 (0.334)	0.401 (0.322)	-0.233 (0.638)
Observations	968	968	968	966	965	965
R-squared	0.100	0.043	0.067	0.039	0.064	0.046
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No

Panel B: With industry fixed effects

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Cumulative abnormal returns (CARs) during					
	TCJA Passage	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Full Year 2018
Proxies:						
5-year avg. GAAP ETR	0.029 (0.054)	-0.056 (0.083)	-0.109 (0.095)	0.037 (0.087)	0.073 (0.080)	0.021 (0.184)
Percent foreign revenue	-0.027* (0.016)	0.041 (0.026)	0.002 (0.027)	-0.050** (0.025)	0.040 (0.029)	0.026 (0.054)
Capital expenditures in percent of assets	0.097 (0.125)	0.091 (0.159)	-0.347* (0.184)	0.290* (0.158)	0.363* (0.205)	0.386 (0.333)
R&D expenditures in percent of assets	0.003 (0.138)	0.113 (0.196)	0.008 (0.302)	-0.207 (0.176)	0.081 (0.196)	-0.163 (0.358)
R&D missing	-0.077 (1.132)	-3.205** (1.277)	0.520 (1.542)	-1.939 (1.436)	0.632 (1.578)	-3.947 (3.071)
Firm's interest deductibility curtailed	1.491 (1.826)	-4.554* (2.412)	3.959 (3.302)	-0.078 (2.707)	-6.303** (2.806)	-4.504 (5.841)
Tax loss carryforwards in percent of assets	-0.015 (0.026)	-0.048* (0.025)	0.031 (0.044)	0.020 (0.036)	-0.056** (0.024)	-0.037 (0.071)
Repatriation cost in percent of assets	-0.455*** (0.155)	0.064 (0.173)	-0.320 (0.218)	-0.453** (0.197)	0.303 (0.253)	-0.484 (0.465)
Repatriation cost missing	0.045 (0.950)	1.161 (1.279)	-0.725 (1.280)	-2.329** (1.185)	1.603 (1.349)	-0.994 (2.707)
Net DTL in percent of assets	0.095 (0.101)	-0.208 (0.147)	-0.219 (0.179)	-0.188 (0.164)	0.302* (0.161)	-0.368 (0.333)
Actuals:						
Change in GAAP ETR	-0.022 (0.045)	-0.113* (0.066)	-0.261*** (0.095)	-0.026 (0.069)	0.060 (0.073)	-0.260* (0.154)
Repatriation tax in percent of assets	0.296 (0.384)	-0.891* (0.516)	0.908 (0.613)	0.245 (0.587)	1.013 (0.658)	1.507 (1.220)
Remeasurement DTL and DTA in percent of assets	0.286 (0.223)	-0.476 (0.367)	-0.307 (0.463)	-0.144 (0.433)	0.179 (0.373)	-0.758 (0.795)
Observations	968	968	968	966	965	965
R-squared	0.271	0.140	0.194	0.143	0.161	0.172
Constant and controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes