

# How U.S. Firms Adjusted Capital Structure after the Tax Cuts and Jobs Act: Empirical Evidence

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## Abstract

**Purpose:** This paper investigates how a firm responds to tax reforms on corporate capital structure decisions. The TCJA 2017 represents one of the most significant tax reforms in the U.S. history, reducing the corporate income tax rate from 35 per cent to 21 per cent while introducing some major provisions, such as bonus depreciation, interest deductibility limits, and restrictions on NOL carryforward, which could have a joint effect on corporate capital structure decisions. Based on traditional capital structure theories, we hypothesized that such a significant tax rate reduction, including the addition of some restrictive provisions, would motivate companies to rely less on debt financing relative to internal financing or equity financing due to decreased tax shield benefits.

**Methodology:** To test our hypotheses, we employ a panel regression model with firm and year-fixed effects. Our sample consists of 42,598 firm-year observations spanning from 2014 to 2020. We utilize multiple proxy measures for capital structure decisions, including short-term debt ratio, long-term debt ratio, and total leverage. We control for firm-specific factors that might influence capital structure choices. We conduct additional analyses based on firms' financial distress levels (using Altman's Z-score) and financial flexibility, measured by cash holdings.

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**Findings:** Contrary to expectations derived from static trade-off theory, we find that firms' dependence on external sources financing increases in post-reform periods relative to pre-reform periods. The positive relation between tax reform and short-term financing is more pronounced in financially distressed firms, while safer firms tend to decrease their reliance on short-term financing in the post-reform periods. In contrast, firms with greater financial flexibility exhibit greater reliance on long-term debt in post-reform periods than less financially flexible firms.

**Originality/Value:** This study provides the first comprehensive empirical investigation of TCJA 2017's impact on corporate capital structure decisions. Our findings contribute to the capital structure literature by providing evidence consistent with dynamic trade-off theory rather than static trade-off models. The results have important implications for policymakers evaluating the effectiveness of tax reforms in influencing corporate financial behavior and for corporate financial managers making capital structure decisions in changing tax environments.

**Keywords:** Tax reform, capital structure, short-term debt, long-term debt, financial flexibility, dynamic trade-off theory

**JEL codes:** M41, M48

## 1. Introduction

Capital structure decisions involve significant uncertainty and directly affect firm valuation and capital dynamics. Despite the considerable attention devoted to understanding how tax changes influence corporate financing decisions, the empirical evidence remains mixed, leading to what Myers (1984) called the "capital structure puzzle." Several theoretical frameworks offer competing explanations for capital structure choices. The "static trade-off" theory holds that firms determine optimal capital structure by balancing the tax benefits of debt with the potential bankruptcy costs (Myers, 1984). The "dynamic trade-off" theory further extends this logic, suggesting that firms gradually adjust their leverage position based on factors like how far they are from their target capital structure level, their profitability or cost of adjustment, and when policy shocks change their tax incentives (Fischer *et al.*, 1989; Heider & Ljungqvist, 2015).

This paper investigates the impact of the Tax Cuts and Jobs Act of 2017 (TCJA) on capital structure choices in the USA. TCJA was enacted on December 22, 2017, which is a significant tax reform in the USA since the Tax Reform Act of 1986. The TCJA introduced numerous changes to individual and business taxes, as well as to foreign income taxation. A prominent reform within the TCJA is the reduction of the corporate tax rate from 35% to a flat 21%, which represents a remarkable, historically large reduction in corporate taxation in the USA. Additionally, TCJA implemented restrictions on interest expense deductibility,

required amortization of research and development expenditure (R&D), and imposed limitations on territorial taxes, among other provisions. The Joint Committee on Taxation (JCT) projected that this tax reform would decrease total corporate tax revenue by \$1.414 trillion over the next 10-year budget window (2017-2027). Simultaneously, the JCT estimated that gross domestic product (GDP) would increase by 0.8 per cent over the same period.

After the enactment of TCJA, many researchers attempted to explore its impact. Till date, prior research investigates the impact of TCJA on household income of U.S. citizens and cost of living (e.g., Ambrose *et al.*, 2022; Bawa & Williamson, 2020; Beebe, 2019; Coen-Pirani & Sieg, 2019); firms executive compensation expenses (Balsam *et al.*, 2019; De Simone *et al.*, 2019; Durrant *et al.*, 2021; Luna *et al.*, 2023); performance-based payments (De Simone *et al.*, 2022); stock market returns (e.g., Kalcheva *et al.*, 2020; Matheson *et al.*, 2022; Wagner *et al.*, 2018); firms behavioral responses in capital structure (e.g., Carrizosa *et al.*, 2022; Yu *et al.*, 2023). Despite the extensive literature on capital structure determinants, a significant research gap exists regarding TCJA's impact on corporate financing decisions. The dramatic reduction in corporate tax rates, restrictions on deductibility of interest expenses and NOL carryforwards, and allowance of 100% bonus depreciation present an ideal setting to test competing capital structure theories and examine how firms adjust their financing strategies in response to major tax policy changes. Our study addresses this gap by investigating whether and to what extent the TCJA affects the capital structure decisions of US public companies.

Therefore, the primary objective of this study is to examine how corporate tax reforms influence firms' leverage decisions. A significant tax rate reduction or limits on interest deductibility could decrease the tax benefits of debt, potentially leading firms to reduce their leverage ratios. However, the dynamic trade-off theory suggests an asymmetric relationship between tax benefits of debt and leverage, where firms might not necessarily reduce debt levels following a decrease in tax or tax benefits, but might increase debt following an increase in tax or tax benefits. Immediate allowance of 100% bonus depreciation could reduce the attractiveness of debt financing, while restrictions on NOL carryforwards, up to 80% of taxable income, could marginally restore it. By investigating these contrasting predictions, our study contributes to the ongoing debate on the relationship between corporate taxation and capital structure decisions.

This study makes several important contributions to the literature. First, we provide early empirical evidence on how the TCJA affects capital structure choices of US firms, helping to understand corporate responses to a major tax policy change. Second, we disentangle the heterogeneous impacts of tax reduction and modifications to other significant provisions across firms with different financial

health profiles, offering insights into how financial constraints moderate tax policy effects. Third, our results have implications for policymakers, regulators, and researchers regarding the efficacy and consequences of TCJA. While one of the important goals of TCJA was to reduce corporate tax burden and potentially decrease reliance on external funding, our research examines whether this policy objective has been achieved in practice.

The remainder of the paper is organized as follows. Section 2 presents a literature review and develops our hypotheses. Section 3 discusses our research design and empirical methodology. Section 4 presents the main results and their interpretation. Section 5 provides additional sensitivity analyses, and Section 6 concludes with implications and directions for future research.

## 2. Related Research and Hypotheses Development

### 2.1 TCJA and capital structure

To assess the possible consequences of TCJA on the spatial distribution of households in the USA, Coen-Pirani and Sieg (2019) conducted a quantitative test and they find that TCJA has motivated older, high-productivity households to move to low-cost cities in the USA. They document that the tax reform has significantly increased the tax burden of productive households.<sup>2</sup> This happens due to the capping of state and local tax deductions under the TCJA.

It is argued that the tax deduction advantage may increase firm operating expenses in a particular period, which is not within the trap of earnings manipulations. For instance, Gaertner *et al.* (2020) investigated whether firms charge higher pension contributions as expenses to get the benefits of corporate tax reduction by the TCJA 2017. By analyzing 387 unique U.S firms from the period of 2014 to 2017, they find that firms have increased pension contributions significantly in 2017 compared to pre-TCJA periods to get tax incentives. The likelihood of charging unexpected pension contributions is highly pronounced in tax-paying firms compared to nontax-paying firms, which is consistent with the notion of TCJA 2017. Taking a similar context, Durrant *et al.* (2021) predicted that firms utilize such significant tax reduction by charging corporate staff expenses to get tax-deductible benefits, particularly in the tax reform period. Consistently, they document that firms charge significantly higher executive compensation expenses in 2017 than in pre-reform periods. Next, they disentangle the total impact of TCJA on CEO compensation and CFO compensation, and they find that the positive

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<sup>2</sup> Coen-Pirani and Sieg (2019) shows that people with income greater than \$500,000 will pay 3% higher tax in expensive cities (like California) than people live in other low-cost cities (such as, Texas).

impact is highly pronounced for CEO compensation compared to CFO's compensation. In sum, authors infer that firms get additional incentives to charge excessive operating expenses to realize the benefits of TCJA. De Simone *et al.* (2022) tested whether TCJA has motivated firms to pay more performance and executive salaries to get tax-deductible benefits. This is because TCJA has limited executive compensation to around \$1million of total compensation paid to top-level management of the firm. After empirical analysis, they do not find any impact of TCJA on salary, performance pay, and other total compensation mix, which is contradictory with the aim of Congress.

Recently, Luna *et al.* (2023) examined the impact of TCJA on CEO compensation in U.S. firms. They conjectured that TCJA could have increased CEO compensation as firms would have a tax advantage. But they do not find any incremental or moderating role of corporate governance in the relation between tax reform and CEO compensation, while they observe a small impact when the CEO has influence over the board of directors or compensation committee members.

While many international companies are operating in the U.S. market, it is likely that international firms will be disproportionately charged compared to local firms because of tax reform. For instance, Kalcheva *et al.* (2020) examine the impact of TCJA on the stock market responses. By analyzing U.S. publicly listed companies, they document that highly taxed firms greatly benefit from TCJA compared to their low-tax-paying counterparts. However, internationally operating firms are at a significant disadvantage, and firms with higher interest expenses are also negatively affected. Moreover, they show that TCJA has negatively affected growing, financially constrained firms relative to firms without financial constraints in the same setting.

In addition, it is argued that U.S. firms pay less tax after TCJA than their competitors, and that, moreover, such tax reform will reduce U.S. national income. Hence, it is possible that foreign firms will be disproportionately affected by TCJA. Taking this context Gaertner *et al.* (2020) investigated the impact of TCJA in 38 countries (excluding the USA), and they find that TCJA has substantial heterogeneity around the world. Such heterogeneity varies from firm to firm and from country to country. More specifically, they find that TCJA, results in positive stock market returns in 33 out of 38 countries and negative returns in the other five. Notably, the negative impact of TCJA was more pronounced in among Chinese firms than in other regions. A plausible reason for such heterogeneity is that compared to Chinese firms, U.S. firms are better positioned to compete with such tax reform.

It is plausible that different industries have different exposure to TCJA as they are subject to different tax rates, minimum tax rate ceilings, rules of law, regulations,

and varied enforcement, which is industry-specific. Taking this tension, Bar (2020) explored the possible impact of TCJA in six industries in the U.S. Utilizing tax payment data from 2006 to 2018, they document that, in terms of tax savings, the utilities sector is highly benefited, the construction and manufacturing sectors are the least benefited from TCJA.

Carrizosa *et al.* (2022) attempt to investigate the behavioral responses of tax reform on capital structure. Notably, they focus on TCJA 163 (j) regarding interest limitations and how this provision affects firms' capital structures. By taking a sample of two groups (affected and unaffected firms), they suggest that, compared to unaffected firms, affected firms increase their debt by 7% of their total assets. But they limit their analysis to the interest expense cap, which is based on the adjustable taxable income. Although the present study is of similar nature, Carrizosa *et al.* (2022) did not separate the impact based on the nature of the firms (e.g., firms in distress, safer, and grey), which is considered in our study. Moreover, we extended our analysis to cover the financial flexibility impact on capital structure decisions, because prior studies show that financial flexibility is significantly associated with firms' capital structure decisions (Harris, 2015; Lambrinoudakis *et al.*, 2019; Pendar *et al.*, 2019). In addition, figure 1 shows our theoretical framework for the present paper.

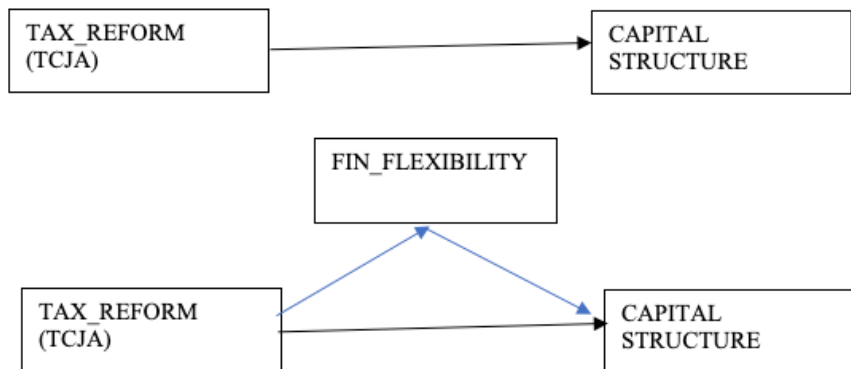


Figure 1. Theoretical framework of the paper

Taking all of the above research, we formulate the following hypothesis to estimate the impact of TCJA on the capital structure of U.S. firms.

*H<sub>1</sub>: The Tax Cuts and Jobs Act has affected capital structure choices of U.S. firms.*

## 2.2 TCJA, financial flexibility and capital structure

Financial flexibility provides firms with future investment opportunities and at the same time protects firms from the possibility of future failure (Denis & McKeon,

2012; Lambrinouidakis *et al.*, 2019; Salehi & Moghadam, 2019). Prior research documents anecdotal and empirical results related to financial flexibility and capital structure and provides mixed results (Chod & Zhou, 2014; Denis & McKeon, 2012; Graham & Harvey, 2001; Lambrinouidakis *et al.*, 2019; Pendar *et al.*, 2019; Reinartz & Schmid, 2016; Singh & Hodder, 2000). However, none of the prior research focuses on the impact of tax reform on financial flexibility and firms' capital structure, which are specifically explored in this paper. We believe financial flexibility will make firms less dependent on external debt, but tax reform (e.g., TCJA) will moderate this relation.

For instance, Singh and Hodder (2000) argue and find that financial flexibility is one of the key determinants of the firms' capital structure. More importantly, they document that financial flexibility provides multinational organizations with synergistic benefits over single-country organization. However, they infer that the magnitude of optimal capital structure depends on the firm's jurisdiction and the volume of operations measured by subsidiaries. Capital structure choices vary from firm to firm, and they depend on the size of the firm. For instance, a pioneer study by Graham and Harvey (2001) documents that compared to large firms, small firms are less sensitive in terms of capital structure. They identified a gap between the real corporate capital structure that firms face and the capital structure taught in the class. They find that either academics love teaching cost of capital and capital budgeting, or corporate executives do not follow theoretical formulas when mapping their capital structure. However, Graham and Harvey (2001) infer that financial flexibility is one of the influential determinants of capital structure. In a similar vein, Denis and McKeon (2012) provide empirical evidence that firms issue long-run debt to meet future operating capital needs. However, firms reduce their long-term debt when they have sufficient financial flexibility, as measured by operating cash flow and investment opportunities. Finally, they align unused debt capacity as a significant part of financial flexibility, which affects firms' capital structure.

On the other hand, resource flexibility mitigates agency conflict between debtholders and shareholders by reducing the possibility of costly default. Chod and Zhou (2014) examine and find that higher leverage leads to underinvestment and truncated flexibility. More specifically, they suggest that fund providers offer favorable credit terms for firms with higher flexibility compared to firms with limited flexibility. Similarly, Reinartz and Schmid (2016) examine the effect of volume flexibility in the utilities sector on financial leverage. They find that financial leverage is positively associated with production flexibility, but only in the utilities sector, due lower financial distress and a higher present value of tax benefits. In sum, financial flexibility is needed to meet future unexpected financial needs. Firms with higher flexibility will depend less on external debt compared to

firms with less flexibility. Based on the above studies, the following two hypotheses are estimated:

*H<sub>2</sub>: The relation between TCJA 2017 and capital structure is moderated by financial flexibility.*

*H<sub>3</sub>: The relation between TCJA and capital structure is affected due to firm's nature.*

### 3. Methodology

#### 3.1 Sample Selection

Table 1 presents our sample selection process. We collect all firm fundamentals from COMPUSTAT database. Financial (SIC 6000-6999) and utilities firms (SIC 4000-4999) are excluded from our sample because they are subject to different rules and regulations. Moreover, utilities and financial firms are excluded from all prior accounting and finance research based on the same grounds (Kalcheva *et al.*, 2020). We start with all companies available in COMPUSTAT from the period of 2014 to 2020. Firms without sufficient control variables (4356) and firms with duplicate keywords (GVKEY) are also excluded from the sample, which gives us a total of 42598 firm-year observations. We conduct all of our multivariate analyses based on 42598 firm-year observations.

**Table 1. Sample selection process**

Particulars	Observations
Initial sample from 2014 to 2020	80,276
Less: Duplicates of GVKEY and firm year (FYEAR)	5,689
Less: financial institutions (Sic 6000-6999)	22,325
Less: Utility firms (Sic 4900-4999)	5,308
Less: firms with missing variables	4,356
<b>Final sample for regression analysis</b>	<b>42,598</b>

#### 3.2 Research Design

The following ordinary least square (OLS) regression model is estimated to test our conjecture on the impact of TCJA on firms' capital structure.

$$CAPS_{i,t} = \beta_0 + \beta_1 TCJA_{i,t} + \beta_2 Lag\_CAPS_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 INTANG_{i,t} + \beta_6 CAPEX_{i,t} + \beta_7 RND_{i,t} + \beta_8 NWC_{i,t} + \beta_9 DIVIDEND_{i,t} + \beta_{10} CFO_{i,t} + \Sigma Year_t + \Sigma Industry_{i,t} + \varepsilon_{i,t} \dots (1)$$

$$CAPS_{i,t} = \beta_0 + \beta_1 TCJA_{i,t} + \beta_2 Lag\_CAPS_{i,t} + \beta_3 TCJA_{i,t} \times FINFLEX_{i,t} + \beta_4 FINFELX_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 INTANG_{i,t} + \beta_8 CAPEX_{i,t} + \beta_9 RND_{i,t} + \beta_{10} NWC_{i,t} + \beta_{11} DIVIDEND_{i,t} + \beta_{12} CFO_{i,t} + \Sigma Year_t + \Sigma Industry_{i,t} + \varepsilon_{i,t} \dots (2)$$

where CAPS denotes types of capital structure. We use three proxy measures of capital structure choices. Definitions of all variables are provided in the following three sub-sections: 3.2.1, 3.2.2 and 3.2.3.

The models will be tested based on the fixed effects estimator. Breusch-Pagan Lagrange Multiplier test suggests the suitability of random effects over pooled OLS with a p value of less than 0.05, while the ANOVA F test supports the use of fixed effects model. Hausman test has been conducted to support our decision to use fixed effects over random effects as the result yielded a p-value of less than 0.05. The panel nature of dataset, might introduce unobserved heterogeneity due to which year fixed effect has also been included. The models will be estimated with cluster standard errors to ensure robustness while accounting for within-group serial correlation.

The coefficients that will be estimated from these models would provide evidence of firms' adjustment behavior based on the dynamic trade-off perspective. The idea is that factors like cost of adjustment, profitability, and market condition prevent immediate readjustment.

### ***3.2.1 Dependent Variable***

To test our hypothesis, we use three different measures of capital structure, including total debt to total assets (TDTA), long-term debt to total assets (LTDTA) and short-term debt to total assets (STDTA), following prior research (Titman & Wessels, 1988; Zeitun & Tian, 2014).

### ***3.2.2 Independent Variables***

Our main variable of interest is tax reform, i.e., TCJA. TCJA covers the impact of Tax Cuts and Jobs Act of 2017 on capital structure. We assign 1 for the period of 2017 and on words and 0 for the pre-periods of tax reform. A one-year lag of the dependent variable (capital structure) has been included to measure persistence in capital structure and firms' gradual adjustment towards target leverage.

### ***3.2.3 Moderation Effect***

Firms' financial flexibility, as measured by cash holdings, has been introduced into the model as a moderating variable. This study examines how financial flexibility moderates the relationship between TCJA and capital structure decisions.

### ***3.2.4 Control variables***

Prior literature identifies a set of firm-level characteristics that explains the impact of TCJA on firms' capital structure. For example, we control firm size (SIZE), which is measured as the logarithm of market value. We expect larger firms to be less affected by this new act than smaller firms. This is because larger firms are highly resilient, and they can cope with the changes in a better way than smaller firms. Hence, the coefficient of firm size will be negative for capital structure. We also control the firm's profitability. We conjecture that loss-making firms will be more severely affected than profitable firms. In other words, profitable firms will

be less likely to depend on external debt compared to loss-making firms. Hence, we expect the coefficient of the firm's profitability (ROA) to be negative. We control firms' investment in capital expenditure (CAPEX) because we assume firms with larger capital expenditure will have an impact on firms' capital structure. Next, we control for firms' research and development expenditure (RND) investment. Firms with greater investment in research and development will have a positive impact on firms' capital structure. This is because regulation allows research expenditure to be recorded as an expense, and development expenditure will be capitalized in a particular year. Hence, such disentangling research and development expenditure will have a definite impact on the proportion of external debt to total assets of the sample firms. We also expect net working capital to be related to capital structure. This is because firms with greater short-term debt will require more working capital to repay their obligations. Dividends are expected to be negatively associated with debt structure, as firms with greater equity proportions will have less dependence on external funding. Moreover, highly leveraged firms will pay less dividends than their counter firms, unlevered firms or equity-based firms. We expect a negative coefficient for the dividend dummy variable. Cash flow level (CFO) is expected to be positively associated with firms' capital structure, as firms with higher liquidity will get privilege in getting external funding from financial intermediaries.

## 4. Empirical Results

### 4.1 Descriptive Statistics

Table 2 presents descriptive statistics for the variables used in our paper. Panel A displays descriptive statistics for the full sample, and Panel B shows the descriptive statistics for distress firms, and Panel C shows the descriptive statistics for grey firms, and Panel D shows the same for safe firms.

Panel A shows that the mean value of TDTA is 0.448, which suggests that more than 40 per cent of the capital structure consists of total debt to total assets of the sample company. We also find, when we proportionate total debt to total equity, the mean value of TDTE is 0.398, which indicates that more than 39 per cent total debt is in proportion to total equity of the firm. The mean value of long-term debt to total assets (LTDTA) is 0.18, which shows that, on average, 18 per cent of total assets comes from long-term debt, and the proportion of short-term debt (STDTA) is 0.225. In sum, we can infer that the proportion of short-term debt to total assets is greater than the proportion of long-term debt to total assets. The mean value of the Tax Cuts and Jobs Act (TCJA) is 0.555, which shows the symmetric distribution of our sample before and after of the TCJA Act Enactment. The mean value (median) of firm size (SIZE) is 4.649 (4.729), and the mean value of the firm's profitability (ROA) is -0.886. The details of all variables are given in Panel A.

Table 2. Panel A: Descriptive Statistics (Full Sample)

Variable	N	Mean	Median	S.D.	P25	P75	P90	Min	Max
<i>TDTA</i>	42598	0.448	0.166	1.211	0.000	0.392	0.707	0.000	8.405
<i>TDTE</i>	42598	0.398	0.095	2.045	0.000	0.664	1.689	-7.932	9.878
<i>LTDIA</i>	42598	0.180	0.063	0.258	0.000	0.284	0.496	0.000	1.311
<i>STDTA</i>	42598	0.225	0.008	0.967	0.000	0.052	0.240	0.000	6.867
<i>TDTC</i>	42598	0.399	0.076	2.104	0.000	0.660	1.730	-8.208	10.294
<i>TCJA</i>	42598	0.555	1.000	0.497	0.000	1.000	1.000	0.000	1.000
<i>SIZE</i>	42598	4.649	4.729	3.229	2.148	7.137	8.853	-8.668	14.492
<i>ROA</i>	42598	-0.886	-0.026	3.883	-0.334	0.054	0.124	-31.529	0.425
<i>INTANG</i>	42598	0.148	0.021	0.215	0.000	0.239	0.502	0.000	0.805
<i>CAPEX</i>	42598	132.580	3.090	466.818	0.090	42.430	243.523	0.000	3464.700
<i>RND</i>	42598	0.109	0.000	0.299	0.000	0.075	0.292	0.000	2.136
<i>NWC</i>	42598	-1.048	-0.016	5.933	-0.136	0.062	0.189	-50.286	0.468
<i>DIVIDEND</i>	42598	0.253	0.000	0.435	0.000	1.000	1.000	0.000	1.000
<i>CFO</i>	42598	-0.918	-0.033	4.047	-0.329	0.026	0.074	-33.765	0.332
<i>FIRMTYPE</i>	42598	1.810	1.000	0.926	1.000	3.000	3.000	1.000	3.000
<b>Panel B: Distress Firms</b>									
<i>TDTA</i>	23084	0.649	0.157	1.602	0.000	0.525	1.143	0.000	8.405
<i>TDTE</i>	23084	0.299	0.000	2.333	0.000	0.575	2.023	-7.932	9.878
<i>LTDIA</i>	23084	0.191	0.000	0.309	0.000	0.313	0.605	0.000	1.311
<i>STDTA</i>	23084	0.380	0.001	1.288	0.000	0.085	0.579	0.000	6.867
<i>TDTC</i>	23084	0.290	0.000	2.387	0.000	0.521	2.063	-8.208	10.294
<i>TCJA</i>	23084	0.538	1.000	0.499	0.000	1.000	1.000	0.000	1.000
<i>SIZE</i>	23084	3.007	2.819	2.778	0.000	5.059	6.929	-8.668	12.070
<i>ROA</i>	23084	-1.562	-0.155	5.112	-0.691	0.000	0.041	-31.529	0.425
<i>INTANG</i>	23084	0.109	0.000	0.207	0.000	0.105	0.457	0.000	0.805
<i>CAPEX</i>	23084	74.650	0.443	348.990	0.001	8.715	89.344	0.000	3464.700
<i>RND</i>	23084	0.153	0.000	0.378	0.000	0.120	0.431	0.000	2.136
<i>NWC</i>	23084	-1.937	-0.048	7.941	-0.279	0.000	0.095	-50.286	0.468
<i>DIVIDEND</i>	23084	0.113	0.000	0.317	0.000	0.000	1.000	0.000	1.000
<i>CFO</i>	23084	-1.593	-0.151	5.340	-0.677	0.000	0.023	-33.765	0.332

<b>Panel C: Grey Firms</b>												
<i>TDTA</i>	4523	0.308	0.301	0.249	0.162	0.426	0.548	0.000	4.948			
<i>TDTE</i>	4523	0.876	0.643	2.124	0.208	1.229	2.272	-7.932	9.878			
<i>LTDTA</i>	4523	0.255	0.245	0.210	0.078	0.381	0.502	0.000	1.311			
<i>STDTA</i>	4523	0.050	0.016	0.113	0.001	0.056	0.138	0.000	4.948			
<i>TDTC</i>	4523	0.921	0.669	2.230	0.207	1.286	2.387	-8.208	10.294			
<i>TCJA</i>	4523	0.548	1.000	0.498	0.000	1.000	1.000	0.000	1.000			
<i>SIZE</i>	4523	6.338	6.679	2.743	4.758	8.209	9.566	-0.672	12.585			
<i>ROA</i>	4523	0.017	0.039	0.192	-0.007	0.076	0.149	-3.714	0.425			
<i>INTANG</i>	4523	0.214	0.127	0.228	0.015	0.371	0.571	0.000	0.805			
<i>CAPEX</i>	4523	285.210	32.139	703.202	5.327	151.345	707.998	0.000	3464.700			
<i>RND</i>	4523	0.024	0.000	0.075	0.000	0.019	0.065	0.000	1.738			
<i>NWC</i>	4523	0.039	0.035	0.241	-0.041	0.138	0.257	-7.867	0.468			
<i>DIVIDEND</i>	4523	0.483	0.000	0.500	0.000	1.000	1.000	0.000	1.000			
<i>CFO</i>	4523	-0.013	0.015	0.184	-0.023	0.044	0.088	-3.714	0.332			
<b>Panel D: Safe Firms</b>												
<i>TDTA</i>	14991	0.181	0.134	0.231	0.036	0.266	0.388	0.000	8.405			
<i>TDTE</i>	14991	0.407	0.207	1.433	0.037	0.560	1.077	-7.932	9.878			
<i>LTDTA</i>	14991	0.141	0.095	0.159	0.009	0.226	0.346	0.000	1.311			
<i>STDTA</i>	14991	0.038	0.011	0.143	0.002	0.036	0.085	0.000	6.867			
<i>TDTC</i>	14991	0.410	0.209	1.486	0.037	0.567	1.100	-8.208	10.294			
<i>TCJA</i>	14991	0.584	1.000	0.493	0.000	1.000	1.000	0.000	1.000			
<i>SIZE</i>	14991	6.668	6.815	2.527	4.835	8.442	9.902	-1.704	14.492			
<i>ROA</i>	14991	-0.120	0.045	1.028	-0.082	0.104	0.168	-31.529	0.425			
<i>INTANG</i>	14991	0.187	0.104	0.212	0.003	0.317	0.515	0.000	0.805			
<i>CAPEX</i>	14991	175.734	14.757	518.149	1.201	89.500	381.000	0.000	3464.700			
<i>RND</i>	14991	0.068	0.007	0.160	0.000	0.069	0.189	0.000	2.136			
<i>NWC</i>	14991	-0.007	0.014	0.516	-0.068	0.129	0.244	-24.703	0.468			
<i>DIVIDEND</i>	14991	0.398	0.000	0.490	0.000	1.000	1.000	0.000	1.000			
<i>CFO</i>	14991	-0.151	0.016	1.042	-0.089	0.058	0.101	-33.765	0.332			

Panel B shows the descriptive statistics for distressed firms. More than 54 per cent firms (23084 firm-year observations) are distress firms. When we look at their capital structure, we find that more than 60% of their total assets consist of total debt, long-term debt consists of 19% of total assets, and 38% of short-term debt comes from total assets of the sample firms. Panel C shows the descriptive statistics. More than 10.61% firm year observations fall under gray. We find that more than 25% of total financing comes from long-term financing, and only 5% financing comes from short-term financing. Panel D shows that 14.1% firms finance from long-term sources, and only 3.8% firms finance from short-term sources. In sum, we can summarize that distressed firms are highly dependent on external funding or long-term debt financing compared to counter firms (grey and safe firms).

## 4.2 Correlation coefficient

Table 3 presents the correlation coefficients of all variables used in our analyses. TCJA is positively correlated with TDTE and LTDTA and negatively correlated with TDTA and STDTA. The signs and significance of the control variables are consistent with the literature. We do not find any multicollinearity among the variables as VIF was less than 3.

**Table 3. Correlation Statistiks**

	<i>TDTA</i>	<i>TDTE</i>	<i>LTDTA</i>	<i>STDTA</i>	<i>TDTC</i>	<i>TCJA</i>	<i>SIZE</i>	<i>ROA</i>	<i>INTANG</i>	<i>CAPEX</i>	<i>RND</i>	<i>NWC</i>	<i>DIVIDEND</i>	<i>CFO</i>
<i>TDTA</i>	1.000													
<i>TDTE</i>	-0.076	1.000												
<i>LTDTA</i>	0.312	0.074	1.000											
<i>STDTA</i>	0.919	-0.090	0.023	1.000										
<i>TDTC</i>	-0.072	0.861	0.070	-0.086	1.000									
<i>TCJA</i>	-0.004	0.017	0.028	-0.012	0.019	1.000								
<i>SIZE</i>	-0.181	0.148	0.155	-0.221	0.150	0.049	1.000							
<i>ROA</i>	-0.609	0.080	-0.027	-0.618	0.077	0.026	0.226	1.000						
<i>INTANG</i>	-0.030	0.102	0.212	-0.076	0.098	0.009	0.273	0.098	1.000					
<i>CAPEX</i>	-0.030	0.093	0.105	-0.053	0.083	0.000	0.420	0.068	0.027	1.000				
<i>RND</i>	0.214	-0.083	0.021	0.196	-0.077	0.017	-0.149	-0.328	-0.100	-0.090	1.000			
<i>NWC</i>	-0.748	0.069	-0.015	-0.784	0.067	0.008	0.207	0.769	0.084	0.049	-0.195	1.000		
<i>DIVIDEND</i>	-0.075	0.106	0.152	-0.111	0.107	-0.015	0.464	0.136	0.199	0.324	-0.173	0.105	1.000	
<i>CFO</i>	-0.599	0.078	-0.024	-0.611	0.075	0.026	0.217	0.992	0.096	0.065	-0.314	0.764	0.125	1.000

## 4.3 Regression Results

Table 4 presents the regression results of the impact of TCJA on capital structure for the entire sample (based on 42598 firm-year observations). We have three dependent variables (*TDTA*, *LTDTA*, and *STDTA*). The coefficient of *TCJA* is positive and statistically significant in all three specifications, which is contradictory with our assumption that dependence on debt financing would decrease after *TCJA* reform. Because we find, in column (1), that the coefficient of *TCJA* is 0.065, which is statistically significant at 1 per cent level. In the case of long-term debt-based analysis, the coefficient of *TCJA* is 0.045 which is also statically significant at 1 percent level. When we focus on short-term debt-based

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capital structure decision, we find that, in column (3), the coefficient of TCJA on STDTA is 0.010 with p-value of less than 1%.

**Table 4. Regression results of the impact of TCJA on capital structure [pull sample]**

VARIABLES	(1) TDTA	(2) LTDTA	(3) STDTA
TCJA	0.065*** (0.000)	0.045*** (0.000)	0.010*** (0.000)
SIZE	-0.005*** (0.000)	-0.001 (0.105)	-0.004*** (0.000)
ROA	-0.007** (0.001)	-0.002 (0.164)	-0.004* (0.024)
INTANG	0.110*** (0.000)	0.109*** (0.000)	-0.001 (0.897)
CAPEX	0.000 (0.196)	0.000* (0.045)	-0.000 (0.620)
RND	0.0178** (0.010)	0.0119* (0.023)	0.0228 (0.123)
NWC	0.001 (0.285)	0.001** (0.003)	-0.002 (0.075)
DIVIDEND	0.004 (0.465)	0.007 (0.123)	-0.003 (0.250)
CFO	0.006** (0.002)	0.002 (0.289)	0.004** (0.003)
LAG_TDTA	0.023*** (0.000)		
LAG_LTDTA		0.201*** (0.000)	
LAG_STDTA			-0.0140 (0.268)
CONSTANT	0.169*** (0.000)	0.093*** (0.000)	0.057*** (0.000)
<i>N</i>	28952	28952	28952
<i>R</i> <sup>2</sup>	0.082	0.128	0.020
ADJ. <i>R</i> <sup>2</sup>	0.082	0.128	0.019

Taking three measures together, we find that the magnitude of changes in capital structure is greater for the proportion of total debt to total assets compared to the proportion of both long-term and short-term debt to total assets. In sum, we can infer that the dependence on external financing has increased significantly in post-TCJA reform periods, although there are fewer incentives for debt financing caused by decreasing corporate tax rate, limits on interest deductibility and immediate allowance of full bonus depreciation for qualifying assets. Additionally, the lags of TDTA and LTDTA show a positive association at 1% significance level, while the lag of STDTA is negatively associated with no statistical significance. This behavior aligns with the dynamic trade-off theory, which suggests that firms gradually adjust their new leverage position due to adjustment costs like transaction cost, agency cost, their respective distance from target leverage, market conditions, etc. Therefore, the speed of adjustment toward the target capital structure can vary following policy changes. Our results are consistent with prior research (such as Zhange *et al.*, 2023).

With respect to control variables, we find the signs and significance levels are as predicted. For instance, we find that firm size is negatively associated with the capital structure in all three measures. A firm's profitability (ROA) is negatively related to all forms of capital structure, and it implies that profitable firms are less dependent on debt financing. We find that firms with higher intangibles are most likely to get external funding even in post-reform periods, which is evidenced from TDTA and LTDTA measures. The results suggest that fund providers emphasize more on clients' investment in intangible assets, thereby resulting in a positive association between the proportions of debt financing in post-reform periods. Similarly, research and development expenditure (RND) is also positively and significantly associated with capital structure in two dimensions, including long-term financing and total financing. The propensity of debt financing is positively associated with cash flow (CFO). This is because firms with higher liquid assets can borrow funds on favorable terms and conditions. Taken together, this study finds a contradictory finding regarding the impact of Tax Cuts and Jobs Act 2017 on the likelihood of financing from external debts (both long-term and short-term).

#### **4.4 Sub-sample analysis**

To have comprehensive impact of the TCJA reform on capital structure, we divide our entire sample into three different sub-samples based on the financial health of the sample companies. This analysis is motivated by the lack of research on the benefits of TCJA based on firm types, and the prior research concludes that it is not yet clear about the impact of TCJA, i.e. which firm will be benefitted compared to others (Kalcheva *et al.*, 2020). Moreover, not all firms will be equally affected by

TCJA, which motivates us to do this sub-sample analysis. To do so, we use the Altman Z score to categorize all firms. In this paper, Altman Z-score is calculated as  $1.2 (\text{Working Capital}/\text{Total Assets}) + 1.4 (\text{Retained Earnings}/\text{Total Assets}) + 3.3 (\text{Earnings before Interest \& Tax}/\text{Total Assets}) + 0.6 (\text{Market Value of Equity}/\text{Total Liabilities}) + 0.999 (\text{Sales}/\text{Total Assets})$ . A higher score indicates better financial health and hence a lower probability of financial distress.

We categorize a firm as a distress firm if its Z score is less than 1.81, a firm is categorized as grey firm when its Z score is between 1.81 and 2.99, and a firm is categorized as a safe firm when its Z score is greater than 2.99. We find 23084 firm-year observations under distress firms, 4523 firm-year observations under grey firms, and the remaining 14991 firm-year observations under safe firms' categories. We use the same baseline regression equation (1) for all groups of firms. Results are presented in Table 5. The first three columns [1-3] are for distress firms, the next three [4-6] are for grey firms and the last three [7-9] for safe firms. In this section, we also use three forms of capital structure based on total debt, long-term debt, and short-term debt proportion to total assets as dependent variables. The coefficient of TCJA is significantly positive for all three models for distress firms, which is consistent with our main analysis in Table 4. Equally, we find a significantly negative coefficient of TCJA (at 5% significance level) for both grey firms and safe firms with respect to STDTA. The negative results suggest that the dependence on short-term financing decreases significantly in post-reform periods for grey and safer firms. However, safer firms increased their long-term financing following TCJA, which is evidenced by a negative association at 1% level. Moreover, the result implies that safer firms switched from short-term financing to long-term financing in post-reform periods. Lagged values of capital structures mostly show significant persistence across firms, thereby confirming dynamic trade-off behaviors of U.S firms.

For control variables, we find the signs and significance are consistent with our baseline analyses.

Table 5. Regression Results of TCJA on capital structure (subsample analysis)

VARIABLES	Distress Firms			Grey Firms			Safe Firms		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	TDTA	LTDTA	STDTA	TDTA	LTDTA	STDTA	TDTA	LTDTA	STDTA
TCJA	0.070*** (0.000)	0.044*** (0.000)	0.014** (0.005)	-0.005 (0.367)	0.004 (0.495)	-0.009* (0.013)	0.034*** (0.000)	0.0319*** (0.000)	-0.004* (0.027)
SIZE	-0.004** (0.003)	0.001 (0.244)	-0.004*** (0.000)	0.016*** (0.000)	0.021*** (0.000)	-0.005* (0.019)	0.004 (0.147)	0.004* (0.036)	-0.002 (0.329)
ROA	-0.003 (0.125)	0.000 (0.836)	-0.004 (0.053)	-0.252*** (0.001)	-0.198** (0.004)	-0.032 (0.371)	-0.071** (0.002)	-0.047** (0.007)	-0.009 (0.497)
INTANG	0.085** (0.002)	0.084*** (0.000)	0.0070 (0.667)	-0.025 (0.681)	0.078 (0.178)	-0.107*** (0.000)	0.064** (0.003)	0.091*** (0.000)	-0.033** (0.005)
CAPEX	0.000* (0.022)	0.000* (0.019)	-0.000 (0.570)	-0.000 (0.192)	-0.000 (0.462)	-0.000* (0.015)	-0.000 (0.860)	-0.000 (0.982)	0.000 (0.316)
RND	0.005 (0.505)	0.003 (0.588)	0.027 (0.187)	0.078 (0.219)	0.176** (0.010)	-0.085 (0.062)	-0.039** (0.009)	0.007 (0.568)	-0.041*** (0.001)
NWC	0.000 (0.737)	0.001 (0.137)	-0.001 (0.159)	-0.148*** (0.000)	0.326*** (0.000)	-0.476*** (0.000)	-0.175*** (0.000)	0.073*** (0.000)	-0.243*** (0.000)
DIVIDEND	0.011 (0.189)	0.009 (0.267)	0.000 (0.952)	0.013 (0.125)	0.012 (0.191)	-0.000 (0.990)	0.001 (0.716)	0.002 (0.540)	0.001 (0.747)
CFO	0.004* (0.018)	0.000 (0.868)	0.004** (0.009)	0.093 (0.090)	0.102 (0.094)	-0.006 (0.856)	0.049* (0.030)	0.034* (0.049)	0.002 (0.869)
LAG_TDTA	0.011*** (0.000)			0.172*** (0.000)			0.050*** (0.000)		
LAG_LTDTA		0.146*** (0.000)			0.176*** (0.000)			0.193*** (0.000)	
LAG_STDTA			-0.021 (0.227)			0.001 (0.947)			0.007 (0.241)
CONS	0.170*** (0.000)	0.100*** (0.000)	0.053*** (0.000)	0.148*** (0.000)	0.029 (0.373)	0.129*** (0.000)	0.107*** (0.000)	0.046*** (0.001)	0.056*** (0.000)
N	13240	13240	13240	3578	3578	3578	12134	12134	12134
R <sup>2</sup>	0.060	0.080	0.024	0.194	0.206	0.446	0.120	0.139	0.232
ADJ. R <sup>2</sup>	0.059	0.079	0.023	0.191	0.203	0.444	0.119	0.138	0.231

#### 4.5 Financial Flexibility and Capital Structure

Prior research expects that TCJA affects the capital structure of the firm and that TCJA affects the firm-behavior significantly (KPMG, 2018). Financial Flexibility is one of the important determinants of capital structure decisions. Prior research defines financial flexibility as a firm's capacity to mobilize its resources in order to take preventive and exploitative actions in response to uncertain future contingencies in a timely manner to maximize the firm's value (e.g., Byoun, 2008). Financial flexibility is considered, as none of the capital markets is perfect. Frictions in the capital market result in uncertainties and contingencies, thereby financial flexibility is highly emphasized. However, it is not yet clear whether financial flexibility affects US firms' capital structure in post reform periods or not which demands investigation. Taking this tension into account, this section examines the moderating role of financial flexibility on the effect of TCJA on firm capital structure. Using the same set of control variables, we present our analysis in Table 6.

Model (1) present the regression results for the interaction between financial flexibility and TCJA on the firm's capital structure (TDTA) using the total debt to total assets ratio. The coefficient of TCJA is positive and statistically significant at 1 per cent which is consistent with our baseline analysis. The coefficient of financial flexibility is negative and statistically significant at 1 per cent level, which suggests that firms with higher cash holdings are less likely to be dependent on debt financing in post-reform periods. However, the coefficient of interaction (TCJA\* FINFLEX) is positive with TDTA and the result is statistically significant at 1 percent. Model (2) shows the results of the interaction of TCJA and financial flexibility on the capital structure based on the proportion of long-term debt to total assets (LTDTA). The coefficient of TCJA is positive and statistically significant, which is consistent with Model (1). The coefficient of financial flexibility (FINFLEX) is negatively significant at 1 per cent, which suggests that firms with higher cash holdings will depend less on long-term debt financing. However, the interaction of TCJA\*FINFLEX is positively significant at 1 percent which shows the incremental impact of tax reform on LTDTA. Finally, model (3) shows the regression results on the likelihood of capital structure based on short-term debt (STDTA). Consistently, the impact of TCJA on STDTA is positive and statistically significant at 1 per cent suggesting that the dependence of firms on short-term financing increases in post-reform periods, which is consistent with our hypothesis. However the interaction variable (TCJA\*FINFLEX) is negative to STDTA with no statistical significance. Taken together, the results of Table 6 provide consistent empirical evidence, in line with more financially flexible firms have more dependence on long-term debt in post-TCJA periods compared to short-term financing.

**Table 6. Impact of financial flexibility on the impact of TCJA act on capital structure**

VARIABLES	(1) TDTA	(1) LTDTA	(1) STDTA
TCJA	0.061*** (0.000)	0.040*** (0.000)	0.011*** (0.000)
FINFLEX	-0.044*** (0.000)	-0.027*** (0.000)	-0.017*** (0.000)
TCJA*FINFLEX	0.016*** (0.000)	0.016*** (0.000)	-0.001 (0.757)
SIZE	-0.005*** (0.000)	-0.001 (0.131)	-0.004*** (0.000)
ROA	-0.007** (0.002)	-0.002 (0.165)	-0.004* (0.027)
INTANG	0.078*** (0.000)	0.093*** (0.000)	-0.018* (0.036)
CAPEX	0.000 (0.289)	0.000 (0.060)	-0.000 (0.436)
RND	0.016* (0.022)	0.011* (0.039)	0.022 (0.135)
NWC	0.001 (0.298)	0.001** (0.004)	-0.002 (0.075)
DIVIDEND	0.004 (0.422)	0.007 (0.118)	-0.002 (0.298)
CFO	0.006** (0.002)	0.002 (0.302)	0.004** (0.003)
LAG_TDTA	0.023***		
LAG_LTDTA		0.201*** (0.000)	
LAG_STDTA			-0.014 (0.280)
CONS	0.188*** (0.000)	0.104*** (0.000)	0.0648*** (0.000)
<i>N</i>	28952	28952	28952
<i>R</i> <sup>2</sup>	0.090	0.132	0.024
ADJ. <i>R</i> <sup>2</sup>	0.090	0.131	0.023

To gain a clearer understanding of the impact of financial flexibility, we conduct a sub-sample analysis. Results are presented in Table 7. Turning to control variables, we find that firm size (SIZE) is negatively significant across all forms of financing, including total debt to total assets, long-term debt to total assets, and short-term debt to total assets. Results suggest that larger firms are less likely to depend on external financing, particularly in post TCJA periods, compared to pre-TCJA periods. In line with prior research, highly profitable firms depend less on external financing compared to loss-making firms. They prefer to depend on their financial health. Hence, the coefficient of ROA is negatively associated with all forms of capital structures.

Table 7. Regression Results of the impact of TCJA on capital structure (subsample analysis)

VARIABLES	Distress Firms			Grey Firms			Safe Firms		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	TDIA	LTDIA	STDIA	TDIA	LTDIA	STDIA	TDIA	LTDIA	STDIA
TCJA	0.065*** (0.000)	0.039*** (0.000)	0.016*** (0.001)	-0.007 (0.232)	0.004 (0.370)	-0.010** (0.004)	0.033*** (0.000)	0.031*** (0.000)	-0.004* (0.029)
FINFLEX	-0.047*** (0.000)	-0.028*** (0.000)	-0.020*** (0.000)	-0.038** (0.004)	-0.009 (0.469)	-0.030*** (0.000)	-0.020*** (0.001)	-0.005 (0.295)	-0.014*** (0.000)
TCJA*FINFLEX	0.013* (0.022)	0.015** (0.002)	-0.004 (0.375)	0.015 (0.068)	0.006 (0.450)	0.0040* (0.039)	0.005 (0.337)	0.005 (0.255)	-0.001 (0.777)
SIZE	-0.0032** (0.008)	0.0013 (0.189)	-0.004*** (0.000)	0.017*** (0.000)	0.021*** (0.000)	-0.0041* (0.027)	0.005 (0.109)	0.004* (0.045)	-0.001 (0.548)
ROA	-0.003 (0.135)	0.000 (0.826)	-0.004 (0.052)	-0.248** (0.001)	-0.197** (0.004)	-0.028 (0.439)	-0.069** (0.003)	-0.046** (0.008)	-0.008 (0.565)
INTANG	0.049 (0.082)	0.066** (0.005)	-0.014 (0.386)	-0.047 (0.409)	0.073 (0.203)	-0.125*** (0.000)	0.046* (0.044)	0.089*** (0.000)	-0.049*** (0.000)
CAPEX	0.000* (0.037)	0.000* (0.029)	-0.000 (0.517)	-0.000 (0.184)	-0.000 (0.467)	-0.000* (0.022)	-0.000 (0.770)	-0.000 (0.974)	0.000 (0.528)
RND	0.003 (0.756)	0.002 (0.800)	0.026 (0.203)	0.077 (0.226)	0.178 (0.011)	-0.085* (0.027)	-0.039* (0.008)	0.0067 (0.592)	-0.041*** (0.000)
NWC	0.000 (0.671)	0.001 (0.128)	-0.001 (0.169)	-0.162*** (0.000)	0.323*** (0.000)	-0.488*** (0.000)	-0.183*** (0.000)	0.072*** (0.000)	-0.250*** (0.000)
DIVIDEND	0.012 (0.132)	0.009 (0.235)	0.001 (0.770)	0.013 (0.133)	0.012 (0.197)	-0.000 (0.977)	0.001 (0.809)	0.002 (0.572)	0.000 (0.883)
CFO	0.004* (0.023)	0.000 (0.906)	0.004* (0.009)	0.097 (0.075)	0.104 (0.089)	-0.004 (0.905)	0.048* (0.036)	0.033 (0.053)	0.001 (0.936)
LAG_TDTA	0.016*** (0.000)			0.168*** (0.000)			0.051*** (0.000)		
LAG_LTDIA		0.146*** (0.000)			0.175*** (0.000)			0.193*** (0.000)	0.007 (0.255)
LAG_STDIA			-0.020 (0.237)			-0.000 (0.995)			
CONS	0.193*** (0.000)	0.114*** (0.000)	0.063*** (0.000)	0.155*** (0.000)	0.031 (0.350)	0.134*** (0.000)	0.114*** (0.000)	0.049*** (0.000)	0.061*** (0.000)
N	13240	13240	13240	3578	3578	3578	12134	12134	12134
R <sup>2</sup>	0.070	0.084	0.028	0.201	0.207	0.458	0.123	0.140	0.242
ADJ. R <sup>2</sup>	0.069	0.083	0.027	0.197	0.203	0.455	0.122	0.138	0.241

Firms with greater investment in intangible assets depend more on external financing, as they do not prefer to use their own capital for innovation and intangible assets spending. Hence, consistently we find a positive coefficient of INTANG on two forms of capital structures, and the coefficient is statistically significant at 1 per cent level for the long-term debt and total debt model. Similarly, we document a positive and statistically significant impact of a firm's investment in research and development (RND) on capital structure, measured by total debt and long-term debt. Finally, we find that firms with greater operating cash flow (CFO) are highly dependent on external financing, which suggests that firms are optimistic, and they would like to utilize more liquid assets, even borrowing funds from external sources, given they have their own sufficient operating cash flows.

## 5. Robustness

To ensure robustness of the documented relation between tax reform (TCJA) and capital structure choices, we use two different measures of the dependent variable (i.e., capital structure) following prior research. First, we measure capital structure by taking a ratio of total debt to total equity (TDTE), and second, we compute the ratio of total debt to total share capital (TDTC) of the sample firm. To ensure the results are not irrelevant, negative TDTE and TDTC values have been excluded. We employ our main equation to see the impact of TCJA on capital structure using the same set of control variables. Results are presented in Table 8. Results show that the coefficient for TCJA is positive and statistically significance in both alternative models, supporting our main regression results on the impact of tax reform on capital structure choices in U.S. firms. Control variables show the statistical significance and signs consistent with our main analysis. In sum, our inferences remain valid with alternative measures of our capital structure.

**Table 8. Results with alternative measure of capital structure**

<b>VARIABLES</b>	<b><u>TDTE</u></b>	<b><u>TDTC</u></b>
<i>TCJA</i>	0.325*** (0.000)	0.353*** (0.000)
<i>CONTROLS</i>	Yes	Yes
<i>INDUSTRY CONTROLLED</i>	Yes	Yes
<i>YEAR EFFECTS CONTROLLED</i>	Yes	Yes
<i>CONSTANT</i>	0.927*** (0.000)	0.958*** (0.000)
<i>N</i>	27242	27242
<i>R<sup>2</sup></i>	0.072	0.074
<i>ADJ. R<sup>2</sup></i>	0.071	0.074

## 6. Conclusion

This paper investigates the impact of the Tax Cuts and Jobs Act of 2017 on the capital structure decisions of US firms. The present study is highly motivated by the call for research of prior research (e.g., Kalcheva *et al.*, 2020), who documented that the greater benefit of TCJA went to shareholders through corporate payout, although they conjectured that greater benefit should be vested on high growth opportunity firms and financially constrained firms. However, the authors urged further study of the impact of TCJA on capital structure decisions, as it is a major structural tax reform in the USA since the Tax Reform Act of 1986, and could affect firms' financing decisions. Moreover, TCJA 2017 introduced a number of provisions regarding tax rate, bonus depreciation, restrictions on interest deductibility, limitation on net operating loss (NOL) carryforward, and amortization of research and development (R&D). Taking the above issues into consideration, this study intends to examine the possible impact of TCJA on capital structure. Moreover, to date, there is no empirical evidence of the impact of the TCJA Act 2017 on capital structure, which provides the novelty of the present study.

This study uses several proxy measures of capital structure and tests how tax reform affects firms' capital structure decisions. The results align conceptually with dynamic trade-off theory, showing that firms gradually adjust their capital structure following policy reforms rather than instantly arriving at the new leverage level. Next, this paper also tests the moderating effect of firm-level financial flexibility on the relation between tax reforms on capital structure decisions. This study finds that firms with greater financial flexibility are less likely to dependent on external financing. Furthermore, we divide our entire sample into distressed firms, grey firms and safe firms based on financial distress measures to see the responsiveness of TCJA on capital structure.

The results of this study show that firms' dependence on short-term financing compared to long-term financing increases significantly in the post-TCJA periods. The positive relation between tax reform and capital structure is highly pronounced in distressed firms. Our results are robust to an alternative measure for capital structure and financial flexibility. Readers should take caution in generalizing our results as we focus on firm fundamentals and variables related to capital structure decisions only. Future researchers can extend our research by taking the impact of corporate governance quality or managerial ability to present a comprehensive picture the impact of TCJA on capital structure. Future researchers might also segregate the impacts of individual provisions of TCJA to identify which factor primarily drives debt financing, as our study focused on the net effect of TCJA on corporate capital structure. Additionally, future researchers could examine the impact of TCJA on loan loss provisioning in the U.S. and other jurisdictions.

Despite the above limitations, this study will be highly relevant for the researchers who intend to see the impact of U.S. tax reform on capital structure, shareholders' wealth, investment decision, cost of capital, loans provisioning, and foreign direct investment (FDI). Moreover, we believe our study will be relevant to academics, policymakers, and practitioners who intend to evaluate the empirical and economic consequences of historical tax policy changes in USA.

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