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(Un)intended consequences? The impact of the 2017 tax cuts and jobs act on shareholder wealth

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ABSTRACT

We study the stock market reactions to the Tax Cuts and Jobs Act (TCJA), the most significant structural U.S. tax reform in over 30 years. In line with the stated intent of TCJA proponents, we find that the Act benefited highly taxed firms. However, the Act hindered firms with international operations as well as firms with high interest expense and tax losses. Counter to claims that the TCJA would quickly spur economic growth, we find that financially constrained and high growth opportunity firms did not benefit. Rather, market participants anticipate that most of the TCJA's benefits will be passed on to shareholders via higher corporate payouts. We confirm these market expectations by documenting that firms did increase payouts via repurchases after the TCJA, but did not increase their corporate investments.

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1. Introduction

On December 22, 2017, President Trump signed the Tax Cuts and Jobs Act (TCJA or the Act) into law — the only major structural change to U.S. corporate tax law since the Tax Reform Act of 1986 and the largest tax cut since the Economic Recovery Tax Act of 1981.[1] The TCJA's proponents argued that the Act would spur economic growth and corporate investment (e.g., Davidson, 2017). Conversely, its opponents argued that it was unnecessary, and that any proceeds coming from a reduction in taxes would be passed on to shareholders as increased corporate payouts (e.g., Stone, 2017). Despite concerns that the Act may not benefit a relatively strong economy (Appelbaum, 2017), it increased shareholders' overall wealth (see Fig. 1). However, which firms benefited from the Act is less clear. The TCJA's effect is not uniform as it contains provisions affecting only certain firms, and it is debatable whether the Act will support firms engaging in corporate investments or payouts.

This study has two goals. First, we investigate stock price reactions across different TCJA tax provisions during the legislative period of September to December 2017. To gauge the effects of the TCJA's various provisions on shareholder wealth, we analyze the 12 corporate tax provisions predicted to have the largest U.S. budgetary impact according to the non-partisan Joint Committee on Taxation (JCT) and Congressional Budget Office. Notably, the Act lowers the federal corporate tax rate from 35% to a flat 21% and allows the immediate expensing of capital expenditures. According to the JCT, these two tax-cutting provisions are expected to reduce corporate taxes by $1,434.8 billion by 2027. However, the TCJA increases corporate taxes by establishing new restrictions on the deductibility of interest expenses, tax operating losses, and R&D expenses. Further, it substantially changes international taxation by moving toward a territorial tax system that primarily taxes domestically produced income. Additionally, the TCJA imposes a one-time tax on all overseas unrepatriated earnings, which are not taxed under the prior system.

Second, we consider whether stock price reactions during the TCJA's legislative period are dependent on corporate investment opportunities and payout policies. Corporate finance theory predicts taxes affect equity valuation (Modigliani and Miller, 1958; Miller and Modigliani, 1961; Graham, 2003). Intuitively, all else being equal, paying lower taxes should benefit shareholders (e.g., Mills, 1996, 1998). An exogenous increase in cash flow can alle-

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[1] This excludes the permanent extension of the already implemented "Bush tax cuts" made during the Obama administration.
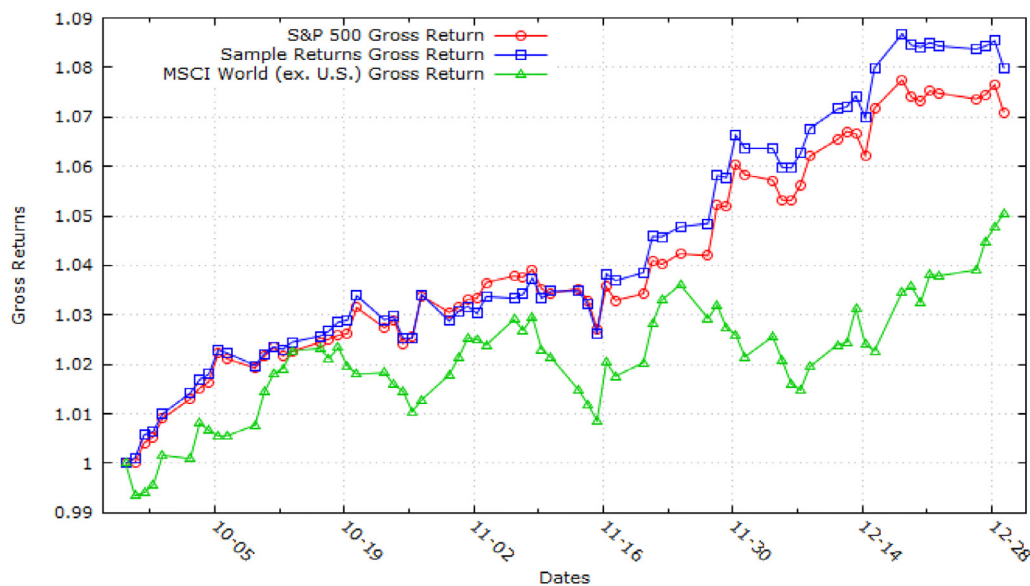
Fig. 1. Cumulative market return from September 26, 2017 to December 29, 2017.
This figure presents the cumulative value-weighted returns of our sample of firms (the blue line with squares), the S&P 500 index (the red line with circles) and the MCSI World index excluding the United States (green line with triangles) from the beginning of September 26, 2017 (i.e. the day before the release of the "Unified Framework" by the President and Congressional Republicans and our first key event date) to end of December 2017. The cumulative excess returns of the S&P 500 beyond the MSCI on key event days as defined in Table 2 are 2.247%. Given that the market capitalization of the S&P 500 index as of November 30, 2017 was $22.68 trillion, an increase of 2.247% translates to a gain of almost $600 billion in market value.

viate financing constraints and enable firms to invest in projects that they would otherwise forgo (e.g., Fazzari et al., 1988; Faulkender and Petersen, 2012). However, an exogenous positive shock to cash flows unaccompanied by a change in growth opportunities may not yield additional investment. Consequently, firms would simply distribute the cash to shareholders (Blouin and Krull, 2009; Dharmapala et al., 2011). If market participants expect that the intent of the Act would be achieved (i.e., spurring corporate investment), then the stock prices of financially constrained and high growth opportunity firms should respond positively. However, in a survey after the TCJA's passage, 42.9% of the responding analysts expect most of the tax savings to go towards share buybacks and dividends, whereas only 17.3% and 18.6% expect the savings to be allocated to capital spending or merger and acquisition activities, respectively (Morgan Stanley, 2018). Therefore, whether market reactions are different across firms based on their level of investment or payout is an empirical question.

This study documents that the TCJA's effects are not uniform across firms and that the Act has several intended and unintended consequences. Specifically, in line with the assertions of the TCJA's proponents (U.S. Department of the Treasury, 2017), the Act benefits highly-taxed domestically-focused firms while increasing taxes on firms using common forms of tax avoidance (i.e., offshoring income, fully eliminating income tax liabilities in profitable years using net operating losses, and overleveraging). However, counter to political proponents' claims that the TCJA will directly spur corporate investment, we find no evidence that firms with high growth opportunities and high financial constraint levels benefit from the Act. Rather, our results suggest the additional cash flows will be distributed to shareholders. These findings, robust to a battery of additional tests, indicate tax cuts may not directly drive corporate growth in the absence of new corporate investment opportunities.

As our paper studies specific provisions of the TCJA as well as post-TCJA changes in corporate behavior, it is different from

Wagner et al., 2018a, who examine general market expectations accompanying the election of President Trump and a Republican legislative agenda.[2] While the 2016 election of President Trump increased the odds of tax reform passing, the election did not ensure the future passage of a tax bill or its specific contents. Notably, a major tax reform was neither certain nor a priority for legislators during most of 2017 (Slemrod, 2018). Even during the brief three-month legislative period while the bill was debated, the contents of the final bill and the likelihood of its passage were considered highly uncertain. As such, surveys indicate that professionals were unsure regarding the likelihood, form, and timing of a comprehensive tax reform (e.g., National Foreign Trade Council, 2017), with prediction markets placing the probability of the TCJA's passage at roughly 30% at the start of the legislative process.[3] We present a more comprehensive discussion of the uncertain nature of the passage of the TJCA in Section 3.1.

To measure the effects of any regulation it is important that the regulation is unanticipated (Schwert, 1981; Binder, 1985). Thus, to assess the impact of the TCJA, it is important that we carefully isolate the dates on which significant unanticipated information is released to the public. Regulatory events, unlike corporate events such as earnings or merger announcements, have multiple dates on which market participants' expectations about passage probability change, such as progress through certain House and Senate committees (Schwert, 1981; Binder, 1985). To identify these event dates, we follow the news and search the Library of Congress website during the legislative period, from September 27, 2017 when a tax reform framework was officially announced to December 22, 2017 when the bill was signed into law. We also perform a thorough search of Wall Street Journal headlines during the legislative period to ensure that the major dates we

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[2] In Section 7.1 we formally discuss and show that the information incorporated during the TCJA's legislative process is distinctly different from the information incorporated during President Trump's election.

[3] See, for example, PredictIt at https://www.predictit.org/markets/detail/2726/Will-the-corporate-tax-rate-be-cut-by-the-end-of-2017.

select do not contain confounding events that could affect the results.

We employ time-series portfolio sorts and multivariate cross-sectional regressions to provide four sets of results. First, the portfolio sorts provide evidence of (i) a wealth increase for the shareholders of firms with high cash-effective tax rates, net deferred tax liabilities, and capital expenditures, and (ii) a wealth decrease for the shareholders of firms subject to the new limits on interest deductibility, firms with tax loss carryforwards, high R&D expenses, and a large percent of revenues from foreign operations. To study the new repatriation tax on unrepatriated foreign earnings, the largest tax increase in the TCJA, we hand collect data from 10-Ks. The results based on portfolio sorts show that firms with low levels of unrepatriated earnings experience positive market reactions. The results are robust to using both equal-weighted and value-weighted portfolio sorts.

Second, multivariate cross-sectional regression tests show that, across all 12 provisions, the flat tax of 21%, limits to interest deductibility, tax loss restrictions, and changes to international taxation have the greatest impact on shareholder wealth. Specifically, a one standard deviation increase in the cash effective tax rate before the Act results in 0.540% higher cumulative abnormal returns on key event days. However, a one standard deviation increase in the balance of tax loss carryforwards scaled by total assets reduces cumulative abnormal returns on key event days by 0.707%. Notably, firms subject to interest deduction limits experience a 2.143% reduction in cumulative abnormal returns on key event days. Additionally, when controlling for unrepatriated earnings and other characteristics, a one standard deviation increase in percent of revenues from foreign operations reduces cumulative abnormal returns on key event days by 0.919%. This reduction indicates that the supposedly beneficial shift to territorial taxation is viewed negatively by the market beyond the immediate and substantial burden of the deemed repatriated tax–possibly due to the unintentionally broad reach of the various new taxes on foreign income.

Third, we find positive stock market reactions for firms with high payout ratios. However, we do not find that stock market reactions vary significantly with the level of firms' financial constraints as measured by the Hadlock and Pierce (2010) index, the Whited and Wu (2006) index or the Kaplan and Zingales (1997) index. Stock market reactions also do not vary with the level of growth opportunities as proxied by the market-to-book ratio, three-year average earnings growth, and Tobin's Q. These results suggest that an influx of unexpected cash flows unaccompanied by positive shocks to growth opportunities is expected to be paid out to shareholders, all else equal.[4] Our results are in line with prior research finding that tax savings are passed on to shareholders. For example, Blouin and Krull (2009) show that firms spent 50% of their repatriation on payments to shareholders in response to the Homeland Investment Act of 2004, which provided a one-time tax holiday for the repatriation of foreign earnings. Dharmapala et al. (2011) find that this ratio is over 90%.

Finally, we also examine whether the actual behavior of firms confirms the above market expectations in the post-TCJA period. In line with stock market reactions, we show that firms increase their payouts in the first year after the Act by 3.7% (representing an 11% increase over the average payout ratio of 32.5%), primarily via re-

purchases as opposed to dividends. Further, firms did not increase investment activities, as defined by capital expenditures or R&D expenses. We acknowledge that building new factories and engaging in new innovation strategies are long-term business changes that take time for firms to implement and even longer for researchers to observe.[5] Therefore, our tests related to changes to corporate investment policies may not capture the full impact of the TCJA. In contrast, changes to corporate payout policies can take place in a relatively shorter period.

The contribution of our paper can be summarized as follows. First, we comprehensively study the stock market reactions to the TCJA by analyzing all major corporate tax provisions according to the JCT. We find evidence that the stock market reacted to the TCJA — a finding that is in contrast to the mixed effects on equity valuation documented by studies investigating the most recent prior tax reform passed in 1986. This is likely due to two major differences compared to the TCJA: the large tax increases in the 1986 tax reform,[6] as well as its long legislative window.[7] Second, we study the TCJA's stock price impact contingent on firms' financial constraints, growth opportunities, and payout policies. We find that market participants anticipate that most of the TCJA's benefits will be passed on to shareholders via higher corporate payouts. We also provide evidence on firms' actual payout and investment behaviors consistent with these stock market reactions. Third, to perform our analyses we carefully follow the days on which investor's expectations change and extensively discuss the political process. Fourth, we provide a high level of detail in the analysis of each tax provision to serve as a helpful reference for researchers in finance and economics, as well as legislators. Our paper contributes beyond Wagner et al., 2018b who study only stock price reactions to a limited number of TCJA provisions.

2. Effects of the TCJA's corporate provisions on equity holders' wealth

Here, we introduce the TCJA provisions we study, as well as our predictions regarding their effects on shareholder wealth (Table 1). While several of these provisions have been implemented on a small scale or temporary basis in prior tax reforms, many are untested in the United States. Specifically, limits to interest expense deductibility, restrictions on net operating losses, R&D amortization, and territorial taxation (and the related income shifting restrictions) have not been attempted in the U.S. and have therefore not been the subject of prior studies.

2.1. Effects of the tax cutting provisions

2.1.1. Flat corporate tax rate of 21%

Pre-TCJA tax rate schedules essentially create a flat 35% tax rate for any firm with more than a minimal amount of Internal Revenue Service (IRS) taxable income (unreported on financial state-

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[4] Prior literature has shown that a firm's announcement of a dividend increase or a stock repurchase has a positive effect on stock prices and that the effect is stronger for stock repurchases. See Ofer and Thakor (1987) and the papers cited there. Thus, documenting a positive stock price reaction for firms with high payout ratios during the TCJA's legislative period indicates that investors expect that firms will increase their payout.

[5] While we acknowledge that it may be too early to provide conclusive evidence of the effect of the TCJA on firms' investment decisions, the longer the period studied, the greater the possibility that confounding events might occur. For example, the recent coronavirus (COVID-19) pandemic is likely to negatively affect firms' investment. This and other shocks make long-term studies of the TCJA's impact on firm investment difficult.

[6] The argument that markets react positively to tax cuts not offset by tax increases is supported by the studies finding a positive market reaction to the "Bush tax cuts," i.e., the Economic Growth and Tax Relief Reconciliation Act of 2001 and the Jobs and Growth Tax Relief Reconciliation Act of 2003 (e.g., Auerbach and Hassett, 2007; Gadarowski, Meric, Welshn and Meric, 2007).

[7] Unlike prior tax reforms, the TCJA has a somewhat brief legislative period. The mixed market reactions to the 1986 reforms may be due to the extended negotiation period (e.g., Shevlin and Porter, 1992; Weiss, 1996), which means information was slowly priced into the market, leading to difficulties in capturing the impact of the passage of the reforms (e.g., Schwert, 1981).

Table 1
Key provisions of the 2017 Tax Cuts and Jobs Act.

(1)	(2)	(3)	(4)
Provision	U.S Budget Impact (in billions)	Variables	Expected sign on abnormal stock returns
Two tax-cutting provisions:			
Corporate tax rate of 21%	$−1348.50	Cash ETR; Net deferred tax liabilities (assets)	+
100% bonus depreciation for capital expenditures	$−86.30	Capex	+
Three tax-increasing provisions:			
Interest expense deduction is limited to interest income plus 30% of EBITDA (EBIT starting in 2022)	$253.40	Interest deductibility limited; book leverage	−
Limitations on deductions of net operating losses	$201.10	Tax loss carryforward	−
Amortization of R&D expenses and prevention of R&D related tax avoidance strategies	$119.70	R&D	−
Five changes to international taxation:			
Shift from modified worldwide taxation to modified territorial taxation	$−223.60	Percent of revenues from foreign operations (these first four provisions broadly affect multinationals and cannot be disentangled)	?
Global Intangible Low-Taxed Income (GILTI)	$112.40		
Foreign-Derived Intangible Income (FDII)	$−63.80		
Base Erosion Anti-abuse Tax (BEAT)	$149.60		
One-time transition tax on unrepatriated foreign earnings	$338.80	Unrepatriated earnings	−
Two tax simplifying provisions:			
Repeal of the corporate Alternative Minimum Tax (AMT)	$−40.30	Health insurance, mining, and oil industry indicators	?
Repeal of domestic production activities deduction (DPAD)	$98.00	Manufacturing industry indicator	?

Column 1 presents the key provisions of the Tax Cuts and Jobs Act. We group the provisions into tax-cutting, tax-increasing, tax-simplifying provisions, and changes to international taxation. Column 2 shows the predicted U.S. budgetary impact of each provision as estimated by the Joint Committee on Taxation (December 18, 2017 JCX-67–17) https://www.jct.gov/publications.html?func=startdown&id=5053. The twelve provisions studied comprise all but $104 billion in relevant business tax provisions, spread over 61 small provisions. For each provision, we select a variable that captures the extent to which a firm will be impacted by this provision (Column 3) and their expected impact on abnormal stock returns (Column 4).

ments).[8] Thus, the flat corporate tax rate of 21% marks a substantial reduction in cash taxes paid–14 percentage points or a 40% decrease in taxes paid on IRS taxable income, ceteris paribus. Even firms with effective tax rates (ETRs) well under 21% benefit from this 40% reduction as almost all firms paid the 35% statutory rate on IRS taxable income. The reason why firm ETRs are substantially lower than the statutory rate is that ETRs are calculated using financial statement income — which significantly exceeds IRS taxable income.[9] ETRs are also reduced by tax credits (and other items) which are dollar-for-dollar reductions in the firm's 35% (21% post-TJCA) tax paid on IRS taxable income.

The TCJA's rate decrease is the largest modern corporate tax cut. It also marks the first time in modern history when the U.S. has a formal flat corporate rate. While the last major corporate tax rate cut in the Tax Reform Act (TRA) of 1986 generally did not lead to positive market reactions, it is likely that this is due to the various tax increases in that law.[10] We expect that the TCJA should be most beneficial to firms that were paying high effective tax rates — these firms benefit more as larger expenses are being reduced. In addition, this new tax rate should also have a beneficial impact on firms with large accumulations of deferred tax liabilities. Prior research finds that de-

ferred tax liabilities (DTL) are viewed by investors as actual liabilities and investor valuations of DTLs are responsive to statutory changes in tax rates (Givoly and Hayn, 1992). Therefore, for firms that successfully shift income taxable at 35% into future periods, the TCJA's 21% rate should positively affect these firms. This effect should be the opposite for firms with accumulations of deferred tax assets, that is, the 21% flat tax rate change will have a negative effect on firms with accumulated deferred tax assets.

2.1.2. Immediate 100% expensing of capital assets

The TCJA establishes the immediate expensing (i.e. bonus depreciation) of 100% of the cost of both new and used capital asset purchases over a multi-year period. However, as pre-TCJA law allowed for the immediate expensing of 50% of newly purchased assets, the TCJA does not introduce immediate expensing, but simply less than doubles the prior allowable amount.[11] There are mixed conclusions in the literature regarding the effects of previous iterations of bonus depreciation. For instance, using an anonymized sample of firms made publicly available by the IRS, Zwick and Mahon (2017) find that immediate expensing spurs investment among small private firms. However, other researchers (e.g., Inger, 2014) show that immediate expensing does not affect firm value, potentially due to the short duration and low expensing percentages of the previous law. Overall, while this TCJA provision generally provides relief to firms with high capital expenditures, it is unclear whether the effect will be significant.

2.2. Effects of the tax increasing provisions

2.2.1. Limitations on the deductibility of interest expense

Historically, U.S. tax law favors corporate debt over equity as a financing source due to the deductibility of interest expense

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[8] Pre-TCJA schedules combine both progressivity and regressivity to reach an effective tax rate of 35% for all corporations with more than a minimal amount of IRS taxable income (https://www.irs.gov/pub/irs-prior/i1120–2017.pdf, page 18). Publicly available data obtained from the Statistics of Income division of the IRS support this claim. For example, in the most recently released IRS corporate tax data (2013), IRS taxable income (based on a representative sample of firms) was $1,258,482,675 and taxes paid (before credits) $441,849,495, which is equivalent to a 35.1% tax rate (https://www.irs.gov/pub/irs-soi/13coalccr.zip).

[9] Reported effective tax rates are significantly lower than 35%, ranging from the low 20's (Bozanic, Hoopes, Thornock, and Williams, 2017) to the high 20s (Dyreng, Hanlon, Maydew, and Thornock, 2017).

[10] TRA tax increases were intended to be equal to TRA tax cuts. Papers studying how the TRA affected stock prices include: McGrattan and Prescott (2005), Cutler (1988), Shevlin and Porter (1992), Weiss (1996), Downs and Hendershott (1987), Downs and Tehranian (1988), Bolster and Janjigian (1991), and Givoly and Hayn (1991).

[11] If a corporation purchases a computer system for $10,000, it could expense $5,000 immediately, and still considers regular depreciation of $1,000 (20% rate per the current tax depreciation system). This amounts to immediately expensing 60% under the previous system.

(e.g., Graham, 2000). The TCJA restricts the deductibility of interest to 30% of the adjusted taxable income (defined roughly as EBITDA during 2017–2021 and EBIT from 2022 onward). For firms with interest in excess of the threshold, interest deductions will be reduced, resulting in more taxes paid. Excluding the changes to international taxation, the interest deduction restriction is the largest tax increase in the TCJA. Based on both the size and design of the provision, it is a major pillar of the TCJA, which may significantly influence firm behavior and capital structure (KPMG, 2018).

While this provision does not completely eliminate the tax benefits of debt, it is intended to create a better parity between debt and equity financing and prevent the various tax avoidance strategies that involve overleveraging (De Mooij and Hebous, 2018; U.S. House Committee on Ways and Means, 2017, p. 37). This provision thus encourages high-leveraged firms to de-lever to new optimal levels. On one hand, if de-levering is inexpensive and can be accomplished with the excess cash flows received from the TCJA, we might not observe significant price reactions. On the other hand, if de-levering is expensive or infeasible in the short-term due to high debt levels, we would observe negative stock price reactions. Finally, it is also possible that government-encouraged de-leveraging will benefit firms with significant debt financing by reducing their risk. As a result, we may observe positive price reactions on high-leverage firms (De Mooij and Hebous, 2018). Although one can argue that the effect of this provision on stock prices is an empirical question, given this provision is a substantial tax increase, we expect its overall impact to be negative.

2.2.2. Restrictions on net operating losses

To receive tax benefits from a loss, firms must net the loss against income from another year. Pre-TCJA law allowed firms to carry net operating losses (NOLs) into prior years (receiving an immediate refund) and into future years. Prior law further allowed NOLs to eliminate 100% of the income in a given year, meaning that firms with large NOL carryforwards could potentially pay no tax while earning large profits. Due to these significant benefits, NOLs are generally considered the most prominent deferred tax asset (Miller and Skinner, 1998). Beyond the basic expectation that NOLs will be less useful, as they now protect a firm from a significantly lower tax rate, they can no longer be carried back and can only reduce taxable income in future years by 80%. Overall, we expect the TCJA to have a negative effect on firms relying on NOLs.[12]

2.2.3. R&D related provisions

The TCJA includes significant changes for firms engaging in R&D and those profiting from R&D related intangibles (e.g., patents). While pre-TCJA law allowed firms to immediately deduct R&D expenses, the TCJA modifies this law to mandate that firms amortize R&D over a five-year period (if conducted domestically) or a 15-year period (if conducted abroad). Furthermore, the TCJA institutes a new system of taxation for income sourced from both domestic and foreign intangibles. This system, further discussed in Section 2.3, prevents firms from locating innovation resources overseas to avoid U.S. taxes on income sourced from those resources. Overall, as R&D expense deductions and prominent international R&D tax avoidance strategies are restricted by the TCJA, we predict firms engaging in higher R&D activities to have their returns negatively affected by the TCJA.

2.3. Effects of the provisions related to international taxation

2.3.1. Shift to modified territorial taxation and related provisions

The most significant long-term structural reform in the TCJA is the shift from a system of modified worldwide taxation to one of modified territorial taxation.[13] While a system of worldwide taxation allows a nation to tax all income earned by its corporations (both foreign and domestic), a system of territorial taxation only taxes the income earned within the nation's borders. Therefore, this reform reduces the amount of foreign income subject to double taxation (i.e., income taxed in the U.S. and some other nation). We predict this shift to a modified territorial system to benefit firms with large foreign operations; however, related anti-abuse provisions may counteract it.

To prevent the abuse of territorial taxation, the TCJA established a Base Erosion and Anti-abuse Tax (BEAT), a tax on Global Intangible Low Taxed Income (GILTI), and a deduction for Foreign-Derived Intangible Income (FDII). Studies have shown that intangible innovation resources are a primary tax avoidance method and that a firm need not conduct genuine foreign activities to place innovation assets in foreign corporations to avoid U.S. taxes (e.g., Bennedsen and Zeume, 2017; Dyreng and Markle, 2016). In response to this and other issues, the TCJA institutes a two-part system of both tax increases to discourage firms from housing innovation/income in low-tax foreign jurisdictions (GILTI and BEAT) and tax reductions to encourage them to house innovation/income in the United States (FDII). As multinational firms will benefit from the move toward territorial taxation and the FDII incentive but will face additional taxes to prevent abuse of the new system (i.e., GILTI and BEAT), the net impact of the TCJA on multinational firms is an empirical question. We provide more details on these provisions in Appendix B.

2.3.2. One-time tax on unrepatriated earnings

As the prior system of international taxation encouraged the accumulation of foreign earnings, all profits previously unrepatriated are deemed to be repatriated under the TCJA at a rate of 15.5% for liquid assets and 8% for illiquid assets, regardless of whether overseas profits are brought to the US. Since prior to the TCJA firms were not taxed on unrepatriated earnings, we predict firms with large amounts of unrepatriated earnings to experience negative returns as a result of the TCJA.

While a deemed repatriation of all overseas profits has not been previously implemented, a "repatriation holiday" was implemented by the American Jobs Creation Act of 2004.[14] However, significant contrasts exist between this repatriation holiday and the deemed repatriation under TCJA. Most importantly, the deemed repatriation is mandatory, taxed at a higher rate, and expected to apply to trillions of dollars (Deloitte, 2018). Therefore, while the repatriation tax "holiday" was a positive event that firms actively accumulated overseas cash to utilize (De Simone, Piotroski, and Tomy, 2019), the deemed repatriation is not clearly beneficial to firms due to its mandatory nature and higher rate.

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[12] We acknowledge that, while this reform does not affect the pre-2018 NOLs, firms that regularly carry NOLs due to various business climate issues (e.g., airlines) will be negatively affected in the long term.

[13] We define the pre-TCJA U.S. system as "modified worldwide taxation," as firms were able to shield large quantities of foreign earnings from worldwide taxation using unrepatriated earnings and foreign tax credits. We use the phrase "modified territorial taxation" to describe the post-TCJA U.S. system, as TCJA provisions allow the U.S. to tax and incentivize foreign income to prevent abuse (discussed in this section and Appendix B).

[14] This repatriation holiday allowed firms to voluntarily repatriate foreign earnings at a 5.25% tax rate. As a result, roughly $362 billion were repatriated under this temporary program (Sullivan, 2011). Prior research has found that a repatriation holiday increases the value of certain firms (e.g., Waegenaere and Sansing, 2008), and that a number of firms used the influx of capital to engage in share buybacks (e.g., Blouin and Krull, 2009).

2.4. Effects of the tax simplifying provisions

While the TCJA eliminates various unnecessary deductions and credits given the new 21% rate, most were rather small or specialized. Here, we briefly summarize the TCJA's major tax simplifying provisions. First, the TCJA fully repeals the domestic production activity deduction. This domestic manufacturing deduction amounted to 9% of the domestic production activities (for further details, see the archived versions of IRC. Section 199). The calculation of this deduction was complex, with various restrictions that prevented it from being taken in full. Second, the TCJA also fully repeals the corporate Alternative Minimum Tax (AMT), a parallel tax system created to prevent corporations from avoiding all federal income taxation. While the repeal of the AMT is the smallest studied provision ($40.3 billion estimated impact), it is a distortionary tax with a likely understated budgetary impact.[15]

As manufacturing subsidies and the AMT affects several firms, formally studying the impact of these provisions is difficult. However, it is reasonable to presume that manufacturing industries and those with large amounts of deductions impacted by the AMT (mining/oil/health insurance) would be the most strongly affected by the repeal of these provisions. Unfortunately, confounding factors exist. These confounding factors and additional details on these provisions are discussed in Appendix B.

3. Legislative timeline

3.1. The uncertainty surrounding TCJA's legislative process

As tax reform has been a consistent policy focus for Republicans, their control of the executive and legislative branches of government led investors to price some level of the tax reform into the equity market (Wagner et al., 2018a). However, a tax reform was neither certain nor a legislative priority for most of 2017. This uncertainty can be attributed to the following factors. The Republican-led Congress primarily focused on healthcare, defense spending, and veterans' issues for the majority of 2017. As Republican majorities in both chambers of the Congress were small (e.g., Republicans held 52 of 100 Senate seats) and they were previously unable to deliver major legislation (e.g., the failed attempt at repealing the Obama-era healthcare law), the unified Republican control of the federal government did not ensure the passage of a tax reform. In addition, the short time frame allotted to the passage of the TCJA may have created the perception that the Republican tax reform effort was not serious (White, 2017). Finally, beyond the concrete legislative issues, the Trump administration faced several controversies both before and during the TCJA's legislative process, which arguably reduced the administration's ability to enact substantive legislation. We provide more details on the uncertain political environment in Internet Appendix IA.A.

3.2. TCJA legislative process and major dates

Over a three-month period at the end of 2017, the TCJA was introduced, debated, and officially signed into law. Table 2 presents the chronology of its passage and notes important dates, which we use to conduct our analyses. To identify these dates, we closely follow the news related to the passage of the TCJA over the legislative period and search the Library of Congress website as well as newspaper articles for major events that influence the probability of the passage of the tax reform. In addition, we search Wall Street Journal headlines during the legislative period to ensure that the major dates we select do not contain confounding events that could affect the results. Table 2 provides detailed explanations for each date, whether on that date the probability of passage increases or decreases, and whether the date is a major event date that significantly changes the probability of passage.

Our first major date, September 27, marks the release of a unified framework, in which the President, House, and Senate agreed on the basic principles of the tax reform. This broad agreement (coupled with a suggested timeframe for passage) was the first major sign that the tax reform package may pass in 2017. Our second major date, November 2, is the official legislative introduction of the TCJA. To pass a reform package within the targeted timeframe, a concrete bill with formal legislative language and provisions was required.[16] Our third major date, November 16, represents the passage of the TCJA in the House, after which the only major uncertainty remaining was the passage of a similar bill in the Senate. As the passage of the TCJA was far more contentious in the Senate than the House, the next set of major dates revolve around the more uncertain (and longer) Senate process.

On November 28, the Senate version of the TCJA was approved by the Senate Budget Committee—the final committee before the bill could be voted on by the full Senate. The bill began the process of expedited passage on November 30 with a motion to proceed to the final vote. Finally, after many last-minute changes to solidify Republican support, the Senate version of the TCJA passed at 1:36 am on Saturday, December 2 (market reaction on December 4). As these days in the Senate process involved uncertain bargaining with uncommitted Republican senators, each step can be viewed as containing significant new developments for the legislative process.[17] The final major date marks the reconciliation of the differences between the House and Senate versions of the TCJA. As the two versions were initially substantively different, uncertainty about the final contents existed until the reconciliation on December 15.

4. Data and variables

We obtain stock returns data from the Center for Research in Security Prices (CRSP) and accounting data from the CRSP/Compustat Merged database. We focus on firms incorporated in the US (i.e., those with CRSP share codes 10 or 11). We exclude firms for which return data in CRSP are not available over the estimation period—from September 1, 2016 to August 31, 2017—and the event window period—from September 27, 2017 to December 22, 2017. We also eliminate firms with closing prices below $5 on September 26, 2017, the day before the unified tax reform framework was announced by President Trump and Congress. We require firms to have available Compustat accounting data as of the most recent fiscal year-end before September 26, 2017. These initial filtering procedures yield a sample of 2073 firms. We then exclude financial firms (SIC codes 6000–6999) and utilities (SIC codes 4900–4999) from this sample, ending with 1441 firms. Omitting

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[15] That is, corporations work to ensure they are not directly impacted by large dollar amounts of AMT by engaging in aggressive tax and investment planning. See, for example, Lyon (1990). See also a recent Treasury Department report discussing the topic at https://www.treasury.gov/resource-center/tax-policy/Documents/Report-Responsible-Business-Tax-Reform-2017.pdf.

[16] This first release of the TCJA by the House satisfied these requirements and demonstrated the seriousness of congressional Republicans. Introduction in the Senate is not included as a major date since a formal framework had previously been released. Further, the day the Senate terminology was released created some doubt as to the likelihood of passing the TCJA due to several controversial Senate provisions.

[17] This is opposed to the many steps in the House process, which were largely expected formalities.

Table 2

Chronology of the passage of the Tax Cuts and Jobs Act.

Date	Legislative/political event	Effect on Probability of passage	Major event
27-Sep-17	The President, Senate, and House release a "Unified Framework" explaining the main goals of tax reform.	Increase	Yes
5-Oct-17	The House passes a budget that includes a reconciliation provision marked for tax reform. All tax cuts are to be offset by tax increases.	Increase	
20-Oct-17	Market reaction to the Senate passage of a budget including a reconciliation provision for tax reform (budget passed in the evening of Oct 19, 2017). The provision calls for a $1.5 trillion tax cut.	Increase	
26-Oct-17	The House passes the Senate version of the budget, officially adopting the Senate's $1.5 trillion tax cut. This event allows Congress to officially begin debate on tax reform bills that can be approved by a simple majority.	Increase	
2-Nov-17	The TCJA is formally introduced in the House.	Increase	Yes
8-Nov-17	Republicans lose gubernatorial elections in Virginia and New Jersey.	Decrease	
9-Nov-17	The Senate Finance Committee releases a draft version of the bill, which differs significantly from the House bill (e.g., the corporate rate cut is delayed one year until 2019). The House Committee on Ways and Means advances its version of the bill allowing a vote by the full chamber.	Decrease	
15-Nov-17	The Senate Finance Committee continues to differentiate their version of the bill by including various controversial provisions (e.g. individual tax cuts are temporary).	Decrease	
16-Nov-17	The House passes its version of the bill.	Increase	Yes
17-Nov-17	The Senate Finance Committee advances the bill.	Increase	
28-Nov-17	The Senate Budget Committee advances the bill, allowing a vote by the full chamber.	Increase	Yes
29-Nov-17	The Senate passes a motion to proceed to a final vote on the bill. Debate begins before markets close, but the motion passes after trading hours.	Increase	
30-Nov-17	Market reaction to the Senate passage of a motion to proceed to a final vote on the bill on the 29th. Senator John McCain formally expresses support for the bill.	Increase	Yes
1-Dec-17	Michael Flynn pleads guilty to lying to the FBI.	Decrease	
4-Dec-17	Market reacts to the Senate passage of the bill on Dec 2, 2017. The House votes to bring the bill to conference.	Increase	Yes
6-Dec-17	The Senate votes to bring the bill to conference, officially starting negotiations on the final bill.	Increase	
14-Dec-17	Senator Marco Rubio objects to certain aspects of the bill.	Decrease	
15-Dec-17	The conference committee appointed by the House and Senate concludes its work. The committee releases the revised bill on December 15 — which includes various accommodations for dissenting lawmakers.	Increase	Yes
19-Dec-17	The House passes the TCJA on Tuesday, Dec. 19, 2017.	Increase	
20-Dec-17	The Senate passes the TCJA on Wednesday, Dec. 20, 2017.	Increase	
22-Dec-17	President Trump officially signs the TCJA into law.	Increase	

This table documents the key legislative events. We search the Library of Congress website and newspaper articles for major events that influence the probability of the passage of tax reform. We include some events not directly related to tax reform because they influence the political prospects of Congressional Republicans and the Trump administration. For example, the events listed on November 8 and December 1 weakened the Republican Party and their ability to push major legislation, but represent non-tax political events. Our results are similar if we exclude these two dates from our analyses of negative event dates.

firms with negative pre-tax incomes or cash effective tax rates above 100%, our final sample consists of 1217 unique firms that are listed on the NYSE, Amex, and Nasdaq.[18] We then winsorize all continuous accounting variables at the 1% and 99% levels to reduce the effects of extreme outliers. Additional details on the sample construction and variable definitions can be found in Appendix A. Table 3 reports the summary statistics of the variables used in our empirical analyses.

Panel A of Table 3 shows that the cumulative raw return across the seven major event days identified in Table 2 is 6.44%, while the cumulative raw returns on event days with increasing and decreasing probability of passage are 8.13% and −2.25%, respectively. Thus, on average, market participants view the TCJA as a positive event for shareholder wealth.

4.1. Variables pertinent to the tax cutting provisions

To evaluate the effect of the flat tax rate of 21%, we look at the amount of taxes that a firm pays prior to the Act. *Cash ETR* is the average of income taxes paid divided by pretax income after adjusting for special items over the last three years, as effective tax rates vary significantly from year to year (Dyreng et al., 2008, 2017; Bozanic et al., 2017). The mean for this variable is 23.116% (Panel B, Table 3), which is consistent with summary statistics reported by prior studies (e.g., Bozanic et al., 2017).

The effect of the flat tax rate on stock returns will also depend on whether a firm has a large accumulation of deferred tax liabilities and deferred tax assets as the value of both will decrease under the lower statutory rate.[19] We capture this effect with *Net deferred tax liabilities (assets)* that we define as deferred tax liabilities less deferred tax assets and scaled by total assets, where a positive number indicates more deferred tax liabilities than deferred tax assets. The average for this variable is 0.707% (Panel B, Table 3), indicating that our sample firms, on average, have slightly higher deferred tax liabilities than deferred tax assets.

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[18] While we find similar results (untabulated) when including firms with negative pre-tax incomes or cash effective tax rates above 100%, we note that it is not clear how to interpret negative tax rates as firms do not necessarily receive a refund for annual tax losses and the tax refund is not necessarily associated with the loss in the negative denominator (Dyreng, Hanlon, and Maydew, 2008; Davis, Guenther, Krull, and Williams, 2016; Guenther, Matsunaga, and Williams, 2017; Dyreng et al., 2017).

[19] The average ratio of deferred tax liabilities to total assets in our sample is 6.202%, while the mean for deferred tax assets to total assets is 5.500% (unreported for brevity), which is consistent with those reported in prior studies such as Bozanic et al. (2017).

Table 3
Summary statistics.

Panel A: Stock returns	Obs.	Mean	Std. Dev.	P25	Median	P75
Cumulative raw return – key event dates (%)	1217	6.440	6.284	2.794	6.341	9.889
Cumulative raw return – event dates with increasing probability of passage (%)	1217	8.125	9.913	2.519	7.568	13.505
Cumulative raw return – event dates with decreasing probability of passage (%)	1217	−2.250	4.837	−4.770	−2.348	−0.004
Panel B: Variables related to the tax provisions	**Obs.**	**Mean**	**Std. Dev.**	**P25**	**Median**	**P75**
Tax-cutting provisions						
Cash ETR (%)	1217	23.116	14.398	13.640	23.463	31.243
Net deferred tax liabilities (assets) (%)	1217	0.707	6.626	−2.698	0.280	4.308
Capex (%)	1217	4.036	3.689	1.509	2.911	5.450
Tax-increasing provisions						
Interest deductibility limited	1217	0.164	0.371	0.000	0.000	0.000
Net interest expense exceeding 30% EBIT (%)	1217	0.191	0.614	0.000	0.000	0.000
Book leverage (%)	1217	26.839	21.250	9.524	25.326	39.804
Tax loss carryforward (%)	1217	10.735	26.062	0.000	1.960	8.487
R&D expense (%)	1217	2.472	4.314	0.000	0.100	2.952
International provisions						
Revenues from foreign operations (%)	1217	26.862	26.456	0.000	21.160	45.880
Unrepatriated earnings (%)	1217	10.545	17.121	0.000	1.118	14.182
Panel C: Other variables	**Obs.**	**Mean**	**Std. Dev.**	**P25**	**Median**	**P75**
Log (market cap)	1217	7.731	1.730	6.573	7.655	8.841
Market-to-book ratio	1167	4.419	6.268	1.675	2.721	4.530
Size-age index	1217	−3.945	0.530	−4.461	−3.975	−3.484
Payout ratio	1217	0.325	0.369	0.044	0.224	0.464

This table presents the summary statistics of the firms in our stock market event study. The sample excludes financial firms and utilities. The sample also excludes firms with stock price less than $5 on September 26, 2017, firms with negative pretax income, and firms with cash ETR higher than 100%. All variable definitions and sources are described in Appendix A. We multiply returns and accounting variables in percentages by 100 to express them in percentage points for ease of interpretation. All continuous accounting variables are winsorized at the 1% and 99% levels to lessen the impact of extreme outliers.

Another tax-cutting provision of the TCJA is the immediate 100% expensing of capital assets. Thus, our main variable of interest pertinent to this provision is capital expenditures scaled by assets, *Capex*. The average for this variable is consistent with prior studies such as Dyreng et al. (2017) and Canace et al. (2018).

4.2. Variables pertinent to tax increasing provisions

To identify firms affected by the deduction restrictions on interest, we construct three variables based on the newly established legal restrictions in Section 163(j). The first is an indicator variable equal to one if total interest expense is greater than the sum of total interest income and 30% of earnings before interest and taxes (*Interest deductibility limited*) and zero otherwise. The second measure is *Net interest expense exceeding 30% EBIT*, which is the amount of interest expense minus the sum of interest income and 30% of earnings before interest and taxes, scaled by total assets. Further, highly leveraged firms might be more affected by the deduction restrictions on interest. Therefore, we also construct a variable, *Book leverage*, defined as the sum of long-term debt and current debt divided by total assets. We acknowledge that this final variable does not directly capture the 30% limit. However, before the formal introduction of the interest restrictions on November 2, they were discussed without specific details, which may have caused investors to price in restrictions based on debt loads.[20]

The sample means for *Interest deductibility limited, Net interest expense exceeding 30% EBIT*, and *Book leverage* are 0.164, 0.191%, and 26.839%, respectively. These values indicate that 16.4% of the firms in our sample (200 firms) have a total interest expense

greater than the sum of total interest income and 30% of earnings before interest and taxes. We note that the average of 0.191% for *Net interest expense exceeding 30% EBIT* includes all the firms that do not exceed the 30% threshold. When we look at the 200 firms that exceed the 30% threshold, the mean for this variable is 1.165%.

To identify firms affected by new net operating loss limitations, we construct a variable, *Tax loss carryforwards*, which represents a firm's tax loss carryforward scaled by total assets. We also study the impact of the various restrictions to R&D tax avoidance by using the variable *R&D expense*.

4.3. Variables related to international provisions

To assess the effect of the international provisions of the TCJA, we focus on two firm characteristics: *Revenues from foreign operations* and *Unrepatriated earnings*. We calculate the percentage of revenues from foreign operations based on data provided by Compustat Segments and supplemented by data from Factset. Regarding unrepatriated earnings, we use the amount of permanently reinvested earnings under Accounting Standards Codification 740 to represent the amount of earnings subject to the TCJA's repatriation provision. We obtain this variable by hand-collecting firms' 10-Ks following the procedures described in Harford et al. (2017). See Appendix A for details of the hand-collection procedure. Panel B of Table 3 shows that 26.862% of total revenues are from foreign operations for the average firm in our sample, and the average ratio of unrepatriated earnings to total assets is 10.545%.

4.4. Other variables of interest

We measure the degree of financial constraint by using the *Size-age index* developed by Hadlock and Pierce (2010), where a higher value indicates greater financial constraints. We represent growth opportunities with the *Market-to-book ratio*. The level of payout is

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[20] That is, the language was initially general and stated: "The deduction for net interest expense incurred by C corporations will be partially limited." https://www.treasury.gov/press-center/press-releases/Documents/Tax-Framework.pdf. We note that pre-TCJA restrictions on interest expense were primarily based on large debt loads (See Section 163 of the pre-TCJA Internal Revenue Code).

represented with the *Payout ratio*. The summary statistics of these variables (Panel C, Table 3) are in line with those reported by prior studies (Dyreng et al., 2008, 2017; Bozanic et al., 2017; Wagner et al., 2018a). We proxy for firm size with *Log(market cap)*.

5. Empirical method and results

In this section, we test the impact of the changes in expectations about the TCJA on shareholder wealth. To do so, we study the abnormal stock returns on the major event days during the legislative period by conducting time-series equal-weighted and value-weighted portfolio sorts as well as multivariate cross-sectional regressions.

5.1. Time-series portfolio sorts

As news regarding the TCJA affects all firms simultaneously, abnormal returns across firms are likely to be correlated. This correlation can lead to understated standard errors and biased statistical inferences (Schwert, 1981; Campbell et al., 1997). One recommended approach to mitigate this issue is to first form portfolios based on the firm's characteristics and then test whether the portfolio returns on event dates differ significantly from those on non-event dates. Further, to quantify the differential impact, we look at the difference in abnormal returns between two portfolios: one composed of potential losers and the other of potential winners (Schwert, 1981; Campbell et al., 1997; Cai and Walkling, 2011).[21] For each of the continuous variables, we sort firms into four portfolios based on their quartile rankings within the sample. For each indicator variable we sort firms into two portfolios based on the values of the indicator variable. We are interested in the magnitude of the abnormal returns on the event dates. Our benchmark model is based on the Fama-French-Carhart (Fama and French, 1993; Carhart, 1997) four-factor regression model with an additional indicator variable to capture the event date:

$$R_{p,t} - R_{f,t} = \alpha + \beta_1 \left(R_{m,t} - R_{f,t} \right)$$
$$+ \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \beta_5 Event\_date \quad (1)$$

where $R_{p,t}$ is the equal-weighted or value-weighted return of the portfolio, $R_{m,t}$ is the market return, $R_{f,t}$ is the risk-free rate, *SMB* is the size factor, *HML* is the book-to-market factor, and *UMD* is the momentum factor. *Event_date* is an indicator variable equal to one if the trading day falls on an event date. The results (untabulated) are quantitatively similar if we use the CAPM model instead of the four-factor model.

Panels A, B, and C of Table 4 report the results for the equal-weighted portfolios based on three settings: the 7 major event days, the 16 days when the probability of the Act's passage increases, and the 5 days when the probability of the Act's passage decreases, respectively. The estimation period includes 230 non-event trading days as well as the corresponding event trading days between January 3, 2017 and December 29, 2017. For example, when we focus on the seven major event dates only, the estimation period includes 237 total trading days, and the coefficient β_5 provides an estimate of the average *daily* abnormal return across the seven event days and thus the seven-day abnormal return is β_5 multiplied by seven.

First, we focus our attention on Panel A of Table 4. Column (1) shows that the market reaction is negative and significant for low *Cash ETR* firms and positive and significant for high *Cash ETR*

firms. A zero-investment portfolio that buys firms in the top quartile and sells firms in the bottom earns a statistically significant a seven-day abnormal return of 0.396% * 7 = 2.772%. Column (2) reports results for when we sort firms on *Net deferred tax liabilities (assets),* which show that firms in the highest quartile have positive and significant abnormal returns. Moreover, a zero-investment portfolio that buys firms in the top quartile and sells firms in the bottom earns a risk-adjusted seven-day abnormal return of 1.309%. We find a similar pattern when we sort firms on *Capex*: a zero-investments portfolio that buys firms in the top quartile and sells firms in the bottom earns a risk-adjusted seven-day abnormal return 1.778%. Overall, the tax-cutting provisions of the TCJA seem to have generated a number of winners without necessarily producing losers outside of firms with low cash-effective tax rates.

The next five columns of Panel A of Table 4 show the results when we sort firms on variables associated with tax-increasing provisions. Specifically, Column (4) reports results when we sort firms into two portfolios based on whether a firm's ability to deduct interest expense is limited. The results show that firms not subject to the limit on interest deductibility experience a positive and statistically significant reaction, while those subject to the limit experience a negative and statistically significant reaction. A zero-investment portfolio that buys the firms that are subject to this limit and sells the firms that are not subject to the limit has a risk-adjusted seven-day abnormal return of −2.863%. In Column (5), we focus on only the 200 firms with net interest expense exceeding the 30% threshold and sort them into four quartile portfolios based on the amount exceeding the threshold, scaled by total assets. We find that only the firms with the lowest level of net interest expense above the threshold do not experience a negative and significant market reaction. Those firms slightly in excess of the newly established interest threshold are likely able to use the proceeds from the overall tax cut to de-lever and avoid the limit on interest deductibility. Firms in the top quartile of net interest expense above the threshold experience a seven-day abnormal return of −2.947%. We do not find evidence that highly leveraged firms are adversely affected by the restriction on interest deductibility (Column 6); rather, the market identifies and reacts to firms that would be subject to the TCJA's 30% threshold for interest deductibility. While we find that the firms in the lowest quartile of this variable have positive and significant results at the 10% level, the zero-investment portfolio does not earn a statistically significant abnormal return. Taken together, the results of Columns (4) through (6) show that limiting interest deductibility decreases shareholder wealth.

In Column (7) of Panel A in Table 4, we find that a zero-investment portfolio that buys the firms in the top quartile of *Tax loss carryforward* and sells firms in the bottom quartile has a negative and statistically significant risk-adjusted seven-day abnormal return of −2.786%. These findings indicate that firms that carryforward large amounts of tax losses experience an economically significant decrease in equity value compared to firms that carryforward little to no tax losses. We find similar results for *R&D expense* (Column 8). The zero-investment portfolio earns −2.268%, which is significant at the 1% level.

The last two columns of Panel A in Table 4 report results that are related to the international provisions of the TCJA. A zero-investment portfolio that buys firms in the top quartile of *Revenues from foreign operations* and sells firms in the bottom quartile has a negative and significant risk-adjusted seven-day abnormal return of −2.821%. This finding means that with regards to the shift to a modified territorial taxation system, domestic firms benefited from new incentives (e.g., FDII) while avoiding additional taxation, while internationally focused firms were relative losers. However, in the univariate setting we acknowledge that our re-

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[21] When using the phrases "winners" and "losers," we refer to the short-run stock price reactions, following prior studies (Schwert, 1981; Wagner et al., 2018a).

Table 4

Shareholder wealth effects on event dates: Quartile and zero-investment equal-weighted portfolios.

	Tax-cutting provisions			Tax-increasing provisions					International	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Cash ETR	Net deferred tax liabilities (assets)	Capex	Interest deductibility limited	Net interest expense exceeding 30% EBIT	Book leverage	Tax loss carryforward	R&D expense	Revenues from foreign operations	Unrepatriated earnings
Panel A: Event date is one of seven major event dates										
1 (lowest) [or indicator = 0]	−0.147**	−0.044	−0.047	0.140**	−0.131	0.126*	0.215***	0.193**	0.207**	0.156**
	(−2.32)	(−0.65)	(−0.79)	(2.57)	(−1.03)	(1.76)	(2.99)	(2.48)	(2.36)	(2.43)
2	0.015	−0.023	0.117**		−0.297**	0.049	0.145**	0.461*	0.251***	0.009
	(0.26)	(−0.37)	(2.03)		(−2.58)	(0.77)	(2.04)	(1.80)	(3.39)	(0.08)
3	0.175**	0.217***	0.016		−0.226*	0.062	0.098	0.032	0.034	0.114*
	(2.45)	(3.07)	(0.23)		(−1.76)	(0.97)	(1.52)	(0.42)	(0.57)	(1.67)
4 (highest) [or indicator =1]	0.249***	0.143**	0.207**	−0.269***	−0.421**	0.056	−0.183***	−0.131*	−0.197**	−0.104
	(3.09)	(2.12)	(2.34)	(−3.03)	(−2.12)	(0.78)	(−2.93)	(−1.70)	(−2.55)	(−1.57)
Difference (4-1)	0.396***	0.187**	0.254***	−0.409***	−0.290	−0.070	−0.398***	−0.324***	−0.403***	−0.261***
	(4.39)	(2.43)	(2.63)	(−4.36)	(−1.36)	(−0.80)	(−4.34)	(−2.80)	(−3.31)	(−3.08)
Panel B: Event date is one of sixteen probability-increasing dates										
1 (lowest) [or indicator = 0]	−0.112***	0.021	−0.025	0.117***	−0.098	0.129***	0.181***	0.191***	0.186***	0.115***
	(−2.63)	(0.47)	(−0.63)	(3.21)	(−1.14)	(2.69)	(3.71)	(3.68)	(3.16)	(2.66)
2	0.084**	−0.016	0.092**		−0.046	0.057	0.164***	0.415**	0.204***	0.170**
	(2.11)	(−0.39)	(2.38)		(−0.60)	(1.34)	(3.46)	(2.44)	(4.09)	(2.29)
3	0.143***	0.177***	0.062		−0.041	0.056	0.088**	0.038	0.027	0.131***
	(2.98)	(3.71)	(1.35)		(−0.48)	(1.31)	(2.06)	(0.75)	(0.70)	(2.86)
4 (highest) [or indicator =1]	0.194***	0.127***	0.180***	−0.127**	−0.323**	0.067	−0.129***	−0.115**	−0.107**	−0.065
	(3.60)	(2.77)	(3.03)	(−2.14)	(−2.45)	(1.41)	(−3.05)	(−2.23)	(−2.03)	(−1.45)
Difference (4-1)	0.306***	0.106**	0.205***	−0.245***	−0.225	−0.062	−0.309***	−0.306***	−0.293***	−0.181***
	(5.06)	(1.99)	(3.18)	(−3.85)	(−1.60)	(−1.05)	(−4.95)	(−3.95)	(−3.52)	(−3.09)
Panel C: Event date is one of five probability-decreasing dates										
1 (lowest) [or indicator = 0]	0.014	0.060	0.046	−0.065	0.159	0.051	−0.108	0.009	0.113	−0.013
	(0.19)	(0.77)	(0.67)	(−1.02)	(1.08)	(0.60)	(−1.30)	(0.10)	(1.10)	(−0.18)
2	−0.067	−0.059	−0.074		−0.054	−0.063	0.035	0.115	−0.225***	−0.041
	(−1.00)	(−0.81)	(−1.10)		(−0.40)	(−0.85)	(0.43)	(0.39)	(−2.66)	(−0.32)
3	−0.186**	−0.068	0.003		0.191	−0.175**	−0.033	−0.224**	−0.017	−0.079
	(−2.28)	(−0.85)	(0.04)		(1.29)	(−2.41)	(−0.44)	(−2.57)	(−0.25)	(−1.00)
4 (highest) [or indicator =1]	0.075	−0.099	−0.140	0.078	0.021	0.023	−0.028	0.039	−0.053	−0.053
	(0.80)	(−1.31)	(−1.36)	(0.77)	(0.09)	(0.29)	(−0.39)	(0.44)	(−0.58)	(−0.69)
Difference (4-1)	0.061	−0.159*	−0.185	0.143	−0.137	−0.028	0.079	0.031	−0.166	−0.040
	(0.59)	(−1.84)	(−1.64)	(1.31)	(−0.56)	(−0.28)	(0.76)	(0.23)	(−1.16)	(−0.42)

We sort sample firms into four portfolios based on their quartile rankings within each of the variables below. For indicator variables, we sort sample firms into two portfolios based on the values of the indicator variable. We then form zero-investment equal-weighted portfolios that buy the firms in the top quartile and sell the firms in the bottom quartile (or buy the firms with the indicator variable equal to one and sell the firms with the indicator variable equal to zero). During the estimation window from January 3, 2017 to December 29, 2017, we run the following regression for each portfolio: $R_{p,t} - R_{f,t} = \alpha + \beta_1 (R_{m,t} - R_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \beta_5 Event\_date_t$ where $Event\_date_t$ is defined differently in each of the three panels below. In Panel A, $Event\_date_t$ is an indicator variable equal to one if the return falls on one of the seven major event dates identified in Table 2. In Panel B, $Event\_date_t$ is an indicator variable equal to one if the return falls on one of the sixteen dates identified in Table 2 with increasing probability of the TCJA's passage. In Panel C, $Event\_date_t$ is an indicator variable equal to one if the return falls on one of the five dates identified in Table 2 with decreasing probability of the TCJA's passage. The estimation windows consist of 237 trading days (Panel A), 246 trading days (Panel B), and 235 trading days (Panel C) between January 3, 2017 and December 29, 2017. These windows include the 230 non-event trading days as well as the corresponding number of event trading days for each panel. This table reports the coefficients and t-statistics (in parentheses under the coefficients) of the variable $Event\_date_t$ obtained from all the portfolio regressions. The coefficient represents the average portfolio abnormal return on an event date. All variable definitions and sources are described in Appendix A. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

sult might be biased by the fact that most firms with large foreign operations also have large quantities of newly taxed unrepatriated earnings.

The last column shows the results when we sort on *Unrepatriated earnings*. We find that a zero-investment portfolio that buys firms in the top quartile and sells firms in the bottom quartile of this variable earns a significant and negative seven-day abnormal return of −1.827%. These results are stronger for value-weighted returns (Panel A Table IA.2 of the Internet Appendix), which indicates that our findings are driven by larger firms.[22] We further

find that our results are driven by events near the end of the legislative process, in line with the fact that during this later period the tax rate on repatriation rose considerably. These results are presented and discussed in the Internet Appendix IA.B and Table IA.1.

Overall, the results reported in Panel A of Table 4 are largely consistent with the predictions in Table 1. As already noted, to capture the effect of regulations such as the TCJA, a researcher must identify the timing of changes in expectations about the regulation (Schwert, 1981; Binder, 1985). To buttress the results for the key event dates in Panel A, we also report the results for all days on which the probability of the TCJA's passage increases. Panel B of Table 4 presents the results when we re-run the regression model in Eq. (1) but *Event_date* now equals one if the trading day falls

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[22] In Panel A of Table IA.2 in the Internet Appendix (value-weighted portfolios), the results in Column 10 are highly significant for both the first and fourth quartiles as well as the long-short portfolio.

on one of the 16 probability-increasing event days. The results in Panel B generally support the results in Panel A.

In Panel C of Table 4 we provide results for the five days on which the probability of the Act's passage decreases. We find no statistically significant abnormal return for any of the zero-investment portfolios, except for the negative return on *Net deferred tax liabilities (assets)*. These results suggest that the market does not perceive these events to significantly impact the passage of the TCJA.

Finally, we note that the results so far are based on equally weighting the returns of stocks in each portfolio. Our results are robust if we use value-weighted portfolio returns that are presented in Table IA.2 of the Internet Appendix.

5.2. Multivariate cross-sectional firm-level regressions

Time-series univariate portfolio sorts ignore the fact that more than one provision can affect firms and that the effects can be interrelated. To evaluate these interrelations, we use a cross-sectional multivariate regression to investigate how abnormal stock returns vary with firm characteristics.

In this analysis, we use the traditional method of an event study to obtain abnormal stock returns; we use the Fama-French-Carhart four-factor model and run an ordinary least squares (OLS) test of the daily stock returns on the daily factor returns in order to obtain the beta loadings for each stock. The results (untabulated) are the same if we use the CAPM model. The estimation window is from September 1, 2016, to August 31, 2017, which equals 252 trading days. We then obtain the abnormal returns for each stock on an event day and sum the abnormal returns to obtain a cumulative abnormal return (CAR). The average four-factor CARs for the 7 major event days, the 16 event days with increasing probability of passage, and for the 5 event days with decreasing probability of passage are 0.569%, 1.447%, and −0.204%, respectively (untabulated). The average CAR on key event days across the firms in our sample is 0.569%. The average firm size in our sample is $12.5 billion while the median is $2.1 billion. These numbers translate to an increase in shareholder value of between 0.569%*12.5 billion = $71.125 million and 0.569%*2.1 billion = $11.949 million. This evidence shows once again that on average shareholders see their wealth increase. We use these CAR estimates as the dependent variables in our multivariate cross-sectional regressions. We note that each firm only has one observation in each regression. All variable definitions are provided in Appendix A. All continuous independent variables are also standardized, and the dependent variable is multiplied by 100 for ease of interpretation. We exclude the variable *Net interest expense exceeding 30% EBIT* as it is highly correlated with the *Interest deductibility limited* variable.

5.2.1. Firm characteristics related to the tax provisions

Table 5 presents the results of the cross-sectional regressions. Similar to Table 4, we provide results over the 7 key days (Column 1), the 16 probability increasing days (Column 2), and the 5 probability decreasing days (Column 3), respectively. We use CARs on the dates of interest as the dependent variable in all regression specifications. In all regression specifications, we include industry fixed effects, and we cluster the standard errors at the industry level (industries are defined by their 2-digit SIC codes). In Columns (1) and (2), the coefficients for *Cash ETR* are positive and significant while the coefficients for *Interest deductibility limited, Tax loss carryforward*, and *Revenues from foreign operations* are negative and significant. These results are economically significant. A one standard deviation increase in *Cash ETR* is associated with 0.540% higher CARs on key event days. However, firms subject to the limits on interest deductibility experience 2.143%

lower CARs. Further, a one standard deviation increase in *Tax loss carryforward* and *Revenues from foreign operations* are associated with 0.707% and 0.919% lower CARs, respectively. Taken together, these results indicate that the TCJA provisions with the greatest impact on shareholder wealth are the flat tax rate of 21%, the limitations on interest deductibility and net operating losses, and the shift from modified worldwide taxation to modified territorial taxation.

Column (2) provides evidence that the repatriation tax has a negative impact on shareholder wealth. While the coefficient for *Unrepatriated earnings* is not significant in Column (1), this is likely due to the lower rates applied to the repatriation earlier in the legislative process that lessened its market impact during early key dates (Appendix B). Columns (1) and (2) of Table 5 demonstrate two major points regarding the various changes to international taxation. First, we provide evidence that our univariate results related to unrepatriated earnings reported in Table 4 are not driven by the fact that firms with large quantities of unrepatriated earnings are also likely to have high levels of foreign income – as we now have both *Unrepatriated earnings* and *Revenues from foreign operations* in one regression specification. Second and similarly, by using both in one specification, we also demonstrate that the market's strongly negative response to the permanent shift to a system of modified territorial taxation is not driven by the one-time tax on unrepatriated earnings – the largest tax increase in the TCJA. While the officially scored net budget impact of the shift to territorial taxation is a tax decrease,[23] the negative reaction to the shift may indicate that investors recognize the potential for the broad enforcement of ostensibly narrowly focused additional taxes (e.g., the GILTI), which is in line with various anecdotes (e.g., Rubin, 2018).

Column (2) also provides evidence that firms, on average, lose from the new provision that limits the deductibility of R&D expenses. The fact that this provision is not in the initial framework of the law (Appendix B) is a likely reason for why the coefficient for *R&D expense* is negative and significant in Column (2) only, but not in Column (1). The information related to R&D restrictions was not released until November 9, thereby avoiding multiple key event dates. Table IA.1 in the Internet Appendix shows that on the key events days, the negative reaction occurs mainly on December 4. Given this evidence, we can also conclude that the provision that limits the deductions for R&D expense is important and negatively affects shareholder wealth.[24]

Column (3) shows the results for days on which the probability of the passage of the Act decreases. Notably, the coefficients for all variables pertinent to the major provisions are insignificant but one. The coefficient for *Interest deductibility limited* is positive and significant in Column (3), indicating that stock market participants view the limiting of interest deductibility as a negative event for shareholder wealth.

In sum, the cross-sectional multivariate results reported in Table 5 show that across all provisions the following have the greatest impact on shareholder wealth: the flat tax rate of 21% has a significantly positive effect, while the newly established limits on interest and operating losses as well as the shift to territorial taxation have significantly negative effects.

5.2.2. Growth opportunities, financial constraints, and payout policy

As one of the stated goals of the TCJA is to spur economic growth (Davidson, 2017), we examine the market reactions to the

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[23] That is, the net effect of the shift to territorial taxation (−223.6), GILTI (112.4), FDII (−63.8), and BEAT (149.6) is a tax cut of $25.4 billion.

[24] This finding may also be due to the fact that the elimination of immediate R&D expensing is the only major TCJA provision that begins after 2018, and it may be repealed prior to its scheduled enactment.

Table 5
Multivariate cross-sectional regressions.

	(1)	(2)	(3)
	Major event dates	Probability-increasing dates	Probability-decreasing dates
Cash ETR	0.540***	0.765***	0.075
	(2.99)	(2.69)	(0.61)
Net deferred tax liabilities (assets)	0.119	−0.051	−0.070
	(0.56)	(−0.17)	(−0.41)
Capex	0.399	0.447	−0.406
	(1.35)	(0.98)	(−1.60)
Interest deductibility limited	−2.143***	−2.149**	0.846**
	(−3.82)	(−2.61)	(2.03)
Book leverage	0.357*	0.366	−0.055
	(1.72)	(1.18)	(−0.27)
Tax loss carryforward	−0.707**	−1.214***	−0.081
	(−2.22)	(−2.72)	(−0.50)
R&D expense	−0.150	−0.840***	0.406
	(−0.77)	(−3.36)	(1.58)
Revenues from foreign operations	−0.919***	−1.037**	0.016
	(−3.40)	(−2.26)	(0.10)
Unrepatriated earnings	0.034	−0.573*	0.008
	(0.14)	(−1.88)	(0.05)
Log (market cap)	−0.126	0.263	0.125
	(−0.63)	(0.78)	(0.69)
Industry fixed effect	Yes	Yes	Yes
N	1217	1217	1217
Adjusted R^2	0.197	0.305	0.053

This sample consists of 1217 firms with non-missing values for all variables used in the regression. For each firm we estimate the abnormal return using the Fama-French-Carhart four-factor model. First, we run an OLS regression of daily stock returns on daily factor returns $R_{i,t} - R_{f,t} = \alpha + \beta_1(R_{m,t} - R_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t$ during an estimation window, which spans 252 trading days from September 1, 2016 to August 31, 2017. We then obtain abnormal returns for each stock on dates of interest as identified in Table 2 – seven major dates, sixteen dates with increasing probability of passage, and five dates with decreasing probability of passage Finally, we sum the abnormal returns to obtain a cumulative abnormal return (CAR) on the dates of interest, which is used as the dependent variable in the regressions. All other variable definitions are provided in Appendix A. All continuous accounting variables are winsorized at the 1% and 99% levels. All independent variables are standardized for ease of interpretation, except for the indicator variable *Interest deductibility limited*. Standard errors are clustered at the industry level. Industries are defined by their 2-digit SIC codes. *T*-statistics are reported in parentheses under the coefficients. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

TCJA based on firms' levels of financial constraints and growth opportunities.[25] Conversely, some anecdotes have suggested that the TCJA will not jumpstart corporate investment in jobs and capital projects, but rather increase corporate payouts to investors (Stone, 2017).

To study the above possibilities, we add the *Market-to-book ratio, Size-age index*, and *Payout ratio* variables one at a time into the regression specifications reported in Table 5. The results are reported in Table 6. Adding these three variables to the regression specifications reported in Table 5 does not quantitatively change the results reported for the tax provision variables studied in that table. For brevity, in Table 6 we do not tabulate the coefficients for all variables, but these results are available upon request (we report the full set of coefficients for Panel C of Table 6 in the Internet Appendix Table IA.3).

Focusing on the variables of interest in Panels A and B of Table 6, we find that the coefficients for *Market-to-book ratio* and *Size-age index* are insignificant in all columns. These results indicate that constrained firms and firms with high growth opportunities did not gain or lose from the TCJA, indicating that an exogenous increase to cash flow may not result in additional corporate investment in the absence of new growth opportunities. However, the coefficient for *Payout ratio* is positive and significant (Panel C, Columns 1 and 2). This finding shows that market participants perceive that firms with high payout ratios gain

from the TCJA. We posit that investors believe that these firms will use the additional cash flows provided by the TCJA to further increase payouts, which supports various anecdotes (Morgan Stanley, 2018) and studies (Blouin and Krull, 2009; Dharmapala et al., 2011).

It is worth noting that high payout firms are generally large, have fewer growth opportunities, and are profitable with presumably fewer financial constraints (Fama and French, 2001). In light of this evidence, there is a possibility that our results reported in Panel C of Table 6 — that firms with high payout gained — may simply indicate that firms that are large, with lower growth prospects and fewer financial constraints gained (captured via *Payout ratio*). To alleviate this concern, we control for the above-discussed firm characteristics and estimate a regression with all three variables included: *Market-to-book ratio, Size-age index*, and *Payout ratio*. We present these results in Panel D of Table 6. We note that we continue to observe a positive and significant coefficient on *Payout ratio*, which demonstrates that high payout firms gained during the TCJA legislative period even after controlling for constraints and growth. Thus, investors anticipate that all else equal, high payout firms will continue to pay, or even increase their payout, after the passage of the TCJA. Further exploring this result, in untabulated tests, we find that firms in the highest quartile of payout benefit the most from the TCJA's passage.

The results reported in Table 6 are essentially the same in a parsimonious regression setting, i.e. keeping only *Market-to-book ratio, Size-age index*, and *Payout ratio* as right-hand-side variables and using industry fixed effects. These results are unreported for brevity and are available upon request. To further test the robustness of the findings reported in Table 6, we replace the *Market-*

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[25] Prior research argues that a lower tax rate on capital income spurs economic growth (Judd, 1985; Chamley, 1986). However, this argument is not without controversy (e.g., Banks and Diamond, 2010). Recently, Jaimovich and Rebelo (2017) argued that the relationship between taxes and growth may be nonlinear: low tax rates have a small impact on long-run growth rates, but as tax rates increase, their negative impact on growth increases.

Table 6
Growth opportunities, financial constraints, and payout policy.

	(1)	(2)	(3)
	Major event dates	Probability-increasing dates	Probability-decreasing dates
Panel A. Growth opportunities			
Market-to-book ratio	0.246	0.433	0.234
	(1.38)	(1.42)	(1.00)
All variables from Table 5	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
N	1167	1167	1167
Adjusted R^2	0.192	0.302	0.047
Panel B. Financial constraints			
Size-age index	−0.218	0.048	0.259
	(−0.95)	(0.15)	(1.56)
All variables from Table 5	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
N	1217	1217	1217
Adjusted R^2	0.197	0.305	0.053
Panel C. Payout policy			
Payout ratio	0.593**	0.580*	0.088
	(2.38)	(1.71)	(0.53)
All variables from Table 5	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
N	1217	1217	1217
Adjusted R^2	0.204	0.308	0.052
Panel D. All three variables			
Payout ratio	0.628**	0.673**	0.018
	(2.45)	(2.01)	(0.11)
Market-to-book ratio	0.205	0.361	0.216
	(1.15)	(1.19)	(0.94)
Size-age index	−0.212	0.108	0.202
	(−0.94)	(0.37)	(1.22)
All variables from Table 5	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes
N	1167	1167	1167
Adjusted R^2	0.199	0.304	0.046

This table re-runs the regression specifications reported in Table 5 but includes proxies for growth opportunities (market-to-book ratio), financial constraints (size-age index), and payout policy (payout ratio). *Market-to-book ratio* is computed as the market value of equity divided by the book value of equity. *Size-age index* is computed as in Hadlock and Pierce (2010). *Payout ratio* is computed as the ratio of total distributions (preferred stock dividends, common stock dividends, share repurchases) divided by operating income before depreciation. For each firm we estimate the abnormal return using the Fama-French-Carhart four-factor model. First, we run an OLS regression of daily stock returns on daily factor returns $R_{i,t} - R_{f,t} = \alpha + \beta_1(R_{m,t} - R_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t$ during an estimation window, which spans 252 trading days from September 1, 2016 to August 31, 2017. We then obtain abnormal returns for each stock on the seven major event dates, sixteen probability-increasing dates, and five probability-decreasing dates identified in Table 2. Finally, we sum the abnormal returns to obtain a cumulative abnormal return (CAR) of the event dates, which is used as the dependent variable in the regressions. All other variable definitions are provided in Appendix A. All continuous variables are winsorized at the 1% and 99% levels. All independent variables are standardized for ease of interpretation, except for indicator variable *Interest deductibility limited*. Standard errors are clustered at the industry level. Industries are defined by their 2-digit SIC codes. *T*-statistics are reported in parentheses under the coefficients. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

to-book ratio with two alternative proxies for growth opportunities: three-year average earnings growth and Tobin's Q. We obtain similar results. Additionally, we obtain similar results when replacing the *Size-age index* with two alternative measures of financial constraints: the Whited and Wu (2006) index or the Kaplan and Zingales (1997) index. These results are unreported for brevity and available upon request.

In order to further explore whether these results are driven by payout activities as opposed to other firm characteristics correlated with these activities, we explore actual post-TCJA firm payout policies in Section 6.

5.3. Effects of the TCJA on specific industries

Finally, our study considers the possibility that three industries would be impacted by the tax simplifying TCJA provisions as outlined in Table 1. We propose that manufacturing firms are relative losers due to the repeal of domestic manufacturing subsidies – potentially confounded by the wide variety of manufacturing indus-

tries impacted. Next, we argue that health insurance and mining and oil firms are relative winners due to the repeal of the AMT – though the repeal of the health insurance mandate and oil price fluctuations may have served as confounding events. Throughout our analyses, we do not find support for these expectations. We do not tabulate these findings for brevity.

6. Early evidence on firm behavior after the TCJA

The results so far show that, in response to the passage of the TCJA, firms with high payout ratios experience higher returns while firms with high growth opportunities and financial constrains do not. These findings support the conjecture that shareholders expect that the additional cash flows will be passed on to them rather than be used to directly fuel additional corporate investments. We now examine whether these expectations materialize in the relatively short post-TCJA period that we observe.

Table 7
Payout behavior after the TCJA.

|	(1)	(2)	(3)	(4)	(5)	(6)
	Payout ratio	Dividend ratio	Repurchase ratio	Payout ratio	Dividend ratio	Repurchase ratio
Post TCJA	0.098***	0.005	0.116***	0.059*	−0.006	0.077**
	(3.67)	(0.24)	(4.24)	(1.91)	(−0.28)	(2.44)
Firm age $_{t-1}$	0.009	0.075***	−0.050***	0.276**	0.554***	−0.043
	(0.78)	(6.39)	(−4.50)	(2.33)	(5.03)	(−0.37)
Log(Total assets) $_{t-1}$	0.106***	−0.024	0.155***	0.108	−0.453***	0.441***
	(6.74)	(−1.45)	(10.60)	(0.84)	(−4.12)	(4.66)
Losses $_{t-1}$	−0.017	−0.041***	0.013	0.002	−0.044**	0.028
	(−1.27)	(−3.56)	(1.02)	(0.12)	(−2.31)	(1.46)
R&D expense $_{t-1}$	0.012	−0.068***	0.068***	−0.062	−0.081**	−0.004
	(0.68)	(−4.12)	(3.56)	(−0.99)	(−2.13)	(−0.06)
Capex $_{t-1}$	−0.050***	−0.023*	−0.033***	−0.019	−0.019	−0.013
	(−3.91)	(−1.96)	(−2.80)	(−1.12)	(−0.88)	(−0.72)
Market leverage $_{t-1}$	−0.153***	−0.074***	−0.128***	−0.389***	−0.143***	−0.366***
	(−10.92)	(−5.88)	(−8.97)	(−12.68)	(−5.09)	(−11.55)
Cash flow / Lagged total assets $_t$	−0.122***	−0.090***	−0.076***	−0.353***	−0.287***	−0.233***
	(−6.04)	(−5.11)	(−4.13)	(−11.65)	(−9.58)	(−8.44)
Cash/ Total assets $_{t-1}$	0.126***	0.088***	0.068***	0.219***	0.130***	0.166***
	(6.01)	(4.51)	(3.54)	(6.42)	(4.78)	(4.64)
Tobin's Q $_t$	0.114***	0.071***	0.074***	0.072**	0.097***	0.038
	(5.42)	(3.96)	(3.67)	(2.37)	(4.18)	(1.15)
Volatility $_{t-1}$	−0.081***	−0.058***	−0.050***	−0.061***	−0.040***	−0.056***
	(−6.63)	(−5.20)	(−4.20)	(−4.28)	(−2.95)	(−4.04)
Cash flow volatility $_{t-1}$	0.000	−0.002	0.005	−0.040	−0.071***	−0.015
	(0.02)	(−0.18)	(0.32)	(−1.21)	(−2.71)	(−0.44)
Payout ratio $_{t-1}$	0.384***					
	(19.76)					
Dividend ratio $_{t-1}$		0.622***				
		(20.71)				
Repurchase ratio $_{t-1}$			0.409***			
			(22.53)			
Fixed Effects	Industry	Industry	Industry	Firm	Firm	Firm
Clustered Standard Errors	Firm	Firm	Firm	Firm	Firm	Firm
N	8358	8358	8131	8325	8325	8171
Adjusted R^2	0.324	0.487	0.323	0.459	0.645	0.442

This sample consists of the 1217 unique firms in our sample and their fiscal year data from January 2011 to June 2019. *Post TCJA* is an indicator variable equal to one if a firm's fiscal year end falls on or after June 30th, 2018. All other variable definitions are provided in Appendix A. All continuous variables are winsorized at the 1% and 99% levels. All variables are standardized for ease of interpretation. Independent variables are lagged except contemporaneous *Cash flow/Lagged total assets* and *Tobin's Q*. Industries are defined by their 2-digit SIC codes. *T*-statistics are reported in parentheses under the coefficients. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Fig. 2 displays the payout and investment behaviors for firms in our sample over the 2011–2019 period. It provides initial evidence that firms increase their payout after the TCJA while investment activities have remained relatively constant. To provide systematic evidence on whether firms actually increase their corporate payouts in the year after TCJA, we perform multivariate analyses where the dependent variable is *Payout ratio, Dividend ratio,* or *Repurchase ratio*. We also test whether firms engage in additional investment activities in the year after the TCJA, although we acknowledge that the modification of actual firm investment practices requires significant lead time and may not be evident shortly after the passage of a tax cut or other form of exogenous economic stimulus. The dependent variables that proxy for investment activities are *Capex* and *R&D expenses* in line with Bliss et al. (2015). The independent variable of interest in the multivariate regression is an indicator variable that equals one if a firm's fiscal year-end falls on or after June 30, 2018, *Post TCJA*. Tables 7 and 8 report the results of this multivariate regression for corporate payout and corporate investment, respectively. The sample period is from January 2011 to June 2019 and is comprised of our 1,217 unique firms. We include a battery of control variables known to explain corporate payouts and investment behavior (Bliss et al., 2015). The results are robust if we perform the analyses over a shorter sample period spanning 2015 to 2019. These results are available upon request.

First, we focus on the results related to corporate payout. Column (1) of Table 7 shows that, on average, firms increase their corporate payouts in the year after the TCJA in line with the market expectations documented in Table 6. The next two columns show results when the payout is broken into *Dividend ratio* and *Repurchase ratio*. The coefficient for *Dividend ratio* is nonsignificant, while the coefficient for *Repurchase ratio* is positive and significant. Columns (4) through (6) show that the results are robust to the inclusion of firm fixed effects, as well as standard errors clustered at the firm and year level. In terms of economic magnitude, Columns (1) and (3) show that after the TCJA, payout ratios increase by 3.7% (0.098 of one standard deviation of payout for the sample used in this regression, 0.381), and the increase in repurchase ratios is also 3.7% (0.116 of one standard deviation of repurchase, 0.319)

To buttress the above results, we also provide a placebo test in Table IA.4 in the Internet Appendix. In this placebo test, we define the post-TCJA period as starting from the December 31, 2017, fiscal year-end. While some firms may have already anticipated the changes to tax laws and adjusted their payout policy accordingly for that year, it is unlikely that most firms were able to immediately and substantially adjust their corporate payout policies within the short timeline between the official passage of the Act on December 22, 2017 and the close of the December 31, 2017 fiscal year. The results of our placebo test confirm that there is no

Panel A: Total payout, dividend payout, and repurchase payout ratios
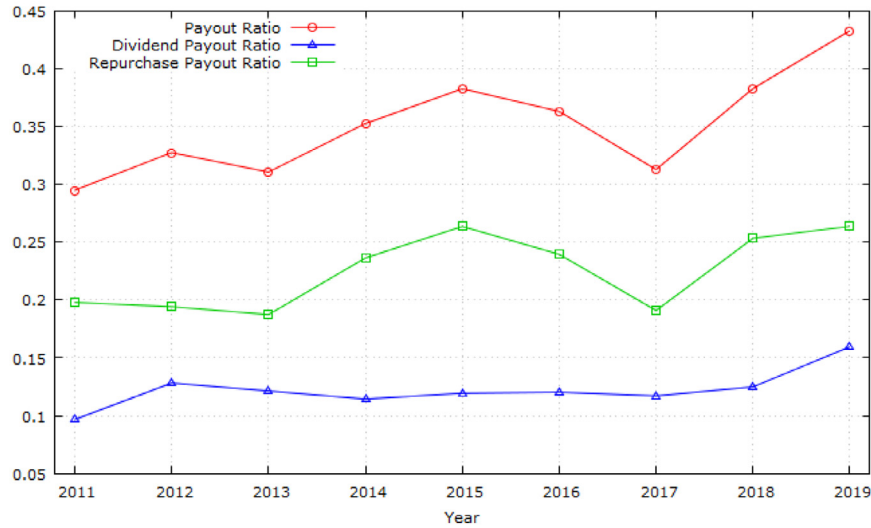
Panel B: Capital and R&D expenditures
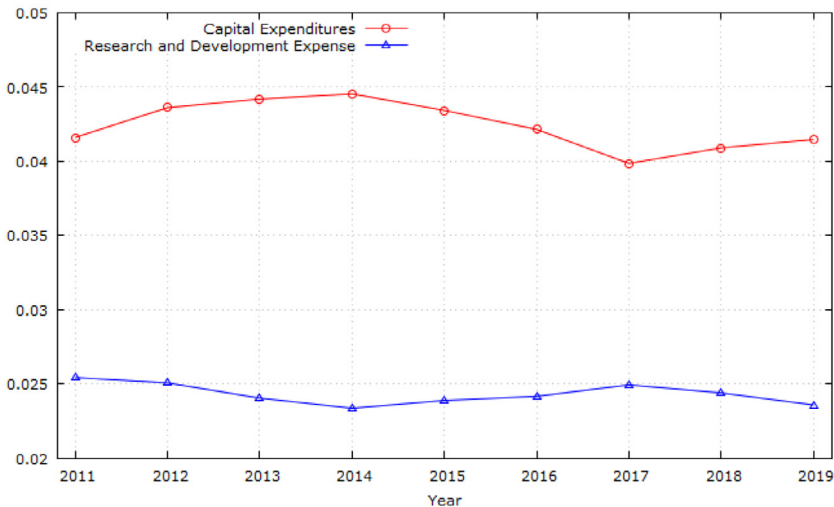
Fig. 2. Payout and investment behavior for sample firms before and after the TCJA.
Panel A presents the total payout, dividend payout, and repurchase payout ratios for firms in our sample over the same period. Panel B presents the average ratio of capital expenditures to assets (the red line with circles) and the ratio of R&D expense to total assets (blue line with triangles) for the firms in our sample from 2011 to 2019.

significant increase in payouts if we define the post-TJCA period as starting from the December 31, 2017 fiscal year-end.

Second, in line with market expectations, we do not find that firms engage in higher levels of corporate investment after the TCJA (Table 8). Rather, we find negative and generally nonsignificant coefficients on *Post TCJA* with the exception of Column (2). *Post TCJA* is negative and significant in Column (2), implying that the TCJA may reduce certain forms of firm investment contrary to the arguments made by proponents of the Act.[26] However, we acknowledge that investments in new employees and facilities take place over an extended period. Therefore, our results do not rule out the possibility that both payouts and investments may increase over the long term due to the TCJA.

_____
[26] A portion of the reduction in R&D spending may be due to the reduction in R&D-based tax incentives discussed in Section 2.2.3.

7. Additional robustness analyses

7.1. Trump's election

While the Trump election at the end of 2016 increased the possibility of a tax reform, it was never certain that a tax bill would pass, and it was impossible to predict the specific provisions of the bill. As noted in Section 3.1, during most of 2017 the passage of a tax reform was still considered unlikely. By focusing on the TCJA's legislative window, we are able to study various TCJA provisions that were conceived of or drastically modified *only* during the TCJA's legislative period (see Appendix A). Therefore, a study of the TCJA differs distinctly from a study of the information available at the time of Trump's election. Based on this discussion and the fact that we examine post-TCJA firm behavioral responses, our paper is distinctly different from Wagner et al., 2018a, who study the stock market's response to the Trump election.

Table 8
Investment behavior after the TCJA.

	(1)	(2)	(3)	(4)
	Capex	Research & development	Capex	Research & development
Post TCJA	−0.002	−0.038**	−0.018	−0.005
	(−0.11)	(−2.37)	(−1.10)	(−0.53)
Cash flow / Lagged total	0.215***	−0.183***	0.066***	−0.087***
assets $_t$	(7.28)	(−6.18)	(3.78)	(−6.12)
Market leverage $_{t-1}$	0.024	−0.109***	−0.143***	−0.034***
	(0.68)	(−6.03)	(−6.39)	(−3.52)
Payout ratio $_t$	−0.073***	0.062***	0.016*	0.013**
	(−5.33)	(3.18)	(1.89)	(2.11)
Tobin's Q $_t$	−0.057**	0.304***	0.050***	0.051***
	(−2.18)	(8.39)	(2.80)	(2.66)
Fixed Effects	Industry	Industry	Firm	Firm
Clustered Standard Errors	Firm	Firm	Firm	Firm
N	8788	8788	8778	8778
Adjusted R^2	0.306	0.358	0.752	0.934

This sample consists of the 1217 unique firms in our sample and their fiscal year data from January 2011 to June 2019. *Post TCJA* is an indicator variable equal to one if a firm's fiscal year end falls on or after June 30th, 2018. All other variable definitions are provided in Appendix A. All continuous variables are winsorized at the 1% and 99% levels. All variables are standardized for ease of interpretation. Industries are defined by their 2-digit SIC codes. *T*-statistics are reported in parentheses under the coefficients. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Regardless, to ensure that the TCJA's legislative period provides significant additional information beyond the election of President Trump, we conduct several robustness tests. First, we re-run the specifications reported in Table 5 but include an additional regressor, the abnormal return on the day after the election of Donald Trump (i.e. November 9, 2016). As seen in Table IA.5 in the Internet Appendix, despite the inclusion of this additional variable, the results are quantitatively the same as those reported in Table 5. Notably, the coefficient on *Trump election abnormal return* is insignificant, suggesting that information that reached the market during the Trump election cannot predict which firms would gain or lose during the TCJA's legislative period. This result suggests that the market did not fully price in the TCJA following Trump's election. Additionally, Table IA.6 of the Internet Appendix provides a two-way table between firms that earned positive abnormal returns just after Trump's election and those that gained during the TCJA's legislative period. The matrix shows that many of the election winners were also beneficiaries of the TCJA; however, a number of firms that won after the election lost during the TCJA's period. Similarly, many firms that lost after the election gained due to the TCJA. For example, almost 30% (≈ 361/1217) of the firms in our sample were losers after the Trump election but actually gained during the TCJA's legislative period. Overall, these results demonstrate that the Trump election and the TCJA are two distinct events, with market reactions to the Trump election not fully anticipating the impact of the TCJA.

7.2. Alternate estimation window

Our results so far use abnormal returns estimated from September 2016 to August 2017, which includes the Trump election. We use this estimation window to capture stock market reactions to the TCJA beyond the effects of the Trump election that have already been incorporated into stock prices. In a robustness check, we re-estimate our abnormal returns using an estimation window before the Trump election, from October 2015 to September 2016. We re-run our multivariate regressions with these abnormal returns as the dependent variable. We find that the results are very similar quantitatively and qualitatively to those reported in Table 5. These results are presented in the Internet Appendix Table IA.7.

7.3. Correlation and multicollinearity issues

One potential concern with the results presented in Tables 5 and 6 is that the independent variables used in the regressions may be highly correlated, causing potential issues with multicollinearity. We present the pairwise correlation matrix in the Internet Appendix (Table IA.8). The highest correlation in the matrix is 0.41 between *Book leverage* and *Interest deductibility limited*, which is to be expected because higher leverage leads to higher interest expense. We also examine the variance inflation factors (VIF) associated with our variables of interest. Any VIF larger than 10 would indicate potential multicollinearity issues. Among our variables of interest, the highest VIF is 2.1, suggesting that multicollinearity is not a concern.

8. Conclusion

The Tax Cuts and Jobs Act of 2017 is the largest modification to the United States' corporate tax code in over 30 years. While the TCJA is generally marketed as a pure tax cut for corporations, it also raises corporate taxes for a number of firms and significantly modifies how multinational corporations are taxed. Given the number of new provisions introduced by the TCJA, the purpose of this study is to determine which shareholders see their wealth increase due to the tax reform and which experience a loss in their wealth. Moreover, we also analyze whether stock prices of firms with different levels of financial constraints, growth opportunities, and payout ratios respond differently to the TCJA.

We use an empirical method that is designed to capture the effect of regulation via prices on days on which expectations change. Our portfolio sorts show that the shareholders of firms with high cash-effective tax rates, net deferred tax liabilities, and capital expenditures experience a wealth increase. The main losers are shareholders of firms with net interest expenses that exceed the limit for interest deductibility and those with high tax loss carryforwards as well as firms with high R&D expenses, a high percent of foreign revenues, and high amounts of unrepatriated earnings.

Notably, the evidence from multivariate cross-sectional regressions shows that across all provisions under study the following have the greatest impact on firms: the cut in the corporate tax rate to 21%, limits to interest deductibility, restrictions on tax losses, and changes to international taxation. We do not

find that financially constrained firms or high growth firms benefit from the TCJA. However, we do find that shareholders of high-payout firms gain. Studying actual firm behavior after the TCJA, we find preliminary evidence in support of these findings. That is, in the period directly following the TCJA, firms increase payouts in the form of repurchases, but do not engage in increased investment.

Overall, we intend for our work to serve as a useful reference for future researchers in assessing what aspects of corporate policy change following the TCJA. While our study provides a comprehensive analysis of how the different provisions of the TCJA affect shareholder wealth, future research is required in order to understand how the comprehensive overhaul of the tax system influences corporate behavior, such as decisions on capital structure or strategies for foreign investment.

Credit Author Statement

Ivalina Kalcheva, James M. Plečnik, Hai Tran, and Jason Turkiela equally conceptualized the presented idea, gathered and cleaned the stock and financial data, developed the empirical methods and carried out the statistical analyses, validated the findings, and prepared the created work for publication. The authors took turns writing, reviewing, and editing the manuscript.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jbankfin.2020.105860.

Appendix A. Sample construction and variable definitions

We focus on firms incorporated in the US (i.e., those with CRSP share codes 10 or 11). These are the firms most affected by changes in US tax policy. For example, many of the reforms to international taxation are only legally binding to firms officially under the U.S. jurisdiction (i.e., headquartered in the U.S.).

We exclude financial firms and utilities from our sample. Financial firms are excluded as the high leverage that is typical for these firms does not have the same meaning as for nonfinancial firms, where high leverage is more likely to indicate distress (Fama and French, 1992). Utilities are dropped as these firms have much less discretion over their financing and investment decisions (Smith, 1986). Furthermore, financial firms and utilities are legislatively exempt from certain provisions in the TCJA such as the restriction on the deduction of interest. Section 163(j)(7) explicitly exempts utilities from this restriction, while Section 163(j) implicitly excludes banks by considering net interest expense. That is, firms with interest income will reduce the amount of expense subject to this restriction, leaving nearly all financial institutions unaffected.

We hand-collect data on unrepatriated earnings from 10-K filings. We follow Harford et al. (2017) and search each 10-K filing for variants of "undistributed", "unremitted", "unrepatriated", "permanently (re)invest(ed)", and "indefinitely (re)invest(ed)". We read the relevant paragraphs and extract the amount of unrepatriated earnings, usually contained in the "Income taxes" section of the "Notes to the Financial Statements". When the unit of the reported number is not clearly stated, e.g. "$10 billion," we obtain the unit from the beginning of the Notes to the Financial Statements. For example, AVX Corp reports that permanently reinvested earnings were "$1,035,000″ as of March 31, 2017. However, all numbers in the Notes to Financial Statements for AVX Corp are reported in thousands. Thus, AVX's unrepatriated earnings was $1.035 billion. AVX's 10-K filing is obtained at https://www.sec.gov/Archives/edgar/data/859163/000085916317000028/avx-20170331x10k.htm. We identify 705 firms with reported permanently reinvested earnings, while the rest of the firms in our sample do not disclose any information. Following Williams (2018), we replace these missing values with zero, as 405 out of the 512 non-disclosing firms report no foreign income taxes paid, or they report foreign income taxes paid less than $1 million.

Variable	Definition	Source
Daily stock returns (%)	Variable RET in CRSP * 100	CRSP Daily File
Cash ETR (%)	Cash effective tax rate estimated = Income taxes paid/(Pretax income − Special items) = TXPD/ (PI-SPI) (*100) (averaged over last three years)	Compustat
Net deferred tax liabilities (assets) (%)	Deferred tax liabilities minus deferred tax assets, scaled by total assets = (TXNDBL-TXNDBA)/AT (*100)	Compustat
Capex (%)	Capital expenditures scaled by total assets = CAPX/AT (*100). It is set to zero if missing.	Compustat
Interest deductibility limited	Indicator variable equal to 1 if total interest expense is larger than the sum of total interest income and 30% of earnings before interest and taxes, i.e., XINT>(IDIT+0.3*EBIT)	Compustat
Net interest expense exceeding 30% EBIT (%)	Interest expense minus sum of interest income and 30% of earnings before interest and taxes, scaled by total assets ==(XINT − (IDIT+0.3*EBIT))/ AT (*100)	Compustat
Book leverage (%)	Total debt/Total assets = (Long-term debt + Current debt)/ Total assets = (DLTT+DLC)/AT (*100)	Compustat
Tax loss carryforward (%)	The balance of tax loss carryforward scaled by total assets = TLCF/AT (*100). It is set to zero if missing.	Compustat
R&D expense (%)	Research & development expense, scaled by total assets = XRD/AT (*100). It is set to zero if missing.	Compustat
Revenues from foreign operations (%)	Revenues from foreign operations/Total revenues (*100)	Factset, Compustat Segments
Unrepatriated earnings (%)	Unrepatriated earnings, scaled by total assets (*100)	10-K filings, Compustat
Log(market cap)	Natural log of market capitalization as of the fiscal year end	Compustat
Market-to-book ratio	Market value of equity/ Book value of equity, i.e., PRCC_F*CSHO/sum(SEQ, TXDB, ITCB, -PREF)	Compustat
Size-age index	−0.737 * size + 0.043 * $size^2$ − 0:040 * age, where size is the log of inflation-adjusted total assets, capped at the log of 4.5 billion, and age is the number of years the firm is listed with a non-missing stock price on Compustat, capped at 37 years.	Compustat
Tobin's Q	(Total assets − book value of equity + market value of equity) / Total Assets, i.e., (AT - sum(SEQ, TXDB, ITCB, -PREF) + PRCC_F*CSHO)/AT	Compustat
Payout ratio	(Dividends for common stocks + Dividends for preferred stocks + Share repurchases) / Operating income before depreciation, i.e., sum(DVC, DVP, PRSTKC)/OIBDP	Compustat
Dividend ratio	Dividends for common and preferred stocks/Operating income before depreciation, i.e., sum(DVC, DVP)/OIBDP	Compustat
Repurchase ratio	Share repurchases/Operating income before depreciation, i.e., PRSTKC/OIBDP	Compustat
Firm age	Current fiscal year minus first year of appearance	Compustat
Log (Total assets)	Natural log of the firm's total assets as of the fiscal year end	Compustat
Losses	Number of times the firm has experienced negative net income (NI) from the previous five fiscal years	Compustat
Market leverage	Total debt/(Total assets − book equity + market value of equity) = (DLTT+DLC)/(AT − CEQ + PRCC_F * CSHO)	Compustat
Volatility	Standard deviation of monthly market-adjusted returns for the fiscal year	Compustat
Cash flow volatility	Standard deviation of cash flow-to-assets from the previous ten fiscal years. The firm is required to have at least three observations. Cash flow-to-assets is operating income before depreciation (OIBDP) divided by total assets (AT)	Compustat
Trump election abnormal return	Abnormal return on the data after the election of Donald Trump (November 9, 2016), measured using the Fama-French-Carhart four-factor model.	

Appendix B. Legislative timeline and additional details for each provision

The table below presents the change in probability of passage for each TCJA provision that we study. We denote with a (+) or (-) days on which the probability of passage of a particular tax provision increases or decreases. We denote with a (?) days on which a direct sign cannot be assigned. Below the table are more details for each provision.

	9/27	10/5	10/20	10/26	11/2	11/8	11/9	11/15	11/16	11/17	11/28	11/30	12/1	12/4	12/6	12/14	12/15	12/19	12/20	12/22
Overall likelihood of TCJA Passage																				
+	+	+	+	+	+	–	–	–	+	+	+	+	–	+	+	–	+	+	+	+
Tax-cutting provisions:																				
Corporate tax rate of 21%	+	+	+	+	+	–	–	–	+	+	+	+	–	+/-	+/-	–	+/-	+	+	+
100% bonus depreciation	+	+/?	+/?	+/?	+	–	+/-	–	+	+	+	+	–	+	+	–	+	+	+	+
Tax-increasing provisions:																				
Interest expense deduction restriction	+	+/?	+/?	+/?	+	–	+/-	–	+	+	+	+	–	+	+	–	+	+	+	+
Limitations on deductions of NOLs	N/A	N/A	N/A	N/A	+	–	+/-	–	+	+	+	+	–	+	+	–	+	+	+	+
Amortization of R&D and relation restrictions	N/A	N/A	N/A	N/A	N/A	N/A	+/-	+/-	+	+	+	+	–	+	+	–	+	+	+	+
Changes to International Taxation (and related confounding BEAT/GILTI/FDII):																				
Shift to modified territorial taxation	+	+/?	+/?	+/?	+	–	–	–	+	+	+	+	–	+	+	–	+	+	+	+
(BEAT/GILTI/FDII)	N/A	N/A	N/A	N/A	N/A	N/A	+/-	–	+	+	+	+	–	+/?	+/?	–	+	+	+	+
One-time transition tax on unrepatriated earnings	+	+/?	+/?	+/?	+	–	–	–	+/-	+/-	+/-	–	–	+/?	+/?	–	+	+	+	+
Tax simplifying provisions (and related confounding Individual Mandate Repeal):																				
Repeal of corporate AMT	+	+/?	+/?	+/?	+	–	+/-	–	+	+	+	+	–	–	–	–	+	+	+	+
(Individual mandate repeal)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	+	+	+	+	+	–	+	+	–	+	+	+	+
Repeal of domestic production activities deduction	+	+/?	+/?	+/?	+	–	+/-	–	+	+	+	+	–	+	+	–	+	+	+	+

Corporate tax rate of 21%: A significant rate reduction was always included in the TCJA. This rate was set to 20% during the majority of the legislative process. Overall, as a similar rate reduction was included in all versions of the law, the likelihood of a significant rate cut and the likelihood of the bill's passage are similar. During the Conference Committee Process (CCP), a 22% rate appeared likely. At the end of the process, a compromise rate of 21% was selected and passed into law. We mark the days in which a higher rate appeared likely (or was confirmed as on November 15) as "+/-", as firms with high tax rates may have experienced negative returns due to the higher than expected rate.

100% bonus depreciation: Immediate expensing of capital expenditures was an uncontentious focus of tax reform since the inception of the TCJA. It had broad bi-partisan support (having been recently utilized by the Obama administration) and did not change throughout the legislative process. Though Novermber 9 was a controversial day for the TCJA, It can be argued that the likelihood of for this provision increased on November 9 when the Senate officially added the provision (hence the +/- on that date). Overall, the likelihood of immediate expensing roughly mirrors the likelihood of the law's passage. However, we note that during the budgetary allocation phase of the TCJA (10/5 through 10/26), immediate expensing was not officially a part of the proposal. Therefore, we mark these dates as "+/?" in order to recognize the fact that immediate expensing was potentially benefiting from the fact that a bill was moving forward, but it was not formally included in a bill at that time. The final version of this provision provides immediate 100% expensing extends through 2022 (5 years). In 2023, the provision begins to phase out 20% per year over the next five years (thereby reaching 0% after 5 years of phasing out). Assets bought during any part of the TCJA's legislative process (starting on September 27) are eligible for immediate expensing. This retroactive provision is frequently included in tax reforms to prevent firms from avoiding capital asset purchases during the legislative process. Compared with prior law, immediate expensing under the TCJA is guaranteed for a longer period than under any prior iteration and it applies to more assets (i.e., both new and used). Bonus depreciation has been implemented to varying degrees since it was first established by the Job Creation and Worker Assistance Act of 2002. Prior versions of bonus depreciation were short-term and generally allowed for the expensing of 30–50% of the asset's total cost. However, the bonus depreciation provision established by the Tax Relief Act of 2011 allowed for the immediate expensing of 100% of new capital asset purchases over a roughly 16-month period.

Interest expense deduction restriction: Restricting the deductibility of interest was a goal of tax reform from the beginning of the process. The House consistently contained language that restricted the deductibility of interest to 30% of adjusted taxable income (based on EBITDA), and on November 9 the Senate adopted similar 30% restriction (but based the restriction on EBIT) on an otherwise controversial day for the law (hence the "+/-" on that date). During CCP, lawmakers adopted both restrictions over different timeframes (EBITDA from 2017 to 2021, and EBIT from 2022 onward). Finally, as with many provisions, in the early budget-focused stages (10/5 through 10/26) an interest restriction was not explicitly included. However, the bill moving forward likely increased the chances of the provision being included.

Limitations on deductions of NOLs: Limiting the deductibility of NOLs was not an initial objective of the TCJA, however, the House added a version of the provision (in which 90% of income could be eliminated by NOLs) on November 2. The Senate adopted a similar limit (80%) on November 9; however, the 9th was a controversial day for the bill and the overall chance of passage likely decreased (hence the "+/-" on that date). The Senate added a delay (until 2024) to the NOL limits on November 15. Eventually, after the CCP, the Senate version of NOLs limit was adopted on the House's timeline (i.e., immediately). These NOL restrictions do not apply to pre-2018 NOLs, but firms which regularly rely on NOLs may have their long-term NOL accumulation and use strategies modified by the TCJA (e.g., airlines). This provision shifted somewhat throughout the legislative process, with the Senate initially choosing to institute an 80% threshold and a delay of NOL changes until 2024. The House chose a 90% threshold and no delay.

Amortization of R&D: A limit on R&D expense was not in the initial framework of the law, but the House adopted R&D amortization on November 9. However, the 9th was a difficult day for the overall bill (hence the +/- on that date). On November 15, yet another controversial day for the bill, the Senate added nearly identical language (with a different start-date being the only material difference) on R&D amortization to their version of the TCJA. Therefore, if the bill passed, it appeared likely to include R&D amortization, but the passage of the bill appeared uncertain (hence the +/- on that date). Eventually R&D amortization was adopted using the House's start-date of 2022.

Shift to modified territorial taxation: As a key structural reform in the TCJA, territorial taxation was a feature in every proposal and bill throughout the process. The likelihood of territorial taxation mirrors the likelihood of the TCJA passing. However, it was technically not included in the budgetary phase (10/5 through 10/26), though it likely benefited from the bill moving forward (hence the +/? on these dates).

BEAT/GILTI/FDII: The Base Erosion Anti-abuse Tax (BEAT), the tax on Global Intangible Low Taxed Income (GILTI), and the deduction for Foreign-Derived Intangible Income (FDII) were first officially introduced by the Senate on November 9 in order to prevent abuse of territorial taxation. However, as mentioned, the 9th was a controversial day which may have reduced the likelihood of the TCJA's passage (hence the +/- on that date). The likelihood of the BEAT/GILTI/FDII somewhat mirrored the likelihood of the overall bill passing through most of the process; however, during the CCP it became clear that various House provisions were being selected over Senate provisions. Therefore, though the BEAT/GILTI/FDII were viewed as the likely measures to police the use of territorial taxation, it was possible that alternatives would be selected based on the overall CCP. Hence, we mark the CCP as "+/?" (it was likely that something like the BEAT would be implemented, but the form was uncertain). The final versions of these provisions comprise a multifaceted system of tax incentives and increases. The first prong of this system is a minimum tax on Global Intangible Low-Taxed Income (GILTI). The GILTI tax imposes an effective tax rate of 10.5%–13.125% on investment returns in excess of an "ordinary" 10% return. These excess returns are presumed to be the result of intellectual property profit shifting. The second prong, the Foreign-Derived Intangible Income deduction (FDII), provides a lower rate (13.125%) to income inferred to be from U.S.-based innovation resources that are used in the exporting of products and services, encouraging firms to keep easily movable innovation resources in the United States. While the new system contains both additional taxes (e.g., GILTI) and incentives (e.g., FDII), the combined impact is expected to be a tax increase for the U.S. budget (Table 1). Next, and perhaps most prominently, the TCJA's Base Erosion and Anti-abuse Tax (BEAT) system is aimed at preventing multinational corporations from shifting U.S. profits to overseas entities. Specifically,

firms that make significant deductible payments to foreign subsidiaries ("base erosion" payments) are subject to a minimum tax to prevent firms from shifting income from the U.S. to exploit territorial taxation.

One-time transition tax on unrepatriated earnings: The one-time transition tax (deemed repatriation) changed significantly throughout the process. While a deemed repatriation was an objective from the beginning of the process, the House selected a 12% (5% illiquid) rate (November 2) and officially increased this rate to 14% (7% illiquid) on the 16th, while the Senate selected a 10% (5% illiquid) rate (November 9) and kept the rate constant until the end of the process. We place a "-" on the 9th as the likelihood of passage was decreasing and the rate of the tax (if passed) was also decreasing. As the Senate bill appeared to be growing in dominance (from November 16 to November 28) it appeared likely that there would be a deemed repatriation at a lower rate (hence the "+/-" on these dates). We mark December 2 a "+" as the Senate sharply increased (to 14.49%, 7.49% illiquid) the amount of the deemed repatriation tax the night before passing their version of the TCJA. We mark December 4 and December 6 as "+/?" due to the increased likelihood of passage, but uncertainties about the final rate. The final version of the TCJA further increased the deemed repatriation tax to 15.5% (8% liquid) during the CCP. Finally, as with many provisions, in the early budget-focused stages (10/5 through 10/26) a deemed repatriation was not explicitly included. However, the bill moving forward likely increased the chances of the provision being included. Based on the amount of expected tax revenue and the two applicable tax rates, the JCT estimates that the tax will apply to a multi-trillion-dollar sum. Their exact estimate is not provided. www.jct.gov/publications.html?func=startdown&id=5053.

Repeal of domestic production activities deduction (DPAD): The DPAD was a 9% deduction based on domestic production expenditures. Due to the complexity of this provision, the full 9% deduction was rarely obtained. On average, this deduction reduced the taxable incomes of manufacturing firms by 5% (https://www.irs.gov/pub/irs-soi/13coccr.pdf). Repeal of the DPAD was included in the initial framework of the TCJA. It was officially adopted by the House on November 2, and officially adopted by the Senate on November 9. Though the events on November 9 decreased the likelihood of overall passage, the fact that the Senate adopted the House's repeal of the DPAD implies that the likelihood of this particular provision being repealed increased (hence the +/- on that date). Finally, as with many provisions, in the early budget-focused stages (10/5 through 10/26) the DPAD repeal was not explicitly included. However, the bill moving forward likely increased the chances of the provision being included.

We attempt to isolate the impact of the repeal of the DPAD through industry analysis. However, we acknowledge that a number of industries were eligible for domestic production subsidies – ranging from pharmaceuticals to technology firms. These various industries are the subject of many disparate TCJA changes, making the impact of manufacturing subsidies difficult to isolate by industry.

Repeal of the corporate Alternative Minimum Tax (AMT): The AMT was a second tax system for corporations intended to force all corporations to pay a tax on a reasonable level of income (i.e., it was intended to prevent excessing tax avoidance). The repeal of the AMT substantially contributed to tax simplification as calculating a corporation's AMT involved a second tax calculation in which a number of deductions, credits, and other items were barred or reduced. If the AMT income (taxable income after reduced deductions/credits/etc.) amount was greater than a corporation's standard IRS taxable income, the AMT was paid. The repeal of the corporate AMT was included in all House versions of the TCJA, and appeared to gain momentum on November 9 when the Senate adopted similar language to the House. While the 9th was a dif-

ficult day for the overall passage of the TCJA, the House-Senate agreement marked significant progress for the repeal of the AMT (hence the "+/-" on that date). While the repeal of the AMT was a major objective of tax reform, the Senate excluded this repeal from the bill passed on December 2. Eventually, during the CCP, AMT repeal was re-adopted by the Senate. This resulted in a last-minute full repeal of the AMT. Finally, as with many provisions, in the early budget-focused stages (10/5 through 10/26) AMT repeal was not explicitly included. However, the bill moving forward likely increased the chances of AMT being repealed.

We attempt to isolate the impact of the AMT repeal through industry analysis. That is, we study the health insurance and mining industries as the vast majority of AMT "Adjustment and preference items" related specifically to mining/oil industry intangible drilling costs, mining/oil industry excess depletion, and health insurance industry Section 833(b) deductions. This information is drawn from the most recent comprehensive report on the corporate AMT available at https://www.irs.gov/pub/irs-soi/13co23ccr.xls. However, while these industries likely benefit from the AMT's repeal, we note that the repeal may be confounded by late 2017 oil price fluctuations and the repeal of the "individual mandate" (which should substantially reduce health insurance customers).

Individual mandate repeal: The individual mandate was a penalty tax imposed on individuals who failed to purchase insurance meeting certain requirements. While the repeal of this provision technically reduces a small tax, the repeal of this tax is expected to save the government $338 billion by reducing the purchase of government subsidized insurance from private firms. See, for example, the analysis of the Congressional Budget Office: https://www.cbo.gov/publication/53300. The House version of the TCJA did not include this provision. However, on November 15, the Senate added the repeal of the individual mandate into their version of the TCJA. This arguably made the passage of the law much more difficult. This provision was accepted by the House during the CCP. The impact of the Individual Mandate repeal likely confounds the benefits of the repeal of the AMT (as the AMT impacted health insurers significantly).

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