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by

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Abstract

This study investigates the firm-level consequences to capital expenditure levels from the passing of the Tax Cuts and Jobs Act of 2017 (TCJA). It theorized that favorable tax provisions in the TCJA would cause firms to increase their levels of capital expenditures. To test this hypothesis, the study analyzed the capital expenditure levels of public firms from 1986-2019 controlling for factors such as national gross domestic product (GDP) growth and used a dummy variable of reporting periods after 2018 to represent the effects of the TCJA. In contrast to the original hypothesis, the results demonstrate that the TCJA had a statistically significant small negative effect on the level of capital expenditures after 2018 independent of other macroeconomic, industry, and firm-level factors.

I. Introduction

This study examines how the Tax Cuts and Jobs Act of 2017 (TCJA) has affected capital expenditures at the firm level. The critical question that the research focuses on is has the TCJA changed firm-level behavior toward capital expenditure levels?

The main arguments in favor of the TCJA focused on the large influx cash companies would receive as a result of the law would be funneled into higher wages and large capital investments in the United States (Chalk, 2018). Wage growth has been well tracked following the passage of the TCJA by the Bureau of Economic Analysis, but capital expenditures have not been focused on as much. The TCJA lowered corporate tax rates from a top rate of 35% to a flat rate of 21%. It also authorized a tax holiday for companies to repatriate overseas profits. The TCJA also specifically incentivizes capital investments by including a 100% bonus deprecation provision which allows the expensing of capital investments immediately versus over time using the traditional Modified Accelerated Cost Recovery System. That provision lowers taxable income in the year of purchase which in turn lowers the overall tax bill of the company.

If the TCJA can be shown to increase capital expenditure levels, it reinforces the case that the act was effective in fulfilling its stated purpose. It also shows successful coordination of desired behavior and tax incentives. Policymakers in the future could use this example to argue for other tax incentives to encourage wanted behaviors. If not, the long-term projected price tag for the law would likely be much larger since capital expenditures provide the base of the projected economic growth. Without that growth, future tax revenues likely could be below projected levels resulting in higher overall costs for the tax cuts.

II. Motivation and Prior Literature

The Tax Cuts and Jobs Act of 2017 (TCJA) was one of the major legislative accomplishments of the first half of President Trump's first term. One of the main thrusts of the TCJA is to encourage capital expenditures through tax incentives. Preliminary results do show that capital expenditure totals in aggregate are up across the board according to Kopp, 2019. The question then emerges to what amount (if at all) the increase was caused by TCJA directly.

The hypothesis proposed at the beginning of the research that the extra tax incentives in the TCJA were enough to change companies' capital expenditures levels in a statistically significant way. The study needed to have a method to isolate the effects of the TCJA from other macroeconomic, industry, and firm-level effects. Prior research has not formulated a comprehensive model of capital expenditures but did identify the control variables such as GDP growth, stock returns, and industry fixed effects (Welch, 2000); (Abedin, 2017); (Hamadi, 2015). The study used these variables of interest to create a model that uses them in conjunction with a TCJA dummy variable to explain what affects the capital expenditure levels of a firm for a given year.

III. Data

This study analyzed the effects of the Tax Cuts and Jobs Act of 2017 on publicly owned United States based firms who had a year-end on 12-31 from 1987-2019. This range was chosen as it includes all the years after the previous major tax reform in 1986. The sample includes data from Compustat- Capital IQ from Standard & Poor's, Center for Research in Security Prices (CRSP), and the U.S. Bureau of Economic Analysis (BEA). Data from Compustat and CRSP were matched together to coordinate company data with its stock returns. If a company did not have data in both sets for a given year, it was not included in the sample. Companies were also not included if they had missing or negative capital expenditures (for year t and year t-1), missing or negative total assets (for year t and year t-1), missing SIC code (for industry classification), and missing return data from CRSP for months t-23 to t-12. Capital expenditures were scaled by assets in year t-1 to avoid extremely large companies dominating the data set. The ending sample was 79,002 firm-year observations.

The limitations of the data set include only two years of post-TCJA data (2018 & 2019), possible lack of significant control variables, and completeness of the data set. With the limitations of only having two years of data, it is difficult to project the continuation of the trends past 2019 because there could be outside factors that constantly change for capital expenditures. For example, the Coronavirus Pandemic almost certainly reduced capital expenditure levels across the economy during the start of 2020. The design of the study to isolate the effects of the TCJA through the removal of the other control variables allows for the possibility that other significant control variables were not identified. These could once account for might remove the statistical significance of the TCJA dummy variable. The data set only includes data for year-end publicly traded companies inside the Compustat data set. A significant amount of companies do not fall into that category and variations in these other companies' behavior could wash away the significance of the TCJA variable if taken as a whole. This model also only accounts for levels of capital expenditures which are scaled by total assets and not in the changes capital expenditures which merits further investigation if the trend holds up.

IV. Methodology and Results

The following regression measures firm-level capital expenditures. The most extreme 1% on both sides of the distribution were trimmed for capital expenditures in year t, capital expenditures in year t-1, and stock returns. If an observation had data in the trimmed section it was not included in the regression. Industry 12 was used as the baseline to calculate industry fixed effects. Industry 12 is a catch-all category for companies that don't fit in the other categories, so it was the best group to compare against the others.

Capital expenditures are modeled under the equation:

$$(CAPEX_{i,t}/Assets_{i,t-1}) = \beta_0 + \beta_1(CAPEX_{i,t-1}/Assets_{i,t-2}) + \beta_2 Momentum_{i,t-1} + \beta_3 GDPGrowth_{t-1} + \beta_4 ATCJA + \varepsilon_{i,t} \quad (1)$$

Regression (1) is estimated with industry fixed effects.

Variables presented include:

$CAPEX_{i,t}$ is firm *i*'s capital expenditures in year *t* from Compustat, $Assets_{i,t}$ is firm *i*'s total assets in year *t* from Compustat,

$Momentum_{i,t-1}$ is firm *i*'s stock returns from the reporting date minus 23 months to the reporting date minus 12 months (Since this model is looking at t-1 if reporting date is 12/31/2001, stock returns from 1/1/2000-12/31/2000 are used for that observation)**,

$GDPGrowth_t$ is year t's growth in United States GDP from the BEA. (Since this model is looking at t-1 and if reporting date was 12/31/2001, the GDP growth of 2000 is used), ***

ATCJA: Dummy variable that equals 1 on or after 12/31/18 and 0 otherwise,
Ind# is the industry-specific aggregated fixed effects to capital expenditures on average based on Ind12 as a baseline (i.e. Companies in Industry 10 on average spend 2.79% less on capital expenditures than companies in Industry 12 with all other factors equal) (Fama and French)*
*Retrieved from Compustat- Capital IQ from Standard & Poor's
**Retrieved from Center for Research in Security Prices
***Retrieved from U.S. Bureau of Economic Analysis

Standard errors are clustered by firm and year to control for cross-sectional and time-series variation in the residuals. For example, errors for Company X in year t may be correlated to errors for Company X in year t-1 as well as errors for Company X in year t may be correlated to errors for Company Y in year t.

Parameter	Coefficient	Standard Error	T	P-Value
Intercept (β_0)	0.0582	0.0030	19.2669	0.0000
$CAPEX_{i,t-1}$* **	0.0025	0.0008	3.0422	0.0023
$Momentum_{i\ t-1}$* **	0.0131	0.0016	8.1432	0.0000
$GDPGrowth_{t-1}$* **	0.0038	0.0007	5.2742	0.0000
ATCJA* **	-0.0097	0.0014	-7.0537	0.0000
Ind1* **	-0.0205	0.0031	-6.6510	0.0000
Ind2* **	-0.0153	0.0035	-4.4063	0.0000
Ind3* **	-0.0178	0.0025	-7.1979	0.0000
Ind4* **	0.0820	0.0072	11.4048	0.0000
Ind5* **	-0.0126	0.0037	-3.4097	0.0007
Ind6* **	-0.0243	0.0025	-9.7022	0.0000
Ind7* **	0.0142	0.0046	3.0947	0.0020
Ind8	0.0039	0.0049	0.7934	0.4276
Ind9	-0.0044	0.0035	-1.2390	0.2153
Ind10* **	-0.0279	0.0028	-9.9948	0.0000
Ind11* **	-0.0606	0.0032	-18.8153	0.0000
Ind12*	Standard	Standard	Standard	Standard
Observations	79,002			
R^2	.2626			
Adjusted R^2	.2625			

*See Appendix 1 for additional details of industry codes (Fama and French)
**All Values are rounded to the ten-thousandths place
*** Statically significant at 1% level

The control variables and the variable of interest were all statistically significant displaying the necessity of their inclusion in the model. Two industries (Utilities and Retail) were not shown to be significant but that may be due to similarities with those industries' capital expenditure behavior and the catch-all nature of Industry 12. The all-important ATCJA dummy variable was statistically significant although in a surprisingly small negative way. The coefficient shows that firms after the passing of the TCJA invest 0.97% less (as a percentage of assets) once the other significant factors are controlled for. The Adjusted R^2 value of .2625 means that 26.25% of the total variation of the data was explained by the model.

V. Conclusion

This study investigated the effects of the Tax Cuts and Jobs Act of 2017 (TCJA) on firm-level capital expenditure levels. To accomplish this, a model was developed to measure capital expenditures levels using multiple variables to track the effects of the TCJA with a dummy variable before or after the effective start of the TCJA to calculate the effects directly attributable to TCJA. The results of the statistical analysis show that the TCJA surprisingly had a statistically significant small negative effect after isolating it from other variables. The reasoning for the lack of positive direct effects of the TCJA to capital expenditures is likely quite diverse. It is possible that companies make capital expenditure decisions without much regard to the tax environment and only enjoy the benefits as a happy side effect. It is also possible that the law incentivized other alternatives to use the tax savings so much that capital expenditures were an afterthought. The stockholder-friendly use of the saving to initiate stock buybacks were one alternative which experienced significant increase according to Bennett, 2019 as a result of the TCJA. Another alternative was to increase employee wages which improves company morale and projects well to outside observers. The Bureau of Economic Analysis Table 2.1 shows 9.2% increase in the personal income of Americans from fourth quarter of 2017-fourth quarter of 2019. Finally, the other factors affecting capital expenditures such as general GDP growth could be pushing companies to their maximum comfort levels for expansion and the tax incentives were unable to provide accelerant in this section. Overall, these reasons and others likely combine to provide the small negative effect of the TCJA on capital expenditure levels.

These results can be of interest to researchers and tax policymakers in the future. The researchers can use it as a base to create a more comprehensive model to measure the factors that affect capital expenditures. This could lead to a better way to measure how different actions affect capital expenditure. They can also investigate if the trends from 2018 and 2019 have continued in reaction to the Coronavirus pandemic in early 2020. Policymakers could use this information to avoid creating similar incentives in the future as it does not seem to have produced its intended results in the first two years at least regarding directly increasing capital expenditures. Capital expenditures are the engine of growth for the economy and taking actions that lower its implementation probably should be avoided.

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Appendix 1- Industry Codes Meaning

Grouped by Standard Industrial Classification Code System (Fama and French)

Ind 1- Consumer NonDurables - Food, Tobacco, Textiles, Apparel, Leather, Toys

Ind 2- Consumer Durables - Cars, TVs, Furniture, Household Appliances

Ind 3- Manufacturing - Machinery, Trucks, Planes, Off Furn, Paper, Com Printing

Ind 4- Energy - Oil, Gas, and Coal Extraction and Products

Ind 5- Chemicals - Chemicals and Allied Products

Ind 6- Business Equipment - Computers, Software, and Electronic Equipment

Ind 7- Telecommunications - Telephone and Television Transmission

Ind 8- Utilities - Utilities

Ind 9- Shops - Wholesale, Retail, and Some Services (Laundries, Repair Shops)

Ind 10- Health - Healthcare, Medical Equipment, and Drugs

Ind 11- Money - Finance

Ind 12- Other - Mines, Constr, BldMt, Trans, Hotels, Bus Serv, Entertainment