

Title: Did the Tax Cuts and Jobs Act Stimulate Capital Expenditures? A Firm-Level Approach

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Abstract

We investigate whether the Tax Cuts and Jobs Act (TCJA) of 2017 motivated firms to increase capital investments. Using a unique approach that identifies firm-level tax benefits and incentives introduced by the TCJA, we find that firms that realized tax benefits increased their investment in fixed assets in the following year. Specifically, as a result of the change, an increase in forecasted earnings and an increase in nonrecurring tax benefits stimulated growth in capital investments. We also find that the investment-inducing effect of the TCJA was larger for firms with a higher cost of capital and for those with better alignment between management and shareholder interests. Although our study is not able to explain the long-term consequences of TCJA, it improves upon the previous literature showing that the mixed findings of previous studies may be the result of the unequal distribution of tax benefits among firms.

Keywords: Corporate Tax Rate, TCJA, Tax Law, Capital Investment, Corporate Governance

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1. Introduction

Public Law 115-97, or the Tax Cuts and Jobs Act (TCJA), which became effective in December 2017, aims to stimulate private investments and boost long-term growth in the United States.⁴ It significantly decreases the corporate tax rate from 35% to 21% and introduces other changes to both corporate and individual taxes.⁵ Whether the TCJA has effectively stimulated corporate investment remains unresolved. This paper seeks to answer this question and correct for measurement issues in previous studies by using several measures aimed at capturing specific tax benefits and incentives introduced by the subsections of the TCJA. We also investigate whether firm characteristics moderate the impact of the TCJA on firms' capital expenditure decisions.⁶

There are several reasons why the TCJA may stimulate capital expenditures. First, lowering the corporate tax rate from 35% to 21% provides cash savings and reduces taxes for pre-TCJA tax liabilities. Pursuant to ASC 740, firms with higher deferred tax liabilities (tax assets) recognize a tax benefit (expense) and have greater (less) resources to invest. Second, a corporate tax cut lowers the hurdle rate for investment projects, incentivizing firms to invest more in capital assets, as predicted by traditional investment theory. The TCJA's increase in the allowable deduction for bonus depreciation from 50 percent to 100 percent and the maximum deduction from \$500,000 to \$1 million may give firms additional incentive to increase

⁴ Tax foundation reviewed the economic impact of the TCJA and published it at <https://taxfoundation.org/tcja-one-year-later/>.

⁵ Under pre-TCJA law, C corporations pay federal income tax at graduated rates of 15% on taxable income of \$0 to \$50,000; 25% on taxable income of \$50,001 to \$75,000; 34% on taxable income of \$75,001 to \$10 million; and 35% on taxable income over \$10 million. Personal service corporations (PSCs) pay a flat 35% rate. For tax years beginning in 2018 or later, the TCJA establishes a flat 21% corporate rate, and that rate also applies to PSCs. For more details, please refer to <https://www.irs.gov/newsroom/tax-cuts-and-jobs-act-a-comparison-for-businesses>.

⁶ We focus on capital expenditures for two reasons. First, not all firms report R&D expenditures which limits available data. Second, we focus on expenditures that are meant for long-term expansion. We expect that the changes in tax code brought by the TCJA are more likely to impact long-term capital expenditures.

investment. Because this benefit is phasing out in 2026, firms are likely to increase capital expenditures in the early years of the TCJA.

Third, the lower tax rate makes domestic investment attractive relative to alternatives.

After the TCJA, the U.S. tax rate has become more competitive among developed economies,⁷ and the switch to a territorial tax system allows U.S. firms to repatriate future profits without penalty (Albertus et al. 2019), decreasing the likelihood of profit transferring to low-tax countries and increasing the likelihood of domestic investment.

Stronger consumer demand could be another driving force for more investment. The TCJA changes the individual tax code significantly, albeit temporarily, for tax years 2018 through 2025. The Tax Foundation's 2018 report estimates that about 80 percent of individual taxpayers paid less tax in 2018, another 15 percent had trivial changes, and only 5 percent paid significantly higher taxes in 2018 than they did in 2017 due to the changes in TCJA.⁸ Due to abovementioned reasons, we expect that following the TCJA, firms that benefited from lower corporate taxes increased their investments.

Meanwhile, some other changes may lead to a decrease in corporate investments. For example, a one-time repatriation tax on accumulated untaxed earnings of foreign subsidiaries, amortization of research and development expenses, reduced interest deductibility, and adjustments to other business deductions may discourage investment. On the individual tax side, regulatory caps on the deductions of state and local income taxes, and mortgage interest, and the

⁷ For instance, the 2018 combined corporate tax rates are 26.78%, 34.43%, 29%, 27.81%, 29.74% and 19% in Canada, France, Germany, Italy, Japan, and the United Kingdom, respectively (OECD: https://stats.oecd.org/index.aspx?DataSetCode=Table_I11). The federal tax rate is 21%, which is adjusted for states that levy state income taxes as well. Corporations need to pay state income taxes at various levels in 44 states. Nevada, Ohio, Texas, and Washington impose gross receipts taxes instead of corporate income taxes. South Dakota and Wyoming are the only states that do not levy either tax.

⁸ For more details, see <https://taxfoundation.org/tcja-one-year-later/>.

suspension of the deduction of home equity interest may weaken consumers' purchasing power (Li and Yu, 2020).

It is also difficult to predict management's response to the changes in tax rules.

Stewardship theory predicts that managers prioritize maximizing business profits, which could lead to more investment after the TCJA. Alternatively, agency theory suggests that managers may prioritize their own goals over long-term business growth, resulting in reduced investments, because the investment reduces return on assets ratio, hence the profitability ratio based compensation.

The prior literature on the effects of the TCJA provide disappointing findings. For example, Kopp et al. (2019) find that while U.S. business investment since 2017 has grown strongly due to a growth in aggregate demand, it has fallen short of predictions based on the postwar relation with tax cuts. Viswanathan and Cohen (2020) argue that the anticipated economic benefits of the TCJA due to its changes to effective corporate tax rates have yet to be observed. Kalcheva et al. (2020) find that tax changes exert no impact on capital expenditures for the 2018 fiscal year, while Bennett and Wang (2021) find no impact for the first nine months of 2018. Similarly, Gale and Haldeman (2021) show that investment growth after the TCJA was driven by factors unrelated to the incentives offered in the TCJA. Dowd and Landefeld (2018) focus on one particular provision and predict significant, but highly concentrated, benefits to firms - particularly in the manufacturing, information, and professional services sectors. According to Arnon (2019), the increase in oil prices may explain the aggregate growth in investment in the post-TCJA period, with the effect concentrated in oil and mining industries.

Our paper improves upon these previous studies by relating firms' investment activities directly to the benefits they receive from tax changes. Unlike previous studies that use a dummy

variable to measure the impact of the TCJA (Kalcheva et al., 2020; Bennett and Wang, 2021), our research focuses on specific tax benefits and expenses introduced by the TCJA. Additionally, our approach avoids endogeneity problems and other confounding factors that could influence the results in aggregate time-series studies.

We examine investments in fixed assets for a sample of public firms around the TCJA of 2017. We measure the short-term impact of the TCJA by examining changes in one-year-ahead analyst forecasts of earnings per share before and after the Senate passage date (EPS Change). We believe EPS Change captures the effects of the TCJA since analysts are expected to update their forecasts to preserve their reputations in accuracy. Moreover, no other major event occurred during this short time window. Consistent with the expectation, we show (in Figure 1 of the Online Appendix) that the revision rate of analyst earnings forecasts increased significantly with the passage of the TCJA. We also show (Table OA1 in the Online Appendix) that analysts post significantly higher revisions in magnitude in 2017 in comparison to other years without significant tax legislation, and that their revisions in 2017 resulted in improved accuracy in predicting actual earnings.

We find that firms' capital expenditures in 2018 are positively related to earnings forecast changes. Our estimate suggests that the TCJA increased capital expenditures by over \$25 billion for our sample firms and by nearly \$35 billion for all publicly listed U.S. firms. To express it differently, a \$1 increase in mean (median) EPS from the TCJA led to a \$17.31 (\$23.22) million increase in capital investment in 2018. When compared to the median annual change in capital expenditures in the 2012-2018 period of \$147,000⁹, the economic effect of the TCJA on capital

⁹ We calculate the median value of the percentage change in capital expenditure defined as $(\text{CAPEX}_t - \text{CAPEX}_{t-1})/\text{CAPEX}_{t-1}$ for the period from 2012 to 2018. The subprime mortgage crisis occurred between 2008 and 2010. So, we start data collection from 2011 to avoid the confounding effect of the crisis. However, due to the calculation of changes in a number of variables, we can make cross sectional comparisons from 2012 only.

expenditures is significant in economic terms. Consistent with the stewardship theory firms with greater expected benefits from the TCJA increase their capital investments more in 2018.

In addition to changes in analyst forecasts, we examine the subsections of the TCJA to provide direct evidence of the TCJA's effect on firms' financial measures and investment. First, following Donelson et al. (2022), we use nonrecurring income taxes reported in the fourth quarter of 2017 to capture the tax effects of the TCJA.¹⁰ Nonrecurring income taxes reflect gains or losses accrued due to a lower corporate tax rate and the one-time repatriation income tax. We find that, on average, companies receiving an additional \$1 million in Nonrecurring Tax benefits raised their capital expenditures by \$40,000 in 2018.

Nonrecurring income taxes combine remeasurement of deferred tax liabilities and assets and repatriation income taxes. Following Mishler (2018), we separate nonrecurring income taxes into these components. The results show that nonrecurring income taxes impact firms' capital investments in the first TCJA tax year through the remeasurement gains (losses) of deferred tax liabilities (assets).

We also examine the moderating effect of firm specific characteristics. First, we argue that firms with a higher cost of capital will benefit the most from lowering the hurdle rate for their investments, making it possible to raise sufficient funds for new investments. Our results confirm these expectations, as firms with a higher weighted average cost of capital (WACC) before TCJA increase their capital expenditures the most in 2018.

¹⁰ One limitation associated with nonrecurring income taxes is that this variable also includes resolutions of tax audits, valuation allowance changes, and mergers. We are not able to subtract these values from the variable. In the Online Appendix, we report Figure 2 showing that the number of firms disclosing nonrecurring income taxes is about nine times higher at the end of 2017 than in comparable periods between 2012 and 2018, providing evidence that TCJA had an important impact on nonrecurring income taxes.

Second, we examine the role of incentives offered to executives from an agency perspective. Firms with aligned management-shareholder interests face fewer agency problems, giving managers stronger incentives to invest in fixed assets to meet greater customer demand and fulfill their stewardship duty. Following Coles et al. (2006), we use two metrics, Delta and Vega to measure executive incentives. The results show that firms with greater pre-TCJA Delta made significantly greater investment in fixed assets in 2018, confirming our expectation that firms with better alignment between management and shareholders invested more.

We also investigate the economic consequences of TCJA on firm valuation and investment persistence. Using a two-step model, we find a positive relationship between expected capital expenditure and the market adjusted (and unadjusted) buy-and-hold abnormal returns in 2018, suggesting that the capital markets respond positively to additional capital expenditure induced by the TCJA. We also find that both the indirect (EPS Change) and direct (nonrecurring income taxes) measures of TCJA benefits (at the time of the tax change) are negatively associated with capital expenditure in 2019, suggesting a short-term TCJA effect. Future research may shed more light on the persistence of the TCJA's impact.

To address the possibility that the increase in capital investment may not be solely due to the TCJA, we perform a difference-in-differences analysis using Canadian firms as the control group. Our results in Table 10 show that US firms increase their investment after the passage of the TCJA more than Canadian firms do. We also conduct multiple robustness checks to confirm the validity of our results and rule out alternative explanations.

Our paper contributes to the literature in multiple ways. First, we extend the growing body of studies on the effects of the TCJA on corporate investments. Unlike previous studies (Dowd and Landefeld, 2018; Kopp et al. 2019; Kalcheva et al., 2020), we conduct firm-level

empirical analyses focusing on specific subsections of the TCJA and use multiple measures to capture its impact. We show a direct relationship between the TCJA and investment in fixed assets. Firms receiving specific tax benefits invest more after the passage of the TCJA, providing a clearer understanding of how the TCJA affects corporate investment in fixed assets.

Second, our paper contributes to the value relevance literature. There is a long debate on the value relevance of accounting information over time (Barth et al., 2021; Chang, 1999; Brown et al. 1999; Collins et al. 1997; Francis and Schipper 1999; Kim and Kross 2005). The implementation of the TCJA allows us to examine whether earnings- or growth-related measures weigh more in investors' decisions. We find that while the investment induced by the TCJA reduces return on assets in 2018, it is positively associated with buy-and-hold abnormal return in 2018. This suggests that accounting information about future growth is more relevant to capital market participants.

Third, we contribute to tax research by examining how firm-specific factors moderate the impacts of a tax change – an area of research called for by Hanlon and Heitzman (2010). Our analysis of cross-sectional differences shows that these differences might explain why previous studies did not find significant effects of the TCJA on investments in 2018. Specifically, we find that firms featuring higher WACC and lower agency problems invested more in fixed assets in 2018. In a closely related paper to ours, Beyer et al. (2023) examine MNCs' responses to the TCJA and find that domestic capital expenditures increase for MNCs with low domestic liquidity and high domestic investment opportunities. We extend their analysis and show how specific benefits of the TCJA affected firms' investment behavior. In addition, our paper focuses on a different subset of firms, different measures of the benefits of the TCJA, and mainly on the response to the change in corporate tax rate.

Our study provides unique insights on specific aspects of the tax change not examined by other studies. These insights can be valuable for policymakers in shaping future tax policies. However, due to sample period limitations we are not able to measure the long-term impacts of TCJA on investment (e.g. benefits of switching to a territorial tax system, long-term consumer demand effects, and multi-year investment and research and development projects).

The rest of the paper is organized as follows. Section 2 describes the data, sample selection, and research design. Section 3 presents the empirical results, while Section 4 provides our conclusions.

2. Data, Sample Selection, and Research Design

2.1 Data, Sample Selection

The data used in this study are from four publicly available sources: financial statement data from Capital IQ, sell-side analyst data from the Institutional Brokers Estimate System (I/B/E/S) database, stock return data from the CRSP database, and executive compensation data from the Execucomp database. The sample selection process identifies 3,845 domestic firms that reported capital expenditure in 2018. We exclude firms in the financial industry. The primary dataset includes 1,569 observations of domestic firms, as they are under greater influence of the TCJA and less likely to shift profit overseas to take advantage of lower taxes in other countries (Dobbins and Jacob, 2016). Table 1 presents the sample distribution by industry, with manufacturing and services accounting for the majority of the sample.

2.2 Research Design

Our study measures the immediate direct benefits and costs introduced by the TCJA to better gauge its total impact on firms. First, we examine the effect of changes in analyst forecasts

of one-year-ahead earnings per share (*EPS Change*), which we calculate as the percentage change in most recent analyst forecasts of EPS around the Senate passage date of the TCJA.¹¹ The passage of TCJA may result in a lower corporate tax, a shift of business from overseas to the domestic market, and a higher demand for goods and services (although changes in forecasts of one year ahead EPS are unlikely to capture changes in consumer demand that are likely to be felt much later). All of these changes jointly determine future EPS, and thus should be incorporated to analysts' revised EPS forecasts. We also compare the number and magnitude of analyst forecast revisions around the passage of the TCJA with the corresponding period from 2012 through 2018. We find that both revision rate and magnitude of analyst forecasts around the TCJA increase significantly (Table OA1 and Figure 1 in the Online Appendix). We also find that the revisions in 2017 significantly improved the accuracy of earnings forecasts.

We use most recent revisions just before and after the passage of TCJA to capture the impact of TCJA on firm performance. Almost all revisions were completed within 30 days after December 20, 2017 and before the passage of the 2018 Bipartisan Budget Act (BBA) on February 9th and other major events in 2018 that may affect EPS. We calculate mean and median *EPS Change* for each firm and use it as our first measure of the TCJA effect. The coefficient estimate on *EPS Change* should be positive if the expected benefits result in greater investment.

We acknowledge that there could be an endogeneity issue associated with the first measure. Analysts' optimistic forecasts might reflect an expectation that firms will increase investment because of the tax change, suggesting simultaneity between the investment decision and the analyst forecast. We mitigate this potential endogeneity concern by introducing a second,

¹¹ The TCJA bill passed in the House on December 19, 2017 and in the Senate on December 20, 2017. Two days later, President Donald Trump signed the bill into law. Given President Trump was the strong supporter of this bill, we assume firm managers would expect that this bill was sure to be signed by the President. We assume financial analysts started mulling the revision of their EPS forecasts after December 20, 2017.

more direct measure of the impact of TCJA on the firms' financial statements. We utilize firm-level disclosure of nonrecurring income tax (*Nonrecurring Tax*) expenses. This is independent of the changes in analyst forecasts and less prone to measurement errors. Specifically, we focus on the 2017Q4 *Nonrecurring Tax* values, which include the remeasurement of *Deferred Tax Liabilities* and *Deferred Tax Assets* due to changes in corporate tax rates, as well as the one-time repatriation income tax (*Repatriation Tax*). We believe Nonrecurring Tax values in 2017 reflect the effect of TCJA because the number of firms that reported this tax was nine times higher in December 2017 compared to December in non-TCJA years. No other nationwide event could explain this increase.

We multiply reported *Nonrecurring Tax* by negative one, so that positive values indicate nonrecurring income tax benefits. We also scale it by 2017 total assets. In addition, we disentangle the effects of remeasurement of *Deferred Tax Liabilities*, *Deferred Tax Assets* and *Repatriation Tax* on a firm's investment decisions. The TCJA decreased the corporate tax rate from 35% to 21% starting in 2018, causing firms to re-measured *Deferred Tax Liabilities* and *Deferred Tax Assets* at the new rate. A firm with more *Deferred Tax Liabilities* would recognize less tax payable – a tax benefit in the post-TCJA period, whereas a firm with more *Deferred Tax Assets* would recognize less tax refundable – a tax loss. Therefore, we expect that TCJA would increase resources for firms with higher net *Deferred Tax Liabilities* than net *Deferred Tax Assets*, increasing capital expenditures. Following Mishler (2018), we first estimate the remeasurement gains (*Remeasurement Gain*) and losses (*Remeasurement Loss*) separately based on a firm's fourth quarter *Deferred Tax Liabilities* and *Deferred Tax Assets* in 2017. To estimate the net tax effect of remeasurement and *Repatriation Tax* for each firm, we subtract *Remeasurement Loss* from *Remeasurement Gain* and then subtract the result from *Nonrecurring*

Tax. It is important to note that the *Repatriation Tax* measures the immediate cash impact of paying the one-time repatriation tax, and not the benefits resulting from avoiding future repatriation taxes.

Using these measures of direct benefits of the TCJA, we formulate the relationships between capital expenditure in 2018 ($\text{Inv}_{i,18}$) and *TCJA_effect* in model (1):

$$\text{Inv}_{i,18} = a_0 + b_1 \text{TCJA_effect}_i + b_2 \text{Log Total Assets}_{i,17} + b_3 \text{EBIT}_{i,17} + b_4 \text{Sales}_{i,17} + b_5 \text{Debt}_{i,17} + b_6 \text{Loss}_{i,17} + b_7 \text{Operating Cash Flows}_{i,17} + b_8 \text{Dividends}_{i,17} + b_9 \text{Cash Flow Volatility}_{i,17} + b_{10} \text{Net Income Volatility}_{i,17} + b_{11} \text{Net PPE}_{i,17} + b_{12} \text{MB}_{i,17} + e \quad (1)$$

where the subscript 18 (17) denotes calendar year 2018 (2017). The dependent variable – $\text{Inv}_{i,t}$ – is the capital expenditure reported by firm i in 2018 scaled by total assets in 2017. The key explanatory variable, *TCJA_Effect* varies by model. It is mean or median change in EPS (*Mean EPS Change* or *Median EPS Change*) for the models that use the change in analyst forecasts and it is *Nonrecurring Tax, Remeasurement Gain, Remeasurement Loss, Repatriation Tax, and Net Remeasurement* for models that use direct measures of the impact of TCJA on financial statements.

To account for other factors that may influence investment decisions, following Hulse and Livingstong (2010) and Dobbins and Jacob (2016), we control for firm characteristics including size (*Log Total Assets*), earnings before interest and taxes over total assets (*EBIT*), a loss dummy (*Loss*), leverage (total liability to total assets - *Debt*), growth (sales over total assets - *Sales*), operating cash flows over total assets (*Operating Cash Flows*), dividends over total assets (*Dividends*), standard deviations of cash flows (*Cash Flow Volatility*) and net income (*Net Income Volatility*), and accumulated fixed assets in place (*Net PPE*). We also lag these variables to avoid endogeneity concerns. Due to redundancy concerns, we do not control for the market-to-

book ratio (*MB*) when using *Mean EPS Change* or *Median EPS Change*.¹² There is no control for *Net PPE* in models involving *Remeasurement Gain* either, because the depreciation of PPE determines both *Net PPE* and *Deferred Tax Liabilities*.

We show the descriptive data in Table 2. We winsorize all continuous variables at the top and bottom one percent of their distributions. Panel A shows that capital expenditure (*INV*) in 2018 is 5.4% of 2017 total assets, on average. *Mean EPS Change* (*Median EPS Change*) shows that on average analysts expected the TCJA to increase firms' earnings per share by 9.4% (6.4%) in 2018. Mean *Nonrecurring Tax* expenses of -0.018 indicates that the tax change results in an increase in tax expenses of 1.8% of an average firm's 2017 total assets. The means of *Remeasurement Gain*, *Remeasurement Loss* and *Net Remeasurement* are 0.010, 0.005, and 0.004 respectively, suggesting that firms obtain a gain (loss) of 1% (0.5%) of 2017 total assets when remeasuring their deferred tax liabilities (assets) and the net gain is 0.4%.

Panel B presents the correlation between variables of interest. Consistent with our expectation, *INV* is positively correlated with overall TCJA benefits as captured in the changes in analyst forecasts (*Mean EPS Change* and *Median EPS Change*), *Nonrecurring Tax* benefits, *Remeasurement Gain*, and *Net Remeasurement*. We conduct a test on variance inflation factors (VIF) and find that the highest VIF value is 6.98, much lower than the traditional threshold of 10.00 (Belsley et al., 1980). Therefore, multicollinearity is not a serious concern in our models.

3. Empirical Results

3.1 Main findings

¹² In an untabulated robustness test, we add *MB* as a control variable. The results are qualitatively the same.

Table 3 presents the cross-sectional test results for the full sample using the model with analyst forecasts. Columns 1 and 2 show that the coefficient estimates on *Mean EPS Change* and *Median EPS Change* are both 0.02 and statistically significant at the 1% level. Consistent with the prediction of stewardship theory, these results suggest that firms invested more in fixed assets in 2018 if the TCJA was expected to increase their earnings.¹³ These parameter estimates suggest that a \$1 increase in mean (median) EPS from the TCJA led to a \$17.31 (\$23.22) million increase in capital investment in 2018.¹⁴

We recognize that *EPS Change* is based on a third-party estimate, providing indirect evidence of the TCJA's impact. Therefore, we use *Nonrecurring Tax* to measure the direct impact of TCJA. Firms are required to disclose nonrecurring tax under accounting for income tax rule (ASC 740). *Nonrecurring Tax* reported in the fourth quarter of 2017 calendar year mainly reflects the remeasurement of *Deferred Tax Liabilities* and *Deferred Tax Assets* induced by the decrease in corporate tax rate, and the *Repatriation Tax* (Donelson et al. 2022).

We replace *EPS Change* with *Nonrecurring Tax* in model (1) and report the findings in Table 4. We have 1,569 observations after removing the requirement of financial analyst data. Our measure of *Nonrecurring Tax* uses the reported measure from Capital IQ multiplied by negative one and scaled by total assets, meaning benefits have a positive sign. Table 4 shows a statistically significant coefficient estimate on *Nonrecurring Tax* of 0.04, suggesting that companies receiving an additional \$1 million in Nonrecurring Tax benefits raised their capital expenditures by \$40,000 in 2018. The low values of economic impact of *Nonrecurring Tax* and

¹³ We also estimate our baseline model (Table 3) using the change in capital expenditures as the dependent variable. In addition, we include industry fixed effects. The findings are qualitatively similar.

¹⁴ We also calculate the aggregate investment effects. The TCJA motivated firms within our sample to increase their 2018 investments by a total of \$25.745 billion. We also estimate that all U.S. publicly listed firms increased capital investments by \$34.82 Billion due to the TCJA. This corresponds to approximately 3.3% of the total capital investment made by public firms during that year.

the adjusted R-square can be attributed to Nonrecurring Tax capturing a relatively smaller portion of the TCJA's impact on earnings. Furthermore, it may result from the offsetting effects between gains and losses related to the remeasurement of deferred tax liabilities and assets, as well as the absence of any impact from repatriation tax on investment, which will be presented in Table 5.

The larger sample size in the *Nonrecurring Tax* test allows us to test the impacts by industry. We replicate the *Nonrecurring Tax* test for each one-digit SIC code industry in Table 4. The coefficient estimates on *Nonrecurring Tax* are positive and statistically significant at the 10% level or lower for the following industries: Mining and Construction (industry #1), Transportation, Communications, Electric, Gas and Sanitary service (industry #4), and Wholesale and Retail Trade (industry #5), providing further evidence of a positive relationship between direct benefits from the TCJA and corporate investment in fixed assets. However, we find no evidence of higher *Nonrecurring Tax* leading to greater investments in Manufacturing, Services, or High Technology industries. The industry breakdown analysis indicates that the positive effect of the TCJA on capital expenditures is not driven by a specific industry.

Table 5 examines the effects of individual components of *Nonrecurring Tax*. The first column shows that the coefficient estimates on *Remeasurement Gain* and *Remeasurement Loss* are 0.37 and -0.50, respectively, and both are statistically significant at the one percent level. These results suggest that a \$1 million increase in remeasurement gains (losses) prompted firms to allocate an additional \$0.37 million (\$0.5 million less) toward capital expenditures in 2018. In column 2, the coefficient estimate for Net Remeasurement is 0.44, also statistically significant at the one percent level. This discovery provides evidence that a \$1 million increase in Net

Remeasurement resulting from the re-measurement of Deferred Tax Liabilities and Deferred Tax Assets stimulated \$0.44 million in additional capital expenditures in 2018.

The TCJA includes a one-time repatriation tax on all undistributed foreign earnings accumulated since 1986. Vuong (2019) found that U.S. multinational corporations (MNCs) increased foreign capital investment from 2012 to 2016, a pre-TCJA period, when those firms anticipated a switch to a territorial tax system. However, we find that the coefficient estimates on *Repatriation Tax* is insignificant in both columns, suggesting that it exerted no impact on investments in 2018. It is plausible that the benefits of the tax is offset by the burden on firms that do not repatriate the foreign earnings. The finding is also consistent with Beyer et al. (2023) who show that MNCs did not increase their domestic capital expenditures.

3.2 Additional Analysis

In this section, we examine two firm specific characteristics – the cost of capital and agency costs – that might moderate the effects of the TCJA. In addition, we conduct test of market response to firms' investment behavior.

3.2.1 Cost of Capital

Because the cost of capital is the major determinant of a firm's ability to raise external funds, firms with a greater cost of capital are more likely to underinvest compared to their peers with a lower cost of capital. The TCJA induced investment benefits may be smaller for firms with less capital constraints because the number of investment opportunities forgone due to financial constraints were likely lower before the TCJA. Even though the TCJA decreases the hurdle rate for investment for all firms (Dobbins and Jacob, 2016), the firms that suffer from higher cost of capital may achieve greater marginal impact on corporate investments. Thus, we

expect firms with a higher cost of capital in the pre-TCJA period to increase their post-TCJA investment more. We use weighted average cost of capital (WACC) to capture the cost of external financing, measured as:

$$\text{WACC} = \text{FVE}/\text{FV} * \text{Re} + \text{FVD}/\text{FV} * \text{Rd} * (1 - \text{Tc}) \quad (2)$$

where we obtain fair value of equity (FVE), fair value of debt (FVD), and the cost of debt (Rd) from Capital IQ database. We estimate cost of equity (Re) using Gebhardt et al. (2001) model and obtain long-term growth forecasts from the I/B/E/S database. FV is the sum of FVE and FVD. We use the statutory corporate tax rate (Tc) of 35% for the period before the TCJA.

We estimate WACC in 2017 (WACC17) and test for its main effect and its interaction with *EPS Change* in model (1) - shown in Columns 1 and 2 of Table 6. The coefficient estimates for WACC17 are 0.66 and 0.68 in the models without and with the interaction term, respectively. Both are significant at the one percent level, suggesting that firms with higher cost of capital in the pre-TCJA period invested more in 2018. The interaction between *EPS Change* and WACC17 is 0.72 and significant at the one percent level. This result indicates that the positive effect of EPS Change on investment is magnified for firms with a higher cost of capital. This suggests, as expected, that the tax benefits of TCJA had a larger effect on investment for firms that were previously more constrained by high capital costs.¹⁵

One potential issue is that WACC17 is prone to endogeneity. Our estimation of cost of equity, Re, uses the long-term growth forecasts made by financial analysts. These long-term growth forecasts may have been affected by expected investment changes spurred by the TCJA. We address this endogeneity issue by using 2016 WACC in Columns 3 and 4 of Table 6. Our

¹⁵ We also use alternative measures of financial constraints, such as leverage ratio and interest coverage ratio. The results show that the coefficient estimate on the interaction terms are significant and positive, suggesting that firms with greater financial constraints invested more in capital assets in 2018 as a result of the TCJA.

results show that the coefficient estimate on WACC16 is positive and significant at the 10% level when the interaction term is excluded (Column 3). The coefficient estimate on the interaction term between WACC16 and *EPS Change* is 0.36 and significant at the 10 percent level (Column 4).

3.2.2 Agency Issues

Next, we analyze the impact of agency problems on investment. Agency theory predicts that management may take opportunistic actions to achieve their own goals at the expense of shareowners' interests, avoiding profitable investment projects and boosting their compensation through tax savings. Myers (1977) coined the term “underinvestment” where managers under-invest in profitable projects even if they have potential to increase firm value. Coles et al. (2006) show that CEOs whose compensation is more sensitive to stock volatility (vega) adopt riskier policy choices, while those whose compensation is more sensitive to performance adopt less risky choices. Thus, executives with a higher vega are expected to invest more in risky assets, while those with higher delta are expected to invest more in less risky physical assets.

We control for the agency problem by using executive compensation data obtained from the ExecuComp database, using two measures, delta and vega (Coles et al., 2006).¹⁶ Delta is calculated as the dollar change in an executive's wealth for a one percent change in stock price. It is a measure of pay-performance sensitivity and captures the effort incentive of executives. Vega is the dollar change in an executive's wealth for a one percent change in standard deviation of returns and captures executives' risk incentive (Core and Guay, 2002; Coles et al., 2006). We use the mean of delta (vega) of all executives in each firm to capture the overall agency problem in

¹⁶ We are grateful for Dr. Naveen for providing the SAS code.

the firm. For the sake of easier interpretation, we use a dummy variable for delta and vega in the test. *Delta Dummy* (*Vega Dummy*) is set to one if the mean of an individual firm's delta (vega) is higher than the median of the sample – 72.98 for delta (3.47 for vega) – in 2017, and zero otherwise. We modify model (1) by adding in the dichotomous variables *Delta Dummy* and *Vega Dummy*, along with interaction terms with EPS change

The results reported in Table 7 show that, consistent with our primary findings, the coefficient estimate on *Mean EPS Change* is significant and positive at the one percent level, suggesting an overall positive impact of the TCJA on investment. The coefficient estimate for *Delta Dummy* is 0.01 and statistically significant at the 10% level. However, the coefficient estimate for *Vega Dummy* is not significant. Our finding of a positive association between delta and capital expenditures is consistent with Coles et al. (2006). This finding suggests that firms with a better alignment between the interests of managers and the shareholders increase their investments into fixed assets. The coefficient estimate on *EPS Change*DeltaDummy* (*EPS Change*VegaDummy*) is 0.04 (-0.03) and significant at the one percent level. The opposite interaction effects of Delta and Vega with the TCJA indicate that the passage of the TCJA stimulates investments in firms where managers' interests are aligned with those of investors and deters investments in firms with more risk-tolerant managers.

3.2.3 Market efficiency

Finally, the investment induced by the TCJA provides an opportunity to test market efficiency. Since capital expenditure takes time to bring benefits to the firm, the return on assets (*ROA*) ratio may temporarily decrease after the TCJA.¹⁷ If the market is efficient, investors

¹⁷ Firms do not disclose the exact time when they make investment in fixed assets throughout the year. Given that capital expenditure is a complex process, normally involving decision making, purchase, transportation, installation

should recognize the long-term positive effect of the investment and respond positively in 2018.

However, if the market is inefficient, firms that invested more might receive a penalty with lower returns.

We test the market response by using a recursive model. In the first stage, we estimate the portion of capital expenditure that could be explained by the overall TCJA benefits (*Expected Capital Expenditures*) using model (1). In the second stage, following Erkens et al. (2012), we test the association between *Expected Capital Expenditures* and market response in 2018 by using the model in Equation 3:

$$\text{Market Response}_{i,18} = a_0 + b_1 \text{Expected Capital Expenditures}_{i,18} + b_2 \text{LNTA}_{i,18} + b_3 \text{Debt}_{i,18} + b_4 \text{MB}_{i,18} + b_5 \text{BHR}_{i,17} + \text{Industry Fixed Effect} \quad (3)$$

where the subscript 18 (17) denotes calendar year 2018 (2017). Stock return data from the CRSP database are used to calculate buy-and-hold abnormal returns and market adjusted buy-and-hold abnormal returns as proxies for market response. We also control for size (*Log Total Assets*), leverage (Debt), market-to-book ratio (MB), and prior year (market adjusted) buy-and-hold abnormal returns.

Table 8 tests market efficiency. The results show that there is a positive association between *Expected Capital Expenditures* and buy-and-hold returns and market adjusted buy-and-hold returns in 2018, which supports market efficiency. The coefficient estimates on *Expected Capital Expenditures* are 1.69 (significant at the ten percent level in a one-tail test) in column 1 and 1.41 (significant at the ten percent level in a two-tail test) in column 2.

and test running, it is hard for us to estimate when the process is over. Therefore, we examine if 2018 capital expenditure induced by the tax change affected 2019 accounting return by using 2019 ROA as the dependent variable in model (3). The coefficient estimate on *Expected Capital Expenditures* is negative and significant at the one percent level. For the sake of simplicity, the result is untabulated. Due to the breakout of COVID-19, it is difficult to conduct an empirical analysis of the relations between *Expected Capital Expenditures* in 2018 and accounting returns in 2020.

Does the TCJA motivate management to continue investments beyond 2018? We address this question by replicating model (1) for *EPS Change* and *Nonrecurring Tax*, but using 2019 capital expenditure as the dependent variable. Table 9 shows that the coefficient estimates of *EPS Change* and *Nonrecurring Tax* are both -0.03 and significant at the 1% and 10% levels, respectively. These results suggest that the impact of TCJA is short lived or mean-reverting. However, we are cautious about this interpretation of the results and acknowledge that the TCJA may still have a long-term impact on capital expenditures, despite this temporary mean reversion.

3.3 Robustness tests

We conduct several tests to examine the robustness of our results. It is plausible that the increase in capital investment may have been a result of a general trend in the economy rather than the TCJA. To address this concern, we conduct a difference-in-differences (DID) analysis, using Canadian firms as a control group. Canadian firms have a similar economic and business structure to US firms, but were not directly affected by the TCJA. While they follow the International Financial Reporting Standards, which differ from U.S. Generally Accepted Accounting Principles in some aspects, the accounting treatment of capital expenditures is similar under both standards.¹⁸ Therefore, we believe Canadian firms are an appropriate control group for our analysis.

Table 10 compares capital expenditures of Canadian and U.S. firm before and after the TCJA. Panel A shows that, on average, Canadian firms decreased their investment from \$101.51 million in 2017 to \$98.65 million in 2018, while U.S. firms increased from \$255.26 million to

¹⁸ All major economies in the world, except the U.S., have adopted International Financial Reporting Standards.

\$263.68 million. The pattern is similar when capital expenditures are scaled by total assets in the previous year, with Canadian firms decreasing from 12.3% to 9.8%, and U.S. firms increasing from 5.9% to 6.2%.

In Panel B, we report the results of our DID regressions using model (4).

$$\text{Inv}_{i,t} = a_0 + b_1 * \text{TCJA}_{i,t} + b_2 * \text{Treat}_{i,t} + b_3 \text{TCJA}_{i,t} \times \text{Treat}_{i,t} + b_4 \text{Firm Fixed Effects} \quad (4)$$

where Inv is the dependent variable representing capital expenditures for firm i in year t.

We use a dummy variable, TCJA, to distinguish between the pre- and post-TCJA periods, with TCJA being 0 for 2017 and 1 for 2018. We set the treatment variable (Treat) to 1 for U.S. firms (treatment group) and 0 for Canadian firms (control group). In column (1), the coefficient estimate on TCJA x Treat is 0.0242 and statistically significant at the one percent level. In column (2), we include control variables from model (1) to the base model (4) and find that the coefficient estimate on TCJA x Treat is 0.0149, still significant at the one percent level. These results indicate that U.S. firms increased their capital expenditures significantly more than Canadian firms did after the passage of the TCJA.

We report the other robustness test results in online Tables OA2 and 3 for brevity. These tests focus on measuring impacts on *changes* in capital expenditures rather than levels, including additional firms and measuring the impacts of 100 percent bonus depreciation. Our findings for changes in capital expenditures and when adding additional firms support our other findings. We find that 100 percent bonus depreciation did not affect investment.

4. Conclusions

This paper investigates whether the Tax Cuts and Jobs Act (TCJA) of 2017 motivated firms to increase their capital investments. Our approach improves upon previous studies by measuring the specific tax benefits received by firms as a result of the TCJA and examining the

impact of those benefits on capital expenditures. We use earnings forecast changes (*EPS Change*) to measure the benefits and find a positive relation between *EPS Change* and capital expenditures in 2018, suggesting that greater TCJA benefits motivated firms to increase investment in fixed assets. Our estimate suggests that the TCJA stimulated additional capital investment by publicly listed U.S. firms of nearly \$35 billion. This finding contrasts those of previous studies that found disappointing results from the passage of the TCJA. We believe this highlights the need to explore the firm-specific effects of the tax change – something missing from prior studies. This finding also supports stewardship theory that managers use the additional resources available to maximize business profit.

An alternative measure of the impact of the TCJA on individual firms also shows a big impact on investment. We show that nonrecurring tax benefits, more specifically the remeasurement benefits boosted corporate investments in 2018. We also find that firms with higher pre-TCJA cost of capital and better executive pay-performance sensitivity increased their capital expenditure more in 2018.

Three important caveats must be considered when interpreting our results. First, we attempt to mitigate the effect of correlated measurement errors by narrowing the window in the measurement of *EPS Change* and including a comprehensive set of controls in our regression models. However, we cannot rule out the possibility of correlated measurement errors. Second, the tax changes in the TCJA are complex and extensive. Although we try to isolate the impact of individual tax benefits, other provisions might correlate with our measures and affect firms' investments decisions. Moreover, we are unable to assess the long-term impacts of TCJA on investment as a result of demand changes or the switch to a territorial tax system. Thus, our findings may underestimate the effect of the TCJA on capital investment.

Future research may develop new proxies for the impact of the other TCJA changes and investigate whether they promote investment in fixed assets since the passage of the act. Furthermore, it is desirable to investigate whether the TCJA stimulates other types of investment, such as mergers and acquisitions.

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Appendix A: Variable Definitions

This table provides definitions of the variables used in this study.

Variable	Definition
EPS Change	The percentage change in financial analysts' one-year ahead EPS forecasts around the passage of the Tax Cuts and Jobs ACT;
Mean EPS Change	Average of the percentage change in financial analysts' one-year ahead EPS forecasts;
Median EPS Change	Median of the percentage change in financial analysts' one-year ahead EPS forecasts;
Nonrecurring Tax	Nonrecurring tax expense (benefit) in quarter 4 divided by annual total assets in calendar year 2017 and multiplied by negative one;
Remeasurement Gain	2017 Deferred Tax Liability x 14% Tax Deduction/2017 Total Assets;
Remeasurement Loss	2017 Deferred Tax Assets x 14% Tax Deduction/2017 Total Assets;
Net Remeasurement	(Remeasurement Gain - Remeasurement Loss)/2017 Total Assets;
Repatriation Tax	Calculated by subtracting NRT from NetRem;
Investment	Capital expenditure in calendar year t divided by total assets in year t-1;
EBIT	Earnings before income tax divided by total assets in calendar year t-1;
Sales	Sales divided by total assets in calendar year t-1;
Debt	Total liabilities divided by total assets in calendar year t-1;
Loss	Set to one if a firm suffers a loss in calendar year t-1, and zero otherwise;
Log Total Assets	Log of total assets in calendar year t-1;
Operating Cash Flows	Operating cash flows divided by annual total assets in calendar year t-1;
Dividends	Dividends paid divided by annual total assets in calendar year t-1;
Cash Flow Volatility	Standard deviation of cash flows in the past five years;
Net Income Volatility	Standard deviation of net income in the past five years;
Net PPE	Net property, plant and equipment divided by annual total assets in calendar year t-1;
Market-to-Book Ratio	Market to book ratio in calendar year t-1;

Expected Capital Expenditures	Expected level of capital expenditures calculated using equation (1);
Change in Capital Expenditure	Calendar year t minus t-1 capital expenditure, then divided by year t-1 total assets.

Table 1: Sample Distribution by Industry

This table reports the industrial distribution of the sample used in the test of the Tax Cuts and Jobs Act's overall impact on capital expenditures in 2018. Source of industry classification: United States Department of Labor, https://www.osha.gov/pls/imis/sic_manual.html.

		Table 1: Sample Distribution by Industry	
SIC	Industry Name	# Obs.	Percent
0	Agriculture, Forestry and Fishing	3	0.19%
1	Mining and Construction	127	8.09%
2 & 3	Manufacturing	720	45.89%
4	Transportation, Communications, Electric, Gas and Sanitary service	179	11.41%
5	Wholesale and Retail Trade	184	11.73%
7&8	Services	348	22.18%
9	Public Administration	8	0.51%
Total		1,569	100.00%

Table 2: Summary Statistics for Investment Models

This table reports descriptive statistics (Panel A) and correlation matrix (Panel B) for the sample used in this study. All variables are defined in Appendix A.

Panel A: Descriptive Statistics

Variable	Mean	StdDev	Q1	Median	Q3
Investment	0.054	0.063	0.017	0.035	0.064
Mean EPS Change	0.094	0.423	0.006	0.072	0.155
Med EPS Change	0.064	0.263	0.005	0.071	0.151
Nonrecurring Tax	-0.018	0.094	-0.022	-0.001	0.015
Remeasurement Gain	0.010	0.014	0.000	0.004	0.015
Remeasurement Loss	0.005	0.014	0.000	0.000	0.006
Net Remeasurement	0.004	0.022	-0.004	0.002	0.014
EBIT	0.050	0.173	0.032	0.070	0.115
Sales	0.915	0.679	0.450	0.735	1.182
Debt	0.574	0.258	0.412	0.571	0.704
Loss	0.244	0.430	0.000	0.000	0.000
Log Total Assets	7.659	1.772	6.443	7.628	8.839
Operating Cash Flows	0.067	0.154	0.049	0.084	0.127
Dividends	0.013	0.020	0.000	0.000	0.018
Cash Flow Volatility	0.061	0.119	0.015	0.034	0.064
Net Income Volatility	0.061	0.140	0.016	0.030	0.056
Net PPE	0.255	0.247	0.064	0.161	0.378
MB	4.462	11.635	1.589	2.682	4.918

Panel B: Spearman Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Investment	1.00									
Mean EPS Change	0.12	1.00								
Med EPS Change	0.11	0.91	1.00							
Nonrecurring Tax	0.16	0.19	0.21	1.00						
Remeasurement Gain	0.17	0.03	0.05	0.66	1.00					
Remeasurement Loss	-0.07	-0.06	-0.06	-0.46	-0.43	1.00				
Net Remeasurement	0.13	0.05	0.06	0.68	0.89	-0.73	1.00			
EBIT	0.11	0.09	0.13	0.03	0.04	0.29	-0.10	1.00		
Sales	0.05	0.14	0.19	-0.03	-0.19	0.23	-0.25	0.41	1.00	
Debt	0.03	-0.01	0.00	0.10	0.12	-0.01	0.09	0.02	0.06	1.00
Loss	-0.12	-0.09	-0.12	-0.33	-0.29	-0.08	-0.17	-0.58	-0.19	-0.02
Log Total Assets	0.11	0.02	0.02	0.24	0.37	-0.01	0.27	0.19	-0.21	0.36
Operating Cash Flows	0.33	0.09	0.10	0.05	0.01	0.22	-0.10	0.70	0.28	-0.06
Dividends	0.09	0.01	0.02	0.09	0.20	0.08	0.12	0.43	0.10	0.13
Cash Flow Volatility	-0.16	-0.09	-0.09	-0.27	-0.30	0.10	-0.26	-0.08	-0.02	-0.24
Net Income Volatility	-0.03	-0.01	-0.03	-0.19	-0.25	0.09	-0.22	-0.18	-0.08	-0.14
Net PPE	0.74	0.05	0.05	0.20	0.24	-0.11	0.21	0.07	0.01	0.10
MB	-0.03	0.03	0.04	-0.21	-0.14	0.09	-0.14	0.33	0.08	0.03

Panel B continued

Variable	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Loss	1.00						
Log Total Assets	-0.34	1.00					
Operating Cash Flows	-0.39	0.10	1.00				
Dividends	-0.35	0.36	0.29	1.00			
Cash Flow Volatility	0.28	-0.31	-0.02	-0.24	1.00		
Net Income Volatility	0.40	-0.30	-0.05	-0.25	0.47	1.00	
Net PPE	-0.12	0.21	0.21	0.22	-0.29	-0.07	1.00
MB	-0.12	-0.03	0.31	0.12	0.13	-0.03	-0.18

Table 3: The overall impact of the TCJA on Capital Expenditures

This table reports the overall impact of the TCJA on capital expenditures in 2018 in model (1).

Dependent variable is Capital Expenditures in 2018. See Appendix A for variable definitions. We do not control for MB because both MB and Ch EPS convey the growth information, hence arousing endogeneity concerns. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Variables	(1)	(2)
Intercept	0.02*** (2.83)	0.02*** (2.82)
Mean EPS Change	0.02*** (4.91)	
Median EPS Change		0.02*** (3.31)
EBIT ₁₇	-0.07*** (-2.62)	-0.08*** (-2.82)
Sales	-0.00 (-0.86)	-0.00 (-0.99)
Debt	-0.01 (-0.98)	-0.01 (-0.92)
Loss	-0.00 (-0.52)	-0.00 (-0.19)
Log Total Assets	-0.00 (-1.57)	-0.00 (-1.56)
Operating Cash Flows	0.19*** (6.53)	0.19*** (6.71)
Dividends	-0.28*** (4.07)	-0.29*** (4.08)
Cash Flow Volatility	-0.01 (-0.41)	-0.01 (-0.74)
Net Income Volatility	0.05*** (4.12)	0.06*** (4.29)
Net PPE	0.13*** (21.63)	0.13*** (21.63)
N	1,329	1,329
Adj-R ²	0.41	0.40

Table 4: Effect of Nonrecurring Tax on Investment in 2018

This table reports the impact of nonrecurring tax expense on investment using model (1). Dependent variable is Capital Expenditures in 2018.

See Appendix A for variable definitions. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Variables	Industry						
	1	2&3	4	5	7&8	High Tech	
Intercept	0.02*** (3.27)	0.11 (1.57)	0.01 (1.02)	-0.01 (-0.31)	0.05** (2.44)	0.04* (1.69)	0.00 (0.48)
Nonrecurring Tax	0.04** (2.44)	0.14** (2.23)	-0.01 (-0.57)	0.29** (2.17)	0.23* (1.81)	0.03 (0.65)	0.02 (1.52)
EBIT	-0.08*** (-3.66)	0.23 (1.57)	-0.02 (-1.48)	-0.37*** (-3.87)	-0.00 (-0.04)	-0.11* (-1.71)	-0.03** (-2.07)
Sales	-0.00 (-0.66)	-0.04 (-1.56)	0.01*** (4.34)	0.01 (1.64)	-0.00 (-0.57)	-0.01 (-1.26)	0.01 (1.52)
Debt	0.00 (0.48)	-0.03 (-0.77)	-0.00 (-0.79)	-0.03 (-1.46)	-0.00 (-0.26)	0.01 (0.39)	-0.01*** (-2.69)
Loss	-0.00 (-1.25)	0.03 (1.50)	-0.00 (-1.06)	-0.00 (-0.16)	0.01 (1.10)	-0.01 (-0.78)	-0.00 (-0.37)
Log Total Assets	-0.00 (-1.26)	-0.01** (-2.35)	0.00 (0.80)	0.00 (0.39)	-0.00* (-1.69)	0.00 (0.12)	0.00* (1.91)
Operating Cash Flows	0.11*** (4.77)	0.15 (0.95)	0.03* (1.90)	0.60*** (6.47)	0.21*** (3.09)	0.16*** (2.72)	0.03* (1.73)
Dividends	-0.24*** (3.40)	-1.76*** (2.87)	-0.08 (1.45)	-0.12 (0.47)	-0.25 (1.43)	-0.31* (1.78)	-0.15** (1.99)
Cash Flow Volatility	-0.02 (-1.04)	0.64*** (3.51)	0.01 (0.52)	0.08 (1.23)	-0.01 (-0.18)	-0.05 (-1.27)	-0.01 (-0.70)
Net Income Volatility	0.04*** (3.05)	0.08 (1.64)	-0.01 (-0.91)	0.11 (1.07)	0.01 (0.10)	-0.04 (-0.81)	0.00 (0.15)
Net PPE	0.13*** (21.29)	0.15*** (3.34)	0.09*** (12.48)	0.10*** (6.66)	0.07*** (3.74)	0.07*** (3.82)	0.17*** (14.43)
MB	0.01* (1.71)	0.01** (2.30)	0.00 (0.91)	0.01*** (2.64)	0.00 (0.07)	0.00 (0.25)	0.01** (2.15)
N	1569	127	720	179	184	348	434
Adj-R ²	0.34	0.52	0.30	0.49	0.31	0.10	0.47

Table 5: Impact of Remeasurement Gain and Loss on Investment in 2018

This table reports the impact of remeasurement gains (losses) on investment using the research design discussed in section 2.2. Dependent variable is Capital Expenditures in 2018. See Appendix A for variable definitions. We do not control for Net PPE because depreciating PPE determines both Net PPE and Remeasurement Gain. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Variables	(1)	(2)
Intercept	0.03*** (4.05)	0.03*** (4.01)
Remeasurement Gain	0.37*** (2.93)	
Remeasurement Loss	-0.50*** (-4.02)	
Net Remeasurement		0.44*** (5.54)
Repatriation Tax	0.00 (0.86)	0.00 (0.97)
EBIT	-0.17*** (-6.28)	-0.17*** (-6.29)
Sales	-0.00 (-1.48)	-0.00 (-1.39)
Debt	0.00 (0.25)	0.00 (0.22)
Loss	-0.01 (-1.29)	-0.01 (-1.25)
Log Total Assets	0.00 (1.34)	0.00 (1.32)
Operating Cash Flows	0.29*** (10.90)	0.29*** (10.90)
Dividends	0.14* (1.91)	0.14* (1.91)
Cash Flow Volatility	-0.04*** (-2.82)	-0.04*** (-2.76)
Net Income Volatility	0.11*** (6.78)	0.11*** (6.75)
MB	-0.00 (-0.48)	-0.00 (-0.45)
N	1569	1569
Adj-R ²	0.12	0.12

Table 6: Impact of Weighted Average Cost of Capital on Investment

This table reports the impact of weighted average cost of capital on investment using model (1): Dependent variable is Capital Expenditures in 2018. See Appendix A for variable definitions. We do not control for MB because both MB and Ch EPS convey the growth information, hence arousing endogeneity concerns. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Variables	Using 2017 WACC		Using 2016 WACC	
	(1)	(2)	(3)	(4)
Intercept	0.01 (0.81)	0.01 (0.95)	0.00 (0.19)	0.00 (0.04)
Mean EPS Change	0.02*** (4.05)	0.01 (1.18)	0.02*** (5.00)	0.02*** (3.09)
WACC	0.66*** (4.61)	0.68*** (4.87)	0.27* (1.82)	0.14 (0.83)
WACC*Mean EPS Change		0.72*** (4.27)		0.36* (1.67)
EBIT	-0.12** (-2.53)	-0.12** (-2.56)	-0.12*** (-2.73)	-0.12*** (-2.71)
Sales	-0.00 (-0.17)	-0.00 (-0.02)	-0.00 (-0.06)	0.00 (0.03)
Debt	-0.02** (-2.19)	-0.02** (-2.30)	-0.01 (-0.63)	-0.00 (-0.53)
Loss	-0.01 (-1.47)	-0.01 (-1.57)	-0.00 (-0.57)	-0.00 (-0.66)
Log Total Assets	-0.00 (-0.37)	-0.00 (-0.56)	-0.00 (-0.06)	0.00 (0.13)
Operating Cash Flows	0.33*** (7.27)	0.32*** (7.32)	0.28*** (6.31)	0.28*** (6.30)
Dividends	-0.26** (2.48)	-0.24** (2.36)	-0.29*** (2.82)	-0.29*** (2.88)
Cash Flow Volatility	-0.01 (-0.15)	-0.01 (-0.26)	0.00 (0.05)	0.00 (0.04)
Net Income Volatility	0.10** (2.36)	0.11*** (2.61)	0.12*** (2.96)	0.12*** (3.15)
Net PPE	0.11*** (13.24)	0.11*** (13.75)	0.12*** (14.83)	0.12*** (14.88)
N	680	680	663	663
Adj-R ²	0.43	0.44	0.45	0.45

Table 7. Managerial Incentives and Investment

This table reports the impact of agency problem on investment. See Appendix A for variable definitions. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Intercept	0.02*
	(1.71)
Mean EPS Change	0.03***
	(4.30)
Delta Dummy	0.01*
	(1.76)
Vega Dummy	0.00
	(0.63)
<i>EPS Change*DeltaDummy</i>	0.04***
	(2.89)
<i>EPS Change*VegaDummy</i>	-0.03***
	(-2.80)
EBIT	-0.03
	(-0.82)
Sales	0.00
	(0.22)
Debt	-0.01
	(-1.13)
Loss	0.00
	(0.35)
Log Total Assets	-0.00**
	(-2.55)
Operating Cash Flows	0.17***
	(4.62)
Dividends	-0.35***
	(-4.14)
Cash Flow Volatility	0.03
	(1.07)
Net Income Volatility	0.10***
	(2.89)
Net PPE	0.15***
	(21.77)
MB	0.00
	(0.74)
N	904
Adj-R ²	0.53

Table 8: Market Response to Investment Induced by the Tax Cuts and Jobs Act

This table reports the market response to the investment induced by the TCJA using model (3). BHR is buy-and-hold return, and BHAR stands for market adjusted BHR. See Appendix A for the definitions of other variables. # denotes significant at the ten level in a one-tail test. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Variables	Dependent Variable		
	Buy-and-hold Returns in 2018	Market adjusted Buy-and-hold Returns in 2018	
Intercept	-0.24 (-1.54)	-0.60*** (-5.62)	
Expected Capital Expenditures	1.69# (1.57)	1.41* (1.95)	
Log Total Assets	0.01 (1.33)	0.02*** (4.98)	
Debt	-0.03*** (-10.3)	-0.02*** (-10.0)	
MB	0.03*** (14.75)	0.02*** (14.29)	
BHR	-0.04** (-2.22)		
BHAR		-0.01 (-0.54)	
Industry Effect	Yes	Yes	
N	1,329	1,329	
Adj-R ²	0.20	0.20	

Table 9: Impact of the overall TCJA effect and Nonrecurring tax expenses on Investment in 2019

This table reports the overall impact of the TCJA on investment in 2019 in model (1). Dependent Variable is Capital Expenditures in 2019. See Appendix A for variable definitions. *, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). # denotes significant at the ten level in a one-tail test. T-statistics are reported in brackets.

Variables	Estimate	Estimate
Intercept	-0.03** (-2.50)	-0.03*** (-4.13)
Mean EPS Change	-0.03*** (-2.85)	
Nonrecurring Tax		-0.03* (-1.76)
EBIT	0.05 (1.22)	0.09*** (4.34)
Sales	0.00 (1.00)	-0.00 (-0.70)
Debt	0.01 (1.23)	-0.00 (-0.30)
Loss	-0.00 (-0.25)	0.01** (2.20)
Log Total Assets	0.00 (1.35)	0.00* (1.92)
Operating Cash Flows	-0.16*** (-4.16)	-0.11*** (-4.98)
Dividends	0.18* (-1.80)	0.14** (-2.07)
Cash Flow Volatility	-0.00 (-0.01)	0.01 (0.70)
Net Income Volatility	-0.03 (-0.88)	-0.02 (-1.52)
Net PPE	-0.13*** (-15.3)	-0.12*** (-20.2)
MB	-0.00 (-1.06)	-0.00** (-2.36)
N	723	1463
Adj-R ²	0.38	0.32

Table 10: A Difference-in-Differences Analysis of the Impact of the overall TCJA Effect on Investment

This table presents the overall impact of the TCJA on investment, comparing the difference in investment between US and Canadian firms before and after the passage of TCJA. Panel A shows the average capital expenditure made by U.S. and Canadian firms in the pre- and post-TCJA period. Panel B presents regression results of the difference-in-differences analysis using model (4). Dependent Variable is Capital Expenditures in 2019. The variable TCJA is set to 1 for the year 2018 and 0 for 2017. Treat is set to 1 for US firms and 0 for Canadian firms. Column (2) includes control variables adopted from Model (1).

*, **, *** indicate significance at the ten percent, five percent, and one percent levels (two-tailed). T-statistics are reported in brackets.

Panel A: Mean of Capital Expenditure Made by US and Canadian Firms Before and After the TCJA

Sample	Period	# of Obs	Capital Expenditure (Unscaled)	Capital Expenditure/Total Assets t-1
Canadian Firms	Before	1386	101.51	0.123
	After	1514	98.65	0.098
US Firms	Before	3810	255.26	0.059
	After	4131	263.68	0.062

Panel B: Difference-in-Differences Test

	(1)	(2)
TCJA	0.0003 (0.100)	-0.0012 (-0.34)
Treat	0.0375 *** (6.07)	0.0001 (0.01)
TCJA*Treat	0.0242 *** (3.62)	0.0149 ** (2.26)
Constant	0.0616 *** (19.26)	0.0775 *** (9.43)
Controls		Yes
Fixed Firm Effect	Yes	Yes
# of Observations	10,841	10,841