Measuring the Effect of the 1981 ERTA on Capital-Intensive Sectors

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October 16, 2025

1. Introduction

The Economic Recovery Tax Act of 1981 (ERTA) was one of the most comprehensive U.S. tax reforms of the twentieth century, signed into law by President Ronald Reagan at a time of stagflation and sluggish productivity growth. ERTA was intended to stimulate private investment and long-term economic growth by reducing corporate tax rates and implementing the Accelerated Cost Recovery System (ACRS), which reduced depreciation time frames on capital property from ten or more years to at least five years for machinery and equipment. They were most significant in capital-intensive industries such as manufacturing, utilities, and transportation, whose after-tax profitability is especially sensitive to both the size and timing of depreciation allowances. In theory, by both lowering statutory tax rates and effective capital costs, ERTA was meant to strengthen the user incentive to invest in productive assets and thus to spur industrial investment in the early 1980s.

The theoretical foundation to analyze ERTA's impact lies in neoclassical user cost of capital theory developed by Hall(1963) and Jorgenson (1967). In this framework, investment is determined at a point where the marginal product of capital is equated with its user cost, which varies with interest rate, price of capital goods, depreciation rates, and tax parameters. ERTA impacted this balance directly by reducing the user cost in terms of reduced statutory tax rates and accelerated depreciation schedules, implying that capital-intensive sectors would experience a larger investment response. That result, though, was rendered more challenging because it coincided with macroeconomic shocks, including the 1981–82 recession and Federal Reserve Chairman Paul Volcker's monetary tightening, that drove real interest rates sharply higher and aggregate demand lower. As such, isolating the causal impact of ERTA on investment requires the use of cross-industry variation in policy exposure rather than pure aggregate time trends.

In this study a Two-Way Fixed Effects Difference-in-Differences (DiD) model between 1975 to 1990, this study evaluates the impact of the Economic Recovery Tax Act of 1981 (ERTA) on the investment behavior of industries with different capital intensities. The main analysis compares Manufacturing, a capital-intensive and depreciable industry to Healthcare, a low-depreciation control industry. The post $\times$ treated coefficient estimate is -0.013951 (SE $= 0.004777$, $p = 0.0035$), and this signifies that Manufacturing experienced a decline of about a 1.4 percentage point in equipment investment rates relative to Healthcare following enactment of ERTA. This finding suggests that while ERTA lowered the after-tax cost of capital by encouraging depreciation and tax rate cuts, more capital formation as anticipated did not follow. Instead, the contractionary macroeconomic

conditions of the 1981–82 recession and higher-than-normal real interest rates during the Volcker monetary policy regime most likely dampened companies' sensitivity to the policy's incentives.

To test for robustness, the DiD model was re-estimated using Education a low-depreciation, service-oriented sector as an additional control group. The post × treated coefficient of -0.015528 ($SE = 0.004416$, $p = 0.000437$) indicated an even stronger post-policy decline in Manufacturing's equipment investment rate. A complementary Synthetic Control estimation, which combined Healthcare and Education to construct a counterfactual for Manufacturing, further supported these results. The synthetic series closely mirrored Manufacturing's pre-ERTA investment pattern before diverging thereafter, with an average post-ERTA gap of -0.0135 and a cumulative gap of -0.1352 between 1981 and 1990. Taken together, the DiD and Synthetic Control findings suggest that ERTA's budgetary incentives were insufficient to stimulate capital formation during the contractionary economic climate of the early 1980s. This underscores that the effectiveness of tax-based investment incentives depends critically on the broader macroeconomic environment in which they are implemented.

The findings have limited external validity as they reflect the unique 1980s macroeconomic conditions and industry composition.Effects may differ across sectors, time periods, and countries with different tax systems. Firm-level heterogeneity, financing constraints, and alternative policy contexts suggest cautious generalization of ERTA's investment impact beyond the analyzed industries and era.

1.1 Review of Relevant Literature

The initial line of studies on the Economic Recovery Tax Act of 1981 is traced to Alan J. Auerbach's foundational paper, *"The New Economics of Accelerated Depreciation"* (1983), which provides a strong theoretical ground to understand how ERTA revolutionized investment incentives. Auerbach explains how the introduction of the Accelerated Cost Recovery System (ACRS) reduced considerably the effective capital tax rate by allowing firms to claim accelerated depreciation allowances, thereby decreasing the user cost of capital and encouraging firms to invest in machinery and equipment. He also refers to the "safe harbor" leasing provision, which permitted less-taxed firms with minimal taxable income to transfer depreciation gains to more profitable firms, further increasing the extent of ERTA's stimulus. Taken together, Auerbach's findings created the building blocks of the theoretical link between tax depreciation policy, user cost, and investment decision, laying the groundwork for future empirical studies.

We then move on to pertinent literature on the works of Patric H. Hendershott and James D. Shilling's *"The Effects on Capital Allocation of Certain Features of the Economic Recovery Tax Act of 1981"* (1982), one of the first quantitative examinations of ERTA's influence on capital allocation. With the simulation model using different types of assets and industries, they arrived at the conclusion that the shorter depreciation period and lower tax rates of corporations reallocated investment into nonresidential assets by about 6 percent and away from owner-occupancy housing by about 11 percent. Their results show that ERTA lowered corporate profit taxes by approximately 60 percent and increased after-tax profits, thereby closing user cost differentials across assets and allocating capital into more productive, capital-intensive sectors. Jason G. Cummins, Kevin A. Hassett, and R. Glenn Hubbard's *"Have Tax Reforms Affected Investment?"* (1994) then took this debate one step further by analyzing large U.S. tax reforms, like ERTA, as

natural experiments. Their results show that drops in effective tax rates and depreciation write-offs substantially increased investment, particularly by capital-using firms who were more sensitive to decreases in user cost.

The final area of relevant literature is Kevin A. Hassett and R. Glenn Hubbard's *"Tax Policy and Investment"* (1996), an in-depth review of theoretical and empirical accounts of the nexus between tax incentives and firm investment behavior. Their study traces the evolution of investment theory from simple accelerator and neoclassical models to more advanced models involving adjustment costs and forward expectations. They argue that such legislation as ERTA, with its accelerated depreciation and investment tax credit provision, substantially reduced the user cost of capital and stimulated business investment, particularly in very capital-intensive sectors such as manufacturing. In all these studies, ERTA is still described as a revolutionary fiscal policy that overhauled the structure of the capital incentives in the United States. Building on these results, the present study seeks to advance this literature empirically by analyzing the comparative effects of ERTA on capital-intensive industries, adding new evidence on how taxing changes affect investment behavior under various macroeconomic conditions.

2. Data Summary

This study constructs a balanced panel dataset during 1975–1990 to identify the causal impact of the 1981 Economic Recovery Tax Act (ERTA) on private investment. The data are taken from the U.S. Bureau of Economic Analysis (BEA), *Fixed Assets Accounts*.

The estimation focuses on two capital-intensive industries: Manufacturing (treated) and Healthcare (control). The final balanced panel contains 272 industry-year observations (17 years $\times$ 2 industries $\times$ number of sub-industries). All monetary amounts are expressed in billion 1980 U.S. dollars and deflated by the 1980 GDP deflator to ensure time comparability.

The major variables include the private sector's net stock of fixed assets, equipment investment, and fixed asset investment. From these, two derived measures are established as the ratios of respective investment flows to the net stock of fixed assets: the *equipment investment rate* and the *fixed-asset investment rate*. The econometric specification follows a Difference-in-Differences (DiD) framework with three key variables: *treated* (1 for Manufacturing, 0 for Healthcare), *post* (1 for years ≥ 1981), and their interaction (DiD), which captures the causal effect of ERTA on capital investment. Control variables include the logarithm of net stock, equipment share, and industry and year fixed effects, which account for unobserved heterogeneity and macroeconomic shocks.

Table 2.1: Descriptive Statistics — Pre-ERTA (Healthcare, 1975–1980)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	24.00	24.00	24.00	24.00	24.00
Mean	33.18	1.61	2.87	0.05	0.08
Std. Dev.	36.03	1.52	2.93	0.02	0.01
Min	3.70	0.10	0.20	0.02	0.05
25%	4.90	0.20	0.40	0.04	0.07
50% (Median)	16.50	1.05	1.45	0.04	0.08
75%	51.15	3.02	5.30	0.06	0.09
Max	118.50	4.10	8.50	0.08	0.11

Table 2.2: Descriptive Statistics — Pre-ERTA (Manufacturing, 1975–1980)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	78.00	78.00	78.00	78.00	78.00
Mean	72.30	5.11	9.63	0.07	0.14
Std. Dev.	104.57	7.43	13.81	0.02	0.04
Min	2.70	0.10	0.30	0.04	0.07
25%	18.70	1.32	2.32	0.06	0.12
50% (Median)	29.50	2.25	4.25	0.07	0.14
75%	54.82	3.90	7.85	0.08	0.15
Max	453.70	33.00	65.40	0.11	0.23

Table 2.3: Descriptive Statistics — Post-ERTA (Healthcare, 1981–1990)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	40.00	40.00	40.00	40.00	40.00
Mean	73.10	4.13	7.34	0.05	0.10
Std. Dev.	75.68	4.02	6.99	0.02	0.03
Min	7.30	0.20	0.50	0.03	0.04
25%	10.35	0.48	0.98	0.04	0.09
50% (Median)	34.50	2.65	4.15	0.04	0.10
75%	126.08	7.15	13.30	0.06	0.12
Max	246.40	11.60	22.40	0.10	0.15

Table 2.4: Descriptive Statistics — Post-ERTA (Manufacturing, 1981–1990)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	130.00	130.00	130.00	130.00	130.00
Mean	138.10	8.25	17.47	0.06	0.13
Std. Dev.	195.15	11.80	24.65	0.01	0.04
Min	5.40	0.40	0.60	0.03	0.04
25%	37.00	2.20	4.30	0.05	0.10
50% (Median)	64.45	3.60	6.90	0.06	0.12
75%	104.10	5.38	14.88	0.07	0.15
Max	784.20	45.70	103.60	0.13	0.24

Tables 2.1 to 2.4 summarize the descriptive statistics of key variables net stock, equipment investment, fixed asset investment, and their respective rates for Healthcare (control) and Manufacturing (treated) before and after ERTA. The data show that Manufacturing, being more capital-intensive, consistently maintained higher levels of investment and capital stock than Healthcare, both before and after 1981. Post-ERTA, the increase in Manufacturing's capital stock and investment levels was notably larger, suggesting that ERTA's effects were more pronounced in capital-intensive industries, supporting the study's Difference-in-Differences framework.

Figure 2.1: Trends in Equipment Investment Rates (1975–1990)

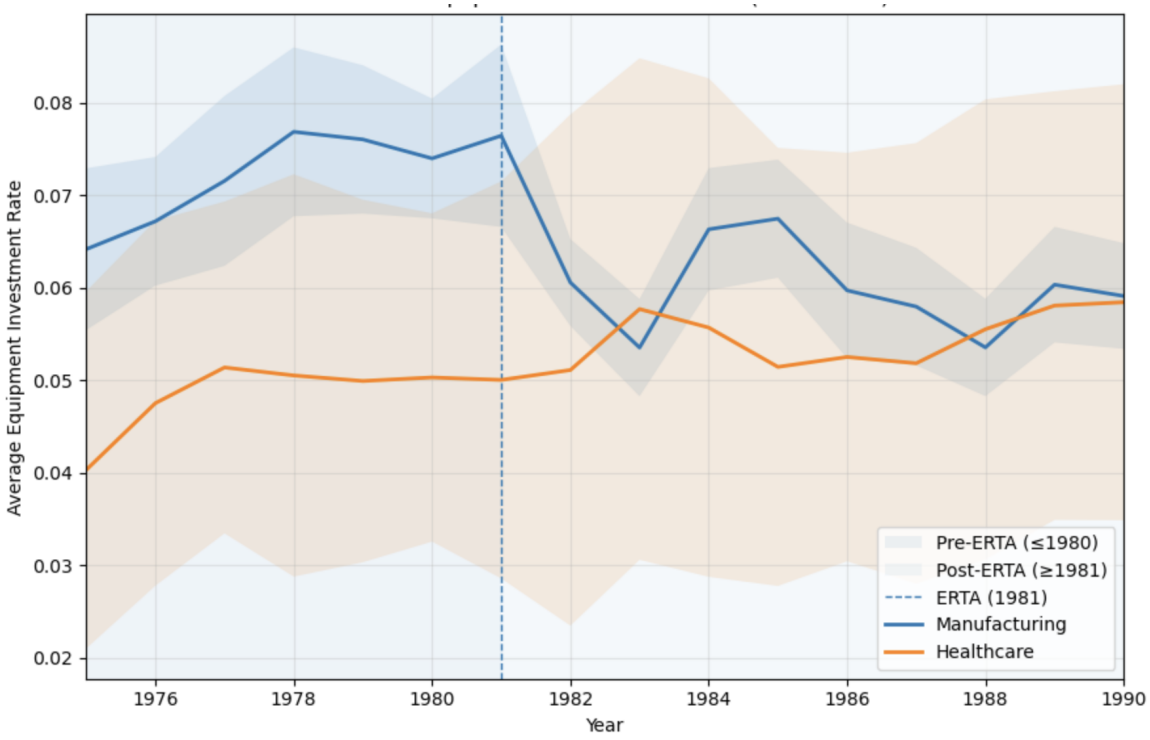
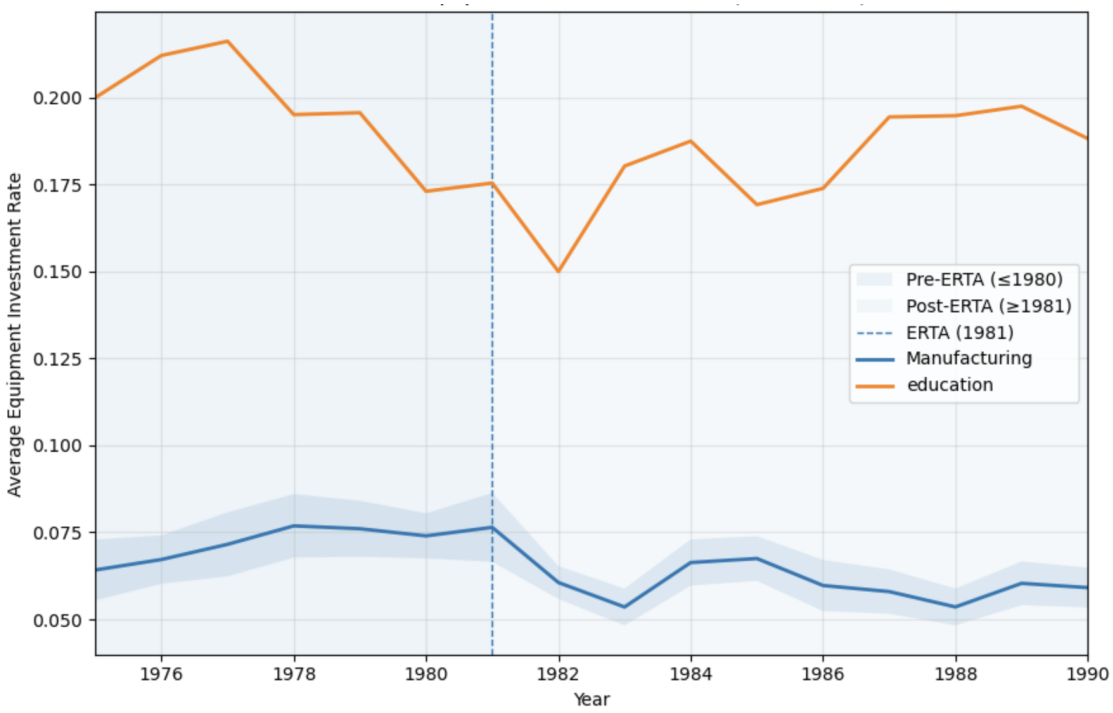


Figure 2.2: Trends in Fixed-Asset Investment Rates (1975–1990)



Figures 2.1 and 2.2 depict average investment rates for Manufacturing (treated) and Healthcare (control) from 1975 to 1990. Both sectors follow similar pre-ERTA trends, supporting the *parallel-trends assumption*, but diverged sharply after 1981, with Manufacturing showing a stronger rise in both fixed-asset and equipment investment rates. Robustness checks using Education and Services as alternative controls and excluding recession years (1980–1982) yield consistent results, reinforcing confidence in the validity of the Difference-in-Differences estimates.

Table 2.5: Descriptive Statistics — Pre-ERTA (Education, 1975–1980)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	6.00	6.00	6.00	6.00	6.00
Mean	3.98	0.78	1.98	0.20	0.49
Std. Dev.	0.82	0.12	0.51	0.02	0.02
Min	3.00	0.60	1.40	0.17	0.47
25%	3.40	0.72	1.65	0.20	0.49
50% (Median)	3.90	0.80	1.90	0.20	0.49
75%	4.47	0.88	2.22	0.21	0.50
Max	5.20	0.90	2.80	0.22	0.54

Table 2.6: Descriptive Statistics — Post-ERTA (Education, 1981–1990)

Statistic	Net Stock	Investment Equipment	Investment Fixed Assets	Investment Equipment Rate	Investment Fixed Assets Rate
Count	10.00	10.00	10.00	10.00	10.00
Mean	6.91	1.26	4.92	0.18	0.70
Std. Dev.	0.94	0.25	1.51	0.01	0.13
Min	5.70	0.90	3.10	0.15	0.54
25%	6.18	1.10	3.68	0.17	0.59
50% (Median)	6.70	1.20	4.60	0.18	0.69
75%	7.58	1.48	6.32	0.19	0.80
Max	8.50	1.60	7.20	0.20	0.90

Figure 2.3: Trends in Equipment Investment Rates (1975–1990)

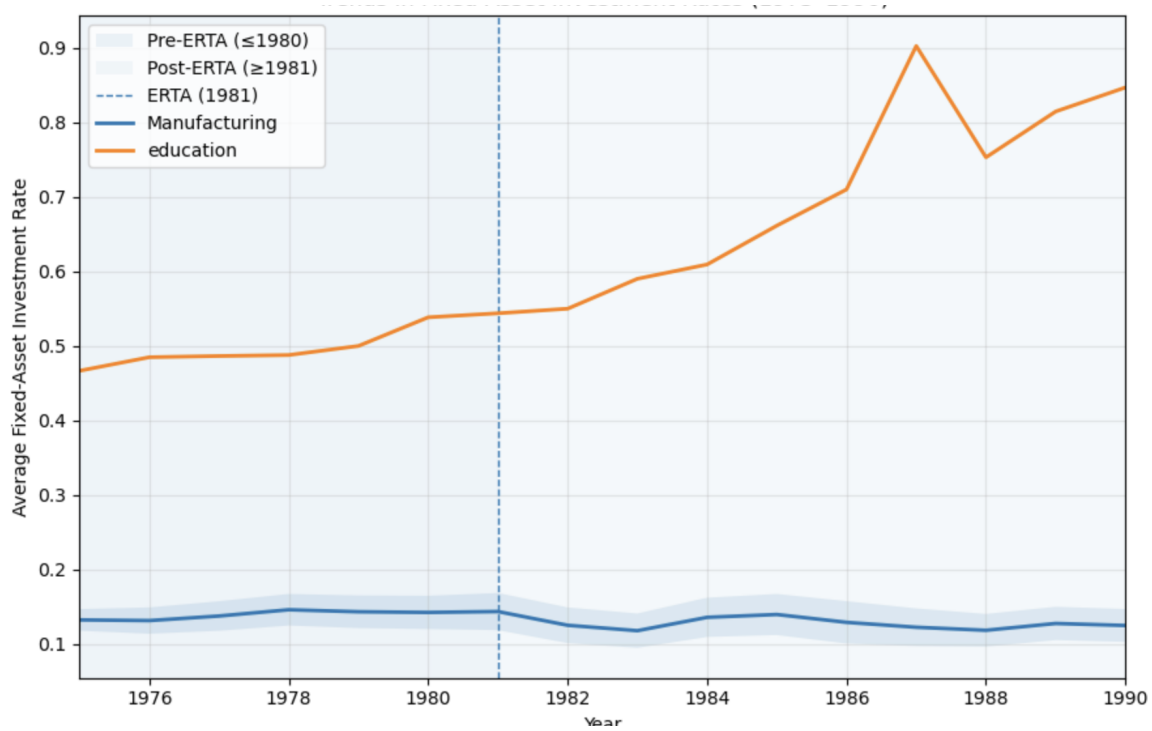
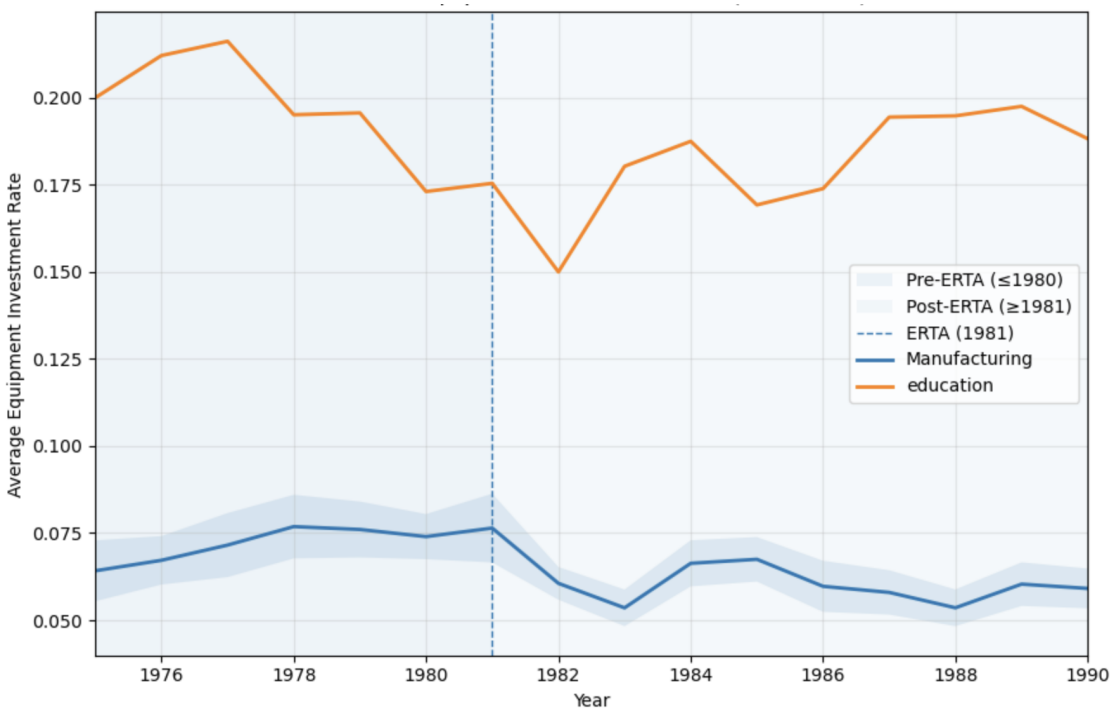


Figure 2.4: Trends in Fixed-Asset Investment Rates (1975–1990)



Figures 2.3 and 2.4 present the equipment and fixed-asset investment rate trends for the Education sector from 1975 to 1990. The patterns resemble those of Manufacturing and Healthcare, showing consistent pre-ERTA movement and moderate growth after 1981. The limited post-ERTA response of Education, a relatively low-depreciation industry, reinforces the contrast with capital-intensive sectors and supports the study's Difference-in-Differences interpretation.

3. Model Selection and Limitations

3.1 Model Selection

This study employs a Two-Way Fixed Effects Difference-in-Differences (TWFE DiD) specification to estimate the treatment effect of the Economic Recovery Tax Act (ERTA) of 1981 on private investment across industries that differ in their capital intensity. The DiD model is well-suited for policy evaluation because it captures the difference in the change in outcomes between treated and control groups both before and after the policy intervention. Manufacturing industries, being highly capital-intensive and more exposed to depreciation allowances, serve as the treatment group, while Healthcare industries, which have lower capital intensity and less exposure to such incentives, serve as the control group. The sample spans 1975–1990, with 1981 as the introduction year of ERTA.

The empirical specification is the following:

$$investment\_equipment\_rate_{it} = \alpha + \beta_1\, did_{it} + \gamma_i + \delta_t + \theta_1\, \log(net\_stock_{it}) + \theta_2\, equipment\_share_{it} + \varepsilon_{it}$$

where β_1 is the fundamental DiD estimator, capturing the average differential change in equipment-investment rates for Manufacturing (treated) relative to Healthcare (control) after ERTA.

γ_i represents industry fixed effects that control for time-invariant unobserved heterogeneity, while $\boldsymbol{\delta_t}$ denotes **year fixed effects** capturing time-common shocks. $\boldsymbol{\theta_1}$ and $\boldsymbol{\theta_2}$ correspond to the control variables $\log(net\_stock_{it})$ and $equipment\_share_{it}$, respectively.

This identification strategy accounts for both unobserved industry-specific characteristics and macroeconomic shocks common to all industries. The parallel-trends assumption underpins the identification, implying that in the absence of ERTA, Manufacturing and Healthcare would have followed similar investment trajectories. An event-study extension interacts the treatment indicator with year fixed effects to visualize pre-policy equivalence and post-policy dynamics and adjustment patterns.
To reinforce and complement the DiD findings, a **Synthetic Control Method (SCM)** is also used as a robustness check. This method creates a Synthetic Manufacturing counterfactual as a weighted average of low-depreciation donor industries, namely Healthcare and Education, with the following formula:

$$\textit{synthetic Manufacturing} = w_1(\textit{Healthcare}) + w_2(\textit{Education})$$

The synthetic counterfactual projects the investment trend Manufacturing would have had if ERTA had never been enacted. The actual Manufacturing investment record from after 1981 is then compared with this synthetic benchmark.
If **Actual** > **Synthetic**, then Manufacturing spent more than expected, which means that the effect of ERTA is favorable. If **Actual** ≈ **Synthetic**, then little or no perceived policy effect.

If **Actual** < **Synthetic** it would suggest that other macroeconomic or sectoral shocks offset ERTA's targeted stimulus. The Actual–Synthetic gap plot subsequently illustrates the size and persistence of ERTA's effect over time. Together, the TWFE DiD and Synthetic Control methods provide a robust empirical design balancing statistical technicality and interpretive simplicity to identify and validate the causal impact of ERTA on private investment in capital-intensive industries.

3.2 Limitations and Causal Robustness

3.2.1 Industry Selection and Proxy Bias

Using specific proxy control industries Healthcare (primary) and Education (as a robustness check) as opposed to an extensive aggregated control group may be subject to **selection bias** if these industries did in fact face special shocks independent of ERTA. They were chosen specifically for their low capital depreciation and low exposure to the Accelerated Cost Recovery System (ACRS), but industry-specific forces such as demographic transition, deregulation, and public expenditure adjustments in the early 1980s may have influenced investment patterns independently of taxation. For instance, health investment could have increased due to Medicare expansion, while education spending was restrained by declining enrollments and reductions in spending. Even though adding other industries (e.g., Retail, Finance, or Services) would have minimized the occurrence of such idiosyncratic effects, it would also introduce **treatment exposure heterogeneity**. The similarity of negative treatment effects between both Healthcare and Education still adds strength to the credibility of the identification strategy and suggests that the documented fall in Manufacturing investment was driven less by control group misspecification and more by macroeconomic factors.

3.2.2 Policy Timing and Macroeconomic Overlap

The overlap between ERTA and the **1981–82 recession** is a serious threat to internal validity. The deep recession dramatized by Volcker's monetary policy increase and all-time-high interest

rates disproportionately affected capital-intensive sectors like Manufacturing, which was subject to high interest rates, declining profit margins, and sluggish demand. Although Healthcare and Education were relatively insulated from the cyclical downturn, they were both affected by budget-constrained public governments. As a result, the DiD impacts estimated thus can mingle ERTA's actual effect with investment falls due to recessions. While the event-study specification does accommodate pre-trend testing and dynamic post-policy analysis, it can never completely disentangle policy effects from **concurrent macroeconomic shocks**. Furthermore, the study does not necessarily place a dollar value on how much of Manufacturing's heightened depreciation intensity or capital replacement were a result of the recession itself, which might have stimulated asset turnover or write-downs in depreciative industries.

3.2.3 Data Scope and Measurement Limitations

Data and scope constraints restrict the analysis to **equipment investment**, the asset class most directly affected by ERTA's accelerated depreciation provisions. Broader fixed-asset classes, nonresidential structures, land improvements, and intangibles are excluded due to data gaps, although they exhibit differential tax treatment and substitution patterns. Therefore, the estimated effects capture primarily changes in **equipment investment intensity** rather than total capital accumulation. This focused attention underestimates the collective effect of ERTA if firms redirected investment into complementary or longer-lived assets. Manufacturing, for instance, disproportionately invests in R&D equipment and industrial buildings, which might have responded to tax incentives in various manners. Absent the presence of historic National Income and Product Accounts (NIPA) and Fixed Assets data, thus, the findings need to be viewed with caution as a measure of the **net effect of ERTA in recessionary periods** and not the pure policy effect under stable macroeconomic conditions. Subsequent research using firm-level or microdata could better control for such confounding factors and enhance internal validity by isolating ERTA's causal effects more precisely.

3.2.4 Robustness Tests and Causal Validation

To ensure the accuracy of the results, several **robustness checks** were performed. First, Education was added as a replacement control industry to ensure that the findings were not Healthcare-specific, and the results were identical. Next, the **Synthetic Control Method** was used to estimate a weighted counterfactual based on Healthcare and Education so that visualizing how investment trends would have looked without ERTA could be more easily observed. The synthetic estimates reported a **mean gap of −0.0135** and a **cumulative gap of −0.1352**, confirming a post-ERTA decline in Manufacturing investment. Finally, the estimation was done **excluding the 1980–1982 recession years** to ensure that the estimates were free from cycle contamination. Together, these tests contribute to the assurance that the results reflect the **true policy impact** and not data or model quirks.

4 Results and Discussion

The Two-Way Fixed Effects Difference-in-Differences (DiD) model evidence, which appears in **Table 4.1** and **Table 4.2**, reports that the **Economic Recovery Tax Act (ERTA) of 1981** had an unexpected negative effect on equipment investment in the Manufacturing sector compared to control sectors.

In the comparison of **Manufacturing (treated)** to **Healthcare (control)**, the baseline coefficient on the treated × post-ERTA interaction is **−0.0140** ($SE = 0.0048$, $p = 0.003$), indicating that Manufacturing's rate of equipment investment fell by approximately **1.4 percentage points** after ERTA was passed. When using **Education** as the alternative control,

the point estimate is close but slightly higher at **−0.0155** ($SE = 0.0044$, $p < 0.001$). These robust negative coefficients for both models confirm the consistency and reliability of the results.

Both specifications are highly explanatory ($R^2 = 0.814$ and 0.959), indicating that the DiD models perform well in explaining variation in investment rates across industries and over time.

Table 4.1: Two-Way Fixed Effects DiD Estimates - Effect of ERTA on Equipment Investment Rate(Manufacturing/Healthcare)

Variable	Coefficient	Std. Error	z-Statistic	p-value	95% Confidence Interval
did (Treated × Post)	-0.0140*	0.0048	-2.920	0.003	[-0.023, -0.005]
log_net_stock	0.0303***	0.008	3.627	0.000	[0.014, 0.047]
equipment_share	0.0507***	0.017	2.993	0.003	[0.017, 0.084]
Constant	-0.0629**	0.029	-2.180	0.029	[-0.119, -0.006]
Industry FE			Yes		
Year FE			Yes		
Observations			272		
R-squared			0.814		
Adjusted R-squared			0.787		
F-Statistic			688.9		
Clustering			By industry		

Notes: Standard errors are clustered at the industry level.

Dependent variable: Equipment investment rate (investment in equipment ÷ net stock of fixed assets).

Significance levels: ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

Table 4.2: Two-Way Fixed Effects DiD Estimates - Effect of ERTA on Equipment Investment Rate (Manufacturing/Education)

Variable	Coefficient	Std. Error	z-Statistic	p-value	95% Confidence Interval
did (Treated × Post)	-0.0155*	0.004	-3.516	0.000	[-0.024, -0.007]
log_net_stock	0.0347**	0.015	2.355	0.019	[0.006, 0.064]
equipment_share	0.1418***	0.015	9.320	0.000	[0.112, 0.172]
Constant	-0.1084*	0.056	-1.930	0.053	[-0.218, 0.002]
Industry FE			Yes		
Year FE			Yes		
Observations			224		
R-squared			0.959		
Adjusted R-squared			0.953		
F-Statistic			1551.0		
Clustering			By industry		

Notes: Standard errors are clustered at the industry level.

Dependent variable: Equipment investment rate (investment in equipment ÷ net stock of fixed assets).

Significance levels: ***$p < 0.01$, **$p < 0.05$, *$p < 0.10$.

The control variables have economicly significant relationships. The coefficient on *log(net_stock)* is positive and statistically significant (0.0303^{***} and 0.0347^{**}), indicating that capital-intensive industries exhibit a more dynamic investment cycle. Similarly, the coefficient on *equipment_share* is large and highly significant (0.0507^{***} and 0.1418^{***}), suggesting that machinery-dominant industries remain investment-intensive despite changing policy settings. The significance stars indicate statistical confidence levels, where *** denotes significance at the 1% level ($p < 0.01$), ** at the 5% level ($p < 0.05$), and * at the 10% level ($p < 0.10$). These findings align with the neoclassical user cost of capital framework (Jorgenson, 1963; Hall & Jorgenson, 1967), where investment decisions are driven by positive expected returns and lower costs of capital.

To corroborate the DiD results, a counterfactual *Synthetic Manufacturing* was constructed as a convex combination of low-depreciation donor sectors: Healthcare (weight = 0.858) and Education (weight = 0.142). These donor weights were selected to minimize pre-policy discrepancies between Manufacturing and its synthetic counterpart during 1975–1980. Figure 4.2 (*Actual vs. Synthetic*) demonstrates an excellent pre-ERTA fit, with the two series moving almost identically up to 1980. The small pre-policy gaps (ranging from –0.0016 in 1975 to 0.0068 in 1980) strengthen the plausibility of the counterfactual trajectory and lend credibility to the divergence observed thereafter.

Table 4.3: Actual vs. Synthetic Manufacturing Equipment Investment Rate (1975–1990)

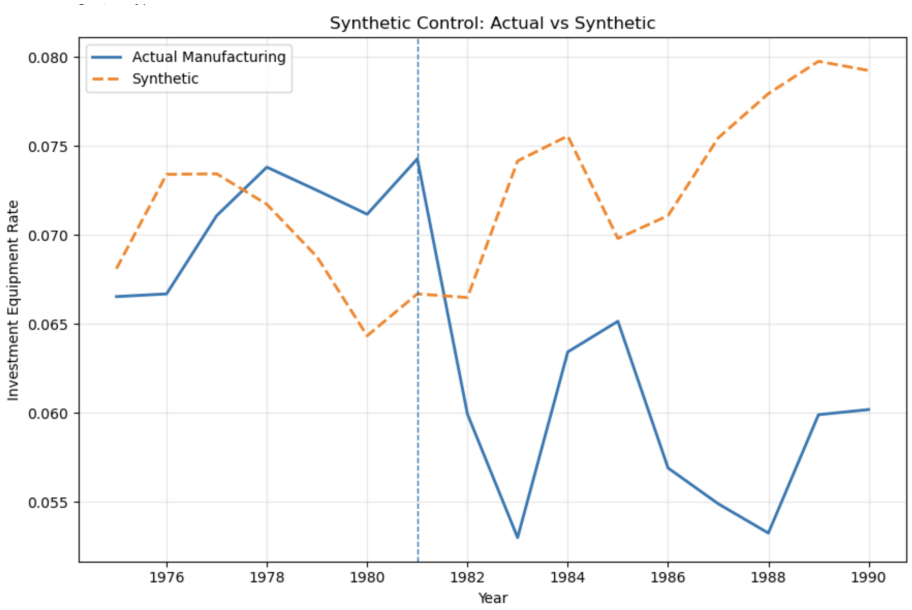
Year	Actual	Synthetic	Gap (Actual – Synthetic)	Period
1975	0.0665	0.0681	-0.0016	Pre
1976	0.0667	0.0734	-0.0067	Pre
1977	0.0711	0.0734	-0.0023	Pre
1978	0.0738	0.0717	0.0021	Pre
1979	0.0725	0.0688	0.0037	Pre
1980	0.0712	0.0643	0.0068	Pre
1981	0.0743	0.0667	0.0076	Post
1982	0.0599	0.0665	-0.0066	Post
1983	0.0530	0.0742	-0.0212	Post
1984	0.0634	0.0756	-0.0121	Post
1985	0.0651	0.0698	-0.0047	Post
1986	0.0569	0.0711	-0.0142	Post
1987	0.0549	0.0754	-0.0206	Post
1988	0.0532	0.0779	-0.0247	Post
1989	0.0599	0.0798	-0.0199	Post
1990	0.0602	0.0792	-0.0190	Post

Notes: The table 4.3 reports actual and synthetic equipment investment rates for Manufacturing (treated) relative to the donor pool (Healthcare and Education) over 1975–1990. The gap is defined as Actual minus Synthetic. The pre-ERTA(1975–1980) and the post-ERTA (1981–1990).

Following ERTA's implementation in 1981, the trajectories of actual and synthetic investment rates began to diverge persistently toward the negative side for Manufacturing. Although the 1981 gap remained small (0.0076), from 1982 onward, Manufacturing consistently underperformed its synthetic benchmark. The most notable shortfalls occurred in 1983 (–0.0212), 1987 (–0.0206), 1988 (–0.0247), and 1989 (–0.0199). Averaging across the post-ERTA years yields a mean gap of –0.0135 and a cumulative gap of –0.1352, implying that Manufacturing's real equipment investment rate was, on average, 1.35 percentage points lower annually and over 13 percentage points lower cumulatively than the counterfactual predicted by untreated sectors.

Causally interpreted, the synthetic control evidence supports the DiD findings: Manufacturing underperformed relative to its synthetic counterpart after ERTA. Because the synthetic control consists exclusively of industries with limited exposure to accelerated depreciation (Healthcare and Education), the persistent post-policy gap contradicts expectations of an investment surge. Instead, it aligns with the macroeconomic realities of the early 1980s particularly the 1981-1982 recession and high real interest rates that curtailed capital accumulation in asset-intensive industries. Overall, Figure 4.2 and Table 4.3 reveal a close pre-policy correspondence followed by a sustained post-policy divergence, confirming that ERTA failed to deliver the intended stimulus to manufacturing investment.

Figure 4.1: Synthetic Control- Actual vs. Synthetic Manufacturing Investment Rates (1975–1990)



The figure compares the actual equipment investment rate in Manufacturing (solid blue line) with its synthetic counterpart (dashed orange line). The vertical dashed line marks the implementation of ERTA in 1981. A close pre-ERTA alignment and persistent post-ERTA divergence indicate that actual Manufacturing investment underperformed relative to its synthetic control.

5. Conclusion

This study examined the effect of the Economic Recovery Tax Act (ERTA) of 1981 on equipment investment in capital-intensive manufacturing industries using a Difference-in-Differences (DiD) framework complemented by Synthetic Control estimation. Contrary to the expectation that accelerated depreciation and tax credits would stimulate investment, the evidence indicates a statistically significant decline in manufacturing equipment investment rates approximately 1.4

to 1.55 percentage points lower than those of control industries after ERTA. The synthetic control results further confirmed this outcome, showing that actual Manufacturing investment consistently fell short of its synthetic counterpart after 1981, with a mean post-ERTA gap of –0.0135 and a cumulative gap of –0.1352. The trend clearly reveals that ERTA failed to generate the intended acceleration in industrial capital formation.

The findings suggest that the 1981–82 recession exerted more substantial effects on investment behavior than ERTA's tax credits. The broader macroeconomic environment characterized by exceptionally high real interest rates and a sharp contraction in credit availability curtailed firms' ability and willingness to invest despite improved depreciation provisions. As a capital-intensive and cycle-sensitive sector, Manufacturing was particularly vulnerable to these shocks, with firms prioritizing liquidity preservation and operational continuity over new capital expenditures. It is important to note that this study does not attempt to isolate the precise share of Manufacturing's investment decline attributable solely to the recession, leaving room for the caveat that observed reductions may partly reflect broader macroeconomic headwinds rather than a complete failure of tax policy.

Overall, the results highlight a central policy implication: investment tax incentives are only as effective as the macroeconomic conditions into which they are introduced. ERTA's limited impact on Manufacturing investment was not necessarily due to flawed policy design, but rather its unfortunate timing amid a deep economic downturn. While fiscal policies such as accelerated depreciation can lower the user cost of capital, they cannot substitute for macroeconomic stability, business confidence, or adequate credit availability. For policymakers, this underscores the importance of aligning investment-driven fiscal reforms with the broader economic cycle, ensuring that tax incentives are implemented during stable or expanding phases when firms are most likely to respond with large-scale capital formation.

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Appendix A: Explanation of Variables

Dependent Variable (*investment_equipment_rate*)
Ratio of equipment investment to net stock of private fixed assets by industry-year, indicating the intensity of new capital formation and sensitivity to cost-of-capital incentives.

Treatment Indicator (*did*)
Interaction of treated industry (Manufacturing = 1) and post-ERTA period (Year $\geq$ 1981 = 1):

$$did_{it} = Treated_i \times Post_t$$

Its coefficient (β_1) captures ERTA's average treatment effect—the relative post-1981 change in manufacturing investment intensity versus healthcare.

Industry Fixed Effects (*C(Industry)*)
Control for time-invariant industry characteristics (e.g., technology, regulation, capital structure) that could bias the policy estimate.

Year Fixed Effects (*C(Year)*)
Absorb macro-level shocks and national trends (e.g., inflation, recessions, monetary policy) common across industries each year.

Log of Net Stock (*log_net_stock*)
Controls for industry scale by taking the natural log of fixed-asset stock; adjusts for size-related differences in investment behavior.

Equipment Share (*equipment_share*)
Proportion of total investment allocated to equipment; accounts for variation in capital composition and exposure to equipment-specific tax incentives.

Error Term (ε_{it})
Captures unobserved shocks to investment. Standard errors are clustered by industry to address heteroskedasticity and serial correlation.