The Effect of Federal Depreciation provisions on the Employment and Capital Expenditures at the State Level.

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Abstract:
During the last decade the federal government has implemented several policies designed to stimulate investment and employment. Three such provisions represent 3 of the 5 largest corporate tax expenditures in the federal tax code. These three provisions are the Bonus Depreciation deduction, the Section 179 expensing provision, and the Section 199 Domestic Production Activities deduction. These provisions have expanded in scope over time at the federal level. Adoption of these provisions at the state level due to the practice of conforming the state tax code to the federal code becomes more expensive in terms of lost revenue to the state. This research attempts to determine the extent to which states that adopt these provisions experience economic gains compared to those states that do not and also to compare the extent of these gains to the cost of lost state tax revenue.

JEL Classification: H25, H71, H73

Keywords: bonus depreciation, state and federal tax conformity, capital depreciation deduction

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Introduction

This paper explores the effect of the various federal depreciation provisions on capital expenditures and employment at the state level. Since the early 2000s the federal government has implemented various depreciation provisions to encourage the purchase of capital expenditures by firms which is ultimately designed to encourage additional employment in the economy. Three of the largest of these provisions include the additional first year bonus depreciation deduction, the deduction for domestic production activities (section 199), and the ongoing but expanding section 179 deduction capital expenditures. Although many states automatically adopt these federal provisions, many states do not. In several states these provisions have not been incorporated into their state tax income code at all and several other states have adopted these provisions on a less generous scale. The different practices in conformity create a national environment of varying returns for capital investment. Firms that operate in states that conform to the federal provisions may face a lower cost of capital before the state tax rate is applied and will face a lower administrative cost because they do not need separate depreciation schedules compared to firms operating in states that do not conform or conform in an incomplete manner.

This research tests the hypothesis that conforming states benefit in terms of increased capital expenditures and increased manufacturing employment compared to states that do not conform to these federal provisions. Using state level data for 2000-2011 on capital expenditures from the Annual Survey of Manufactures and data collected on state tax rates, apportionment rates, and annual conformity practices for bonus depreciation, the domestic production activities deduction, and section 179 deduction, preliminary results indicate that manufacturing firms located in states that allowed the federal bonus depreciation deductions at the state level, had significantly higher capital expenditures than firms located in states that did not adopt the federal provisions. While the effect is significant when considered for total capital expenditures, the result becomes more robust when considering capital expenditures other than automobiles and computers. For this category of capital expenditures, the analysis finds a significant and positive effect of state adoption on the level of capital expenditures. On the other hand, this research finds no evidence that state adoption of the federal bonus depreciation provisions was a significant positive determinant of state manufacturing employment and no evidence that

adoption of section 179 depreciation provisions or section 199 provisions have an effect on capital expenditures at the state level.

Background

Bonus Depreciation

In 2002, federal legislation titled the Job Creation and Worker Assistance Act (JCWAA) included a significant provision designed to stimulate business investment and economic recovery, bonus depreciation. The JCWAA bonus depreciation provision allowed firms to take an additional 30 percent depreciation deduction in the first year for qualified capital purchases. The remaining asset value was then depreciated according to the standard MACRS schedule. For example under the standard depreciation rules, an asset worth $1,000 with a life of 5 years would have a first year depreciation amount of $200. Under the bonus depreciation rules, the first year depreciation was equal to $300 (30% of $1,000) plus 20 percent of the remaining $700 or $140 for a total first year deduction of $440. The deduction was allowed against regular income tax liability and the alternative minimum tax (AMT). Under the 2002 provision qualified investments included new (not used) property with a recovery period of 20 years[1] or less and must have been acquired between 9/11/2001 and 9/11/2004.[2]

The Jobs and Growth Tax Relief Reconciliation Act (JGTRRA) of 2003 increased the first year bonus depreciation from 30 percent to 50 percent for qualified property. Eligible capital purchases under JGTRRA must have been placed in service by January 1, 2005.[3] The American Jobs Creation Act (AJCA) for 2004 broadened the bonus depreciation provision to include certain leasehold improvements and qualified restaurant property. The Economic Stimulus Act (ESA) of 2008 allowed a 50 percent deduction for qualifying purchases occurring in 2008. The American Recovery and Reinvestment Act (ARRA) of 2009 extended the first year 50 percent deduction provision through 2009 and the Small Business Jobs Act (SBJA) of 2010 extended it again through 2010. The Tax Relief, Unemployment Insurance Reauthorization and Job

[1] In addition, certain water utility property as defined by I.R.C. section 168(e)(5) qualified for this treatment as did certain computer software defined in I.R.C. section 197.

[2] Property must have been placed in service by the end of 2004, though an extension was allowed for certain property with a recovery period of 10 more years.

[3] The 2005 extension for certain assets with a recovery period of 10 or more years was extended to the end of 2006.

Creation Act (2010 Tax Relief Act) of 2010 both extended and expanded the bonus depreciation provision. Under this act, the first year depreciation deduction was equal to 100 percent for qualified property placed in service on or after 9/8/2010 and before 1/1/2012. For property placed in service after 2011 and before 2013, an additional 50 percent deduction was allowed. The American Taxpayer Relief Act (ATRA) of 2012 extended the 50 percent deduction for qualified property placed in service in 2013.[4]

Deduction for Domestic Production Activities

First enacted as part of AJCA of 2004, this deduction was equal to 3 percent of the lesser of the taxpayer's taxable income or its qualified production activities income for tax years 2005 and 2006.[5] For years 2007, 2008, and 2009, the deduction was equal to 6 percent and for years after 2009, the deduction is equal to 9 percent. In general, qualified production activities income is equal to domestic production gross receipts less the cost of goods sold that are associated with such receipts and less other deductions, expenses, and losses that are directly associated with such receipts, and less the proper share of other deduction, expenses, and losses that are indirectly associated with such receipts. In general, domestic production gross receipts are defined in the IRC code as gross receipts derived from the sale, exchange, lease, or rental of qualifying production property that was manufactured, produced, grown or extracted by the taxpayer within the U.S.. Domestic production gross receipts may also include income from sale of qualified films produced by the taxpayer in the U.S., electricity, natural gas, potable water produced by the taxpayer in the U.S., construction activities within the U.S., or engineering or architectural services performed in the US..

Section 179 depreciation deduction

Originally enacted in 1958 as a small business depreciation provision, section 179 has been modified and expanded significantly over the years. Originally, the deduction allowed an additional first year depreciation of 20 percent the cost of depreciable property of no more than $10,000 for a maximum annual deduction of $2,000. With the adoption of the ACRS

[4] This extension allowed for property placed in service by 2014 for some qualifying assets.
[5] A taxpayer's section 199 deduction may not exceed 50 percent of the wages associated with the domestic production gross receipts for that calendar year.

depreciation rules in 1981, the provision was further modified to allow for expensing up to higher and higher dollar limits and in time a phase-out of the deduction was implemented as the asset value exceeded a stated threshold. By 1993, the dollar limitation had risen from $10,000 to $17,500. The limitation was raised several times during the nineties and by 2003 was equal to $25,000. The limitation was increased again to $100,000 for years 2003 through 2006. The limit was $125,000 in 2007 and $250,000 for years 2008 and 2009. For years 2010 and 2011, the limit was $500,000 and was $125,000 for 2012. Beside the different limits applied to section 179 property, this deduction can be applied to used property while the bonus depreciation deduction can only be applied to new property.

Table 1. State Adoption of Federal Provisions for 2013

State	Bonus Depreciation Conformity	Section 179 Conformity	Section 199 Conformity
Alabama	1	1	1
Alaska	2	1	1
Arizona	0	0	1
Arkansas	0	0	0
California	0	0	0
Colorado	1	1	1
Connecticut	2	1	0
Delaware	1	1	1
Florida	2	2	1
Georgia	0	2	0
Idaho	0	1	1
Illinois	2	1	1
Indiana	0	0	0
Iowa	0	1	1
Kansas	1	1	1
Kentucky	0	0	2
Louisiana	1	1	1
Maine	2	1	0
Maryland	0	0	0
Massachusetts	0	1	0
Michigan	0	1	0
Minnesota	2	0	0
Mississippi	0	1	0
Missouri	1	1	1
Montana	1	1	1
Nebraska	1	1	1
New Jersey	0	0	0
New York	0	1	0
North Carolina	2		0
North Dakota	1	1	0
Ohio	2		1
Oklahoma	2	1	1
Oregon	1	1	0
Pennsylvania	2	1	1
Rhode Island	0	0	1
South Carolina	0	1	0
Tennessee	0	1	0
Texas	0	0	0
Utah	1	1	1
Vermont	0	1	1
Virginia	0	1	2
West Virginia	1	1	0
Wisconsin	0	0	0

Notes -

0 means no conformity

1 means full conformity

2 means incomplete or partial conformity

States coded as a 0 for the Section 179 provision may allow the deduction based on the pre-1996 schedule.

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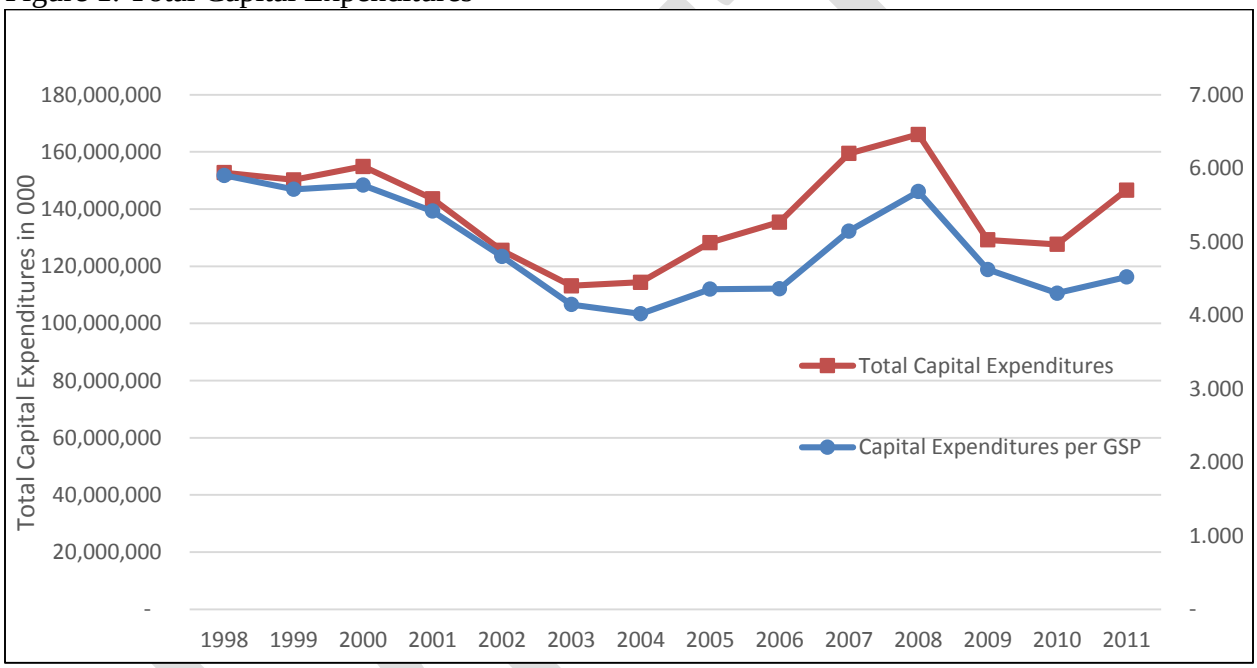
State and National Effect of Depreciation and Manufacturing Provisions

Nationally, the pattern of capital expenditures by manufacturing firms follows the pattern of gross state product. Figure 1 shows total capital expenditures nationally using the Annual Survey of Manufacturers for all states combined. Measured on the right side axis is the ratio of capital expenditures by manufacturing firms to the total gross state product from manufacturing. The total expenditure patterns rise slightly prior to the future upturns in gross state product but in general both follow the pattern of general changes in the economy.

Figure 1. Total Capital Expenditures



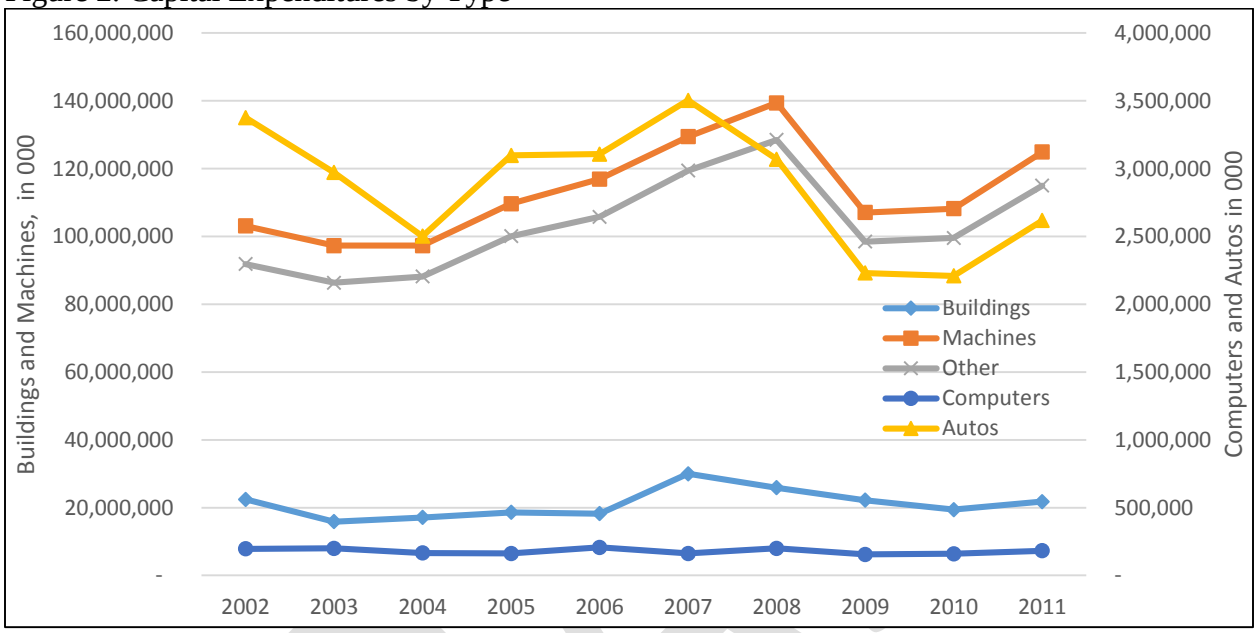
Source: Author's calculations of data from Annual Survey of Manufacturing.

Figure 2 breaks out total capital expenditures by manufacturing firms into the categories of buildings, machines, including computers, other equipment, and automobiles, where computers and automobiles are measured by the axis on the right.[6] Expenditures for building construction make up a much smaller share of total capital expenditure and have been somewhat constant over the 2002-2011 period. On the other hand, capital expenditures on machines, including computers, other equipment, and automobiles follow a pattern consistent with total capital expenditures in Figure 1. Figure 3 provides a breakdown of capital expenditures by the

[6] The category of other equipment is measured on the left side axis due to its size.

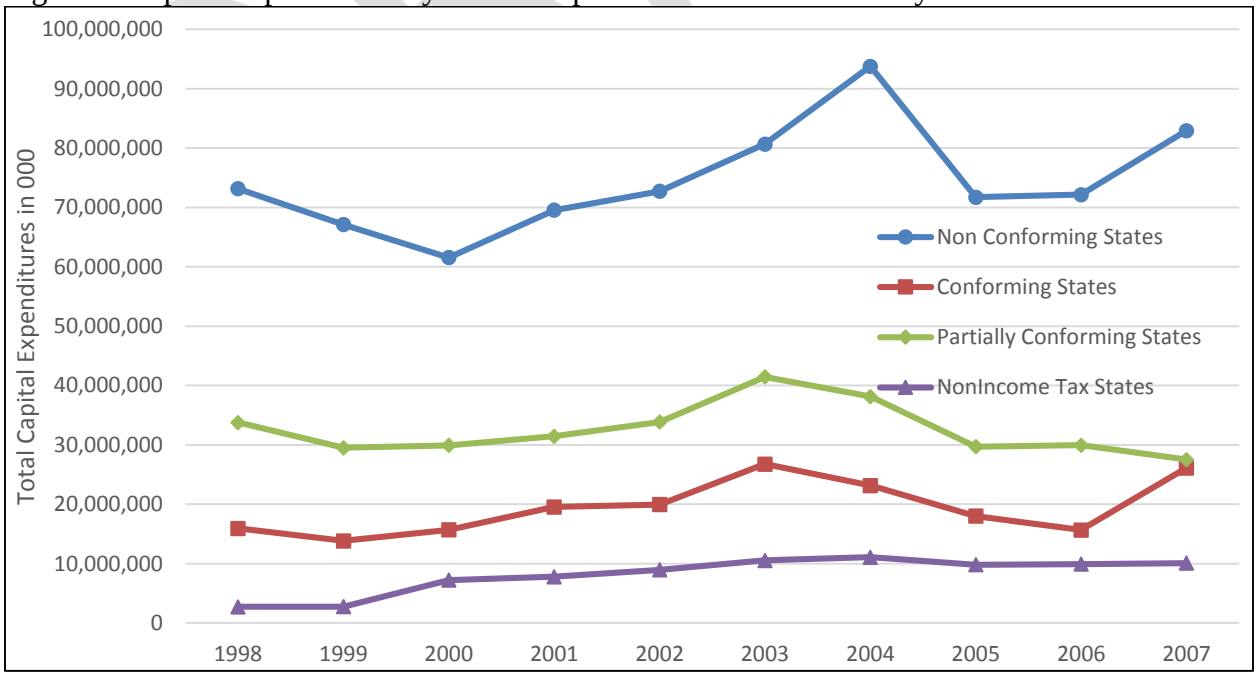
conformity status of each state. Note that neither Texas nor California conform to the bonus depreciation provisions which explains to some degree the higher level of capital expenditures for nonconforming states.

Figure 2. Capital Expenditures by Type



Source: Author's calculations of data from Annual Survey of Manufacturing.

Figure 3. Capital Expenditures by Bonus Depreciation State Conformity



Source: Author's calculations of data from Annual Survey of Manufacturing.

Existing Literature

The empirical literature on the effect on bonus depreciation is fairly limited and research on the effect of section 179 or section 199 deduction seems even more sparse. Only two papers explicitly consider the effects of bonus depreciation. House and Shapiro (2008) consider the effect of bonus depreciation on the elasticity of investment supply and on the market price of investment capital. Their work found a significantly elastic supply, with elasticity estimates in the range of 6 to 14, and little evidence of an increase in the market price for capital due to the presence of the subsidy. In addition, their work revealed a sharp increase in the consumption of capital that benefitted most from the tax provisions, i.e. long-lived assets. Knittel (2007) uses firm level data to determine the extent to which the 2002-2003 provisions were utilized by C and S corporations. While this research shows that the provisions were used, they were not used to the maximum extent allowable. The author found evidence of C corp utilization equal to about 60 percent and about 70 percent in the case of S corps. Furthermore, the author found only a weak correlation between bonus depreciation utilization and investment classes based on age and some evidence that industries dominated by larger firms had greater utilization than industries with a majority of smaller firms.

Faulk (2002) tests a similar idea using data on the Georgia Jobs Tax credit. This work tests the effectiveness of tax credits in creating new employment in the state. Conclusions based on this research indicate that eligible firms utilizing the credit created about 25 percent more jobs than eligible firms not taking the credit but also found that the state spent over $3 million to subsidize employment that would have been created in the absence of the subsidy. Chirinko and Wilson (2008), using a 20 year panel of state level investment incentives, find that state level tax prices are an important determinant in the level of capital in a state. At the same time, this work finds no evidence that difference in state prices affect capital consumption at a national level, indicating that relatively high-incentive states poach capital from lower-incentive states. Hansen and Rohlin (2011) consider the effect of local tax incentives for empowerment zones on local economic development. This research finds a positive effect between tax wage tax credit and the number of establishments locating in an area. Patrick (2012) considers the effect of state non tax capital subsidies on the amount of manufacturing employment and capital expenditures in a state. The research employs a unique index of nontax incentives developed by the author. This index

coupled with other county control variables find that increases in capital subsidies have significant effects on the county industry mix and the capital-labor ratio within a state. The research presented below adds to this body of literature in that it considers the state level effects of adopting these federal depreciation and capital expenditure provisions on employment and future investment in the manufacturing sector of the economy.

Model

The basic estimation model is shown in Equation 1 and 2. Because some states conform to the federal provisions and some do not, this can be thought of as a natural experiment, using a dummy variable to capture the effects of conformity. In Equation 1, it is hypothesized that adopting states have increased capital expenditures by estimating a simple two-way fixed-effects model with a dummy variable equal to 1 if the state adopted the federal provisions in some capacity. Thus, those states that partially adopted the federal provisions were coded as if they had full adoption. Each provision, bonus depreciation, section 179 deduction, and the section 199 deduction is included in a separate model. In later versions of this work, a more elaborate modelling is planned to test for the cumulative effect of adopting all three provisions or the marginal effects of adopting more than one but not all of these provisions. In this draft of the research, the main emphasis is on the effect of adopting the bonus depreciation provision. Therefore, most of the discussion below will focus on the influence of that variable.

The first key coefficient is the coefficient for the bonus depreciation dummy, β_2. A positive coefficient indicates a positive effect of bonus depreciation on capital expenditures in the state. The second important coefficient is the coefficient on the interaction term of the depreciation treatment and the state corporate income tax (SCIT) rate, β_3. This term captures the interactive effect of state corporate tax rates and the depreciation treatment. A significant positive coefficient indicates that states with higher tax rates also receive a larger benefit from the bonus depreciation adoption.

$$Capital\ Expenditures_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 conformity\ status_{i,t} + \beta_3 (conformity\ status * SCIT)_{i,t} + e_{i,t} \qquad Equation\ 1$$

$$Manufacturing\ Employment_{i,t} = \beta_0 + \beta_1 Z_{i,t} + \beta_2 conformity\ status_{i,t} + \beta_3 (conformity\ status * SCIT)_{i,t} + e_{i,t} \qquad Equation\ 2$$

where:

total capital expenditures$_{i,t}$ represents expenditures in state i in time t

manufacturing employment$_{i,t}$ represents expenditures in state i in time t

X and Z are vectors of control variables including population, gross state product, state unemployment rate, maximum corporate income tax rate, the sales factor apportionment rate, and manufacturing value-added.

Data

Data from the Census Bureau Annual Survey of Manufactures and Census of Manufactures identifies the total value of capital expenditures by state along with employment, value-added[7], and the average number of production workers for manufacturing firms. Data on state personal income and gross state product is obtained from the Bureau of Economic Analysis. Data for state unemployment rates is from the Bureau of Labor Statistics. In addition, state corporate tax rates are available from the Tax Foundation. In the case where a state has multiple rates, the maximum rate was used. Information on the states' conformity to the federal bonus depreciation, section 199 and section 179 provisions are from several sources. The primary source was state tax returns and instructions available on state department of revenue websites. State population was obtained from the U.S. Census Bureau. The time series on state apportionment factors was collected from state tax return instructions available on state department of revenue websites and from the Federation of Tax Administrators website.

[7] Value added is a measure of manufacturing activity net of expenses on inputs such as cost of materials, fuels, and supplies.

Table 2. Data Sources.

Variable	Source
Capital Expenditures, Manufacturing Employment, and Value-added by manufacturing firms	Census Bureau Annual Survey of Manufactures for years 1998-2001 & 2003-2006 & 2008-2011 and 2002 & 2007 Economic Census
Maximum corporate tax rate	Tax Foundation 2000-2011
Maximum individual rate	Tax Foundation 2000-2011
Bonus depreciation adoption status	CCH Tax Briefing, Bloomberg BNA, state corporate tax forms and department of revenue publications 2002-2011
State corporate income tax apportionment rates	State personal and corporate tax forms and department of revenue publications 1998-2011
Section 179 adoption status	State personal and corporate tax form and state department of revenue forms 1998-2011
Section 199 adoption status	State corporate tax form and state department of revenue forms 2005-2011
Personal income and Gross state product	Bureau of Economic Analysis 1998-2011
Unemployment rate	Bureau of Labor Statistics 1998-2011
State population	U.S. Census 1998-2011

46 states were included over the 2002-2011 period. Nevada, South Dakota, and Wyoming were dropped from the sample because the state imposes no corporate or personal income tax. Washington State was also eliminated because imposes a nonstandard corporate income tax. The District of Columbia was not included in the analysis. The means and general data statistics are given in Table 3 for the states included in the analysis.

Table 3. General Descriptive Statistics, All observations, 2002-2011

Variable Name	# of observations	Mean	Standard Deviation	Minimum	Maximum
Capital Expenditures	460	2,848,632	3,011,289	50,680	18,201,303
Manufacturing Employment	460	267,198	262,825.4	10,349	1,616,504
Value-added	460	45,240,745	45,705,659	1,217,728	249,954,328
Maximum corporate tax rate	459	7.147	2.089	0	12

Maximum individual tax rate	460	6.140	2.4278	0	11
Bonus depreciation conformity status (0/1)	460	0.4956522	0.5005254	0	1
Section 179 conformity status (0/1)	460	0.6891304	0.4633534	0	1
Section 199 conformity (0/1)	322	0.5434783	0.4988813	0	1
Gross State Product	460	36,405	40,654	968.000	243,846
Population	460	6,280,668	6,744,997	615,442	37,668,681
Unemployment rate	460	6.043	2.079	2.500	13.500

Results

The results of the estimation of Equation 1 are shown in Tables 4A-4C. In Table 4A the dependent variable is total capital expenditures for manufacturing firms. It is important to understand that the capital expenditure variable available from the Annual survey of Manufacturers captures new and used capital expenditures, while the bonus depreciation deduction is only applicable to purchases of new capital machinery and equipment. All of the independent variables are lagged one year. The variables indicating the state corporate income tax (SCIT) rate is lagged to reduce the concern that this variable is endogenous to the model. The other variables are lagged to reflect the hypothesis that future capital expenditures follow behind changes in these variables. The effect of a state's conformity of the federal bonus depreciation provision is captured by the dummy variable BD Adoption, which takes on a value equal to 1 if the state adopted the federal provision either completely or partially. This variable takes on the value of zero, otherwise.

Model 4A performs fairly well in regards to the bonus depreciation variable. The adoption dummy variable is positive and significant indicating that adoption of the bonus depreciation provision is associated with an increase in capital expenditures at the state level. The coefficients on the unemployment rate and value-added variables are significant and of the

expected sign. The coefficient on the population is negative and coefficient on gross state product variable is positive but neither are significant. The coefficient on the sales apportionment factor is positive but insignificant. The coefficient on the maximum corporate tax rate is borderline significant but with a counterintuitive positive sign, indicating that firms located in states with higher corporate tax rates have larger capital expenditures.

Table 4A. Equation 1 – Effect on Total Capital Expenditures

	Dependent variable=Total capital expenditures
Intercept	323.5 (0.43)
GSP (lagged)	-0.0111 (-1.26)
Unemployment rate (lagged)	-119.05 (-3.30) ***
Population (lagged)	-0.03001 (-0.27)
SCIT*BD Adopt	-72.1417 (-1.85)
Value-Added (lagged)	0.070532 (8.30) ***
BD Adoption dummy	763.114 (2.26) ***
SCIT (lagged)	73.92186 (1.92)
Sales Factor (lagged)	2.953069 (1.05)
	R-Square=0.9722 N=503

t values are shown in parentheses.

Model 4A also contains an interactive term, the bonus depreciation dummy interacted with the maximum state corporate income tax rate. The coefficient on this variable is negative but insignificant.

In Model 4B, the same independent variables are used but the dependent variable is broken down by type of capital expenditures, expenditures for machinery and equipment and expenditures for buildings. While the buildings expenditures model performs worse overall, the machinery and equipment model performs as well as Model 4A. In addition, the bonus depreciation dummy variable is significant in the case of capital expenditures on machinery and equipment but not in the case of capital expenditures on buildings. This is not unexpected, since buildings have a life

in excess of 20 years and the bonus depreciation allowance only applies to capital expenditures with a life of 20 years or less.

Table 4B. Equation 1 – Effect by Type of Expenditure

	Dependent variable=Capital expenditures on Machinery	**Dependent variable=Capital expenditures on Buildings**
Intercept	-557.803 (-0.92)	879.6473 (2.56) ***
GSP (lagged)	-0.00564 (-0.80)	-0.00549 (-1.38)
Unemployment rate (lagged)	-111.208 (-3.84)	-7.77868 (-0.48)
Population (lagged)	0.222112 (2.49) ***	-0.25216 (-5.00) ***
SCIT*BD Adopt	-62.1405 (-1.98) ***	-10.1455 (-0.57)
Value-Added (lagged)	0.048665 (7.14) ***	0.021901 (5.68) ***
BD Adoption dummy	624.2925 (2.31) ***	138.8889 (0.91)
SCIT (lagged)	83.93487 (2.71) ***	-10.0486 (-0.57)
Sales Factor (lagged)	1.171212 (0.52)	1.789593 (1.41)
	R-Square=0.9743 N=506	R-Square=0.8438 N=506

t values are shown in parentheses.

The interactive term is significant and negative in the model for machinery and equipment but not significant for the buildings model. Note also that population is significant in both equations but positive in the machinery and equipment model and negative in the buildings model. When combined as total capital expenditures in Table 4A, this coefficient was much smaller and not significant, probably due to the counteracting effects from both of these types of capital expenditures.

Model 1C further specifies the type of machinery and equipment capital expenditure. Again, the same independent variables are used but the type of capital expenditure on machinery and equipment is broken down by expenditures on automobiles, computers, and other equipment. Data for these variables is available for 2002-2011. In this case, the analysis finds that the bonus depreciation dummy variable is a significant and positive determinant in the case of capital expenditures on other equipment and machinery but insignificant in the case of expenditures on

autos and computers. Furthermore, the coefficient on the interactive variable, SCIT*BD Adoption, is negative and significant for expenditures on other equipment and insignificant otherwise. This variable is interpreted to mean that the incremental effect of a state's conformity to the federal provision diminishes as the state corporate tax rate increases.

Table 4C. Equation 1 – Effects by Type of Machinery and Equipment Expenditure

	Dependent variable=Capital expenditures on Autos	**Dependent variable=Capital expenditures on Computers**	**Dependent variable=Capital expenditures on Other Equipment**
Intercept	109.9116 (2.95)***	269.7163 (3.36)***	-2055.09 (-3.00)***
GSP (lagged)	-0.00121 (-3.08)***	0.001096 (1.29)	-0.00855 (-1.17)
Unemployment rate (lagged)	-5.22796 (-3.14)***	-8.223 (-2.28)***	-87.2674 (-2.83)***
Population (lagged)	-0.00976 (-1.73)	0.006783 (0.56)	0.398207 (3.82)***
SCIT*BD Adopt	-1.09139 (-0.51)	0.51196 (0.11)	-95.1837 (-2.38)***
Value-Added (lagged)	0.001569 (4.21)***	-0.00084 (-1.04)	0.047543 (6.87)***
BD Adoption dummy	5.600231 (0.28)	13.2376 (0.31)	910.73 (2.46)***
SCIT (lagged)	1.722695 (0.88)	-4.16803 (-0.97)	106.617 (2.91)***
Sales Factor (lagged)	0.086619 (0.68)	0.519032 (1.89)	1.404487 (0.61)
	R-Square=0.8924 N=460	R-Square=0.9428 N=460	R-Square=0.9706 N=460

t values are shown in parentheses.

Based on the coefficients estimated in this model, states with a maximum corporate tax rate above 9.57 percent do not find any advantage in the state conformity with the bonus depreciation provision.[8]

In addition to increases in capital expenditures, the aim of the federal bonus depreciation was ultimately to increase employment. Likewise, state conformity to this provision was adopted

[8] This rate is calculated as the ratio of the coefficient on BD Adoption over SCIT*BD Adoption, ie. 910.73/95.1837=9.57.

with this result as the ultimate goal. Results from the estimation of Equation 2 are shown in Table 5. In this model, the dependent variable is total manufacturing employment and the manufacturing employment associated directly with production activities. Both models in Table 5 show unexpected results. The coefficient on GSP is negative and significant, as is the coefficient for population. Both of these variables are expected to have positive signs on the coefficient. The coefficients for the unemployment rate and value added variables continue to have the expected signs and are consistent with the past regression model results. Neither the tax rate nor the sales apportionment factor are found to be significant, though the coefficients are negative. The bonus depreciation dummy is negative and significant for each model, indicating that states which adopted the bonus depreciation provisions have lower manufacturing employment. With employment as the dependent variable, the interactive term becomes positive, indicating that the effect of bonus depreciation adoption has a greater effect on employment as the corporate tax rate increases.

Table 5. Equation 2 – Effects on Manufacturing Employment

	Dependent variable=# of Production workers	**Dependent variable=# of all workers**
Intercept	557.0241 (16.64) ***	759.4905 (16.97) ***
GSP (lagged)	-0.00176 (-4.94) ***	-0.00284 (-5.97) ***
Unemployment rate (lagged)	-11.7242 (-7.78) ***	-15.4157 (-7.65) ***
Population (lagged)	-0.02835 (-5.58) ***	-0.04125 (-6.07) ***
SCIT*BD Adopt	4.891091 (2.50) ***	5.519546 (2.11) ***
Value-Added (lagged)	0.002004 (5.94) ***	0.003132 (6.94) ***
BD Adoption dummy	-45.8702 (-2.53) ***	-53.9309 (-2.23) ***
SCIT (lagged)	-2.55862 (-1.43)	-2.30404 (-0.96)
Sales Factor (lagged)	-0.17569 (-1.56)	-0.24106 (-1.60)
	R-Square=0.9881 N=460	R-Square=0.9903 N=460

t values are shown in parentheses.

The results shown in Table 6 are for Equation 1 with the section 179 and section 199 deduction dummies substituted for the bonus depreciation dummy. The results show no support for the

adoption of the section 179 or section 199 deduction in terms of greater capital expenditures. While the coefficients on the unemployment rate and value added continue to exhibit the consistent and significant signs, all the other variables are found to be insignificant in terms of describing total capital expenditures.

Table 6. Equation 1 – Effects of Section 179 and Section 199 Conformity

	Dependent variable=Total Capital Expenditures (Section 179)	**Dependent variable=Total Capital Expenditures (Section 199)**
Intercept	995.3131 (1.27)	203.2037 (0.15)
GSP (lagged)	-0.01051 (-1.16)	-0.00937 (-0.72)
Unemployment rate (lagged)	-122.041 (-3.37) ***	-148.133 (-3.23) ***
Population (lagged)	-0.04203 (-0.37)	0.32318 (1.60)
SCIT*Sec179Adopt	70.70108 (1.35)	-109.012 (-1.45)
Value-Added (lagged)	0.070926 (8.14) ***	0.047702 (4.13) ***
Sec179 Adoption dummy / Sec199 Adoption dummy	66.02221 (0.21)	303.094 (0.55)
SCIT (lagged)	1.295465 (0.04)	124.5139 (1.66)
Sales Factor (lagged)	2.167805 (0.77)	0.465477 (0.12)
	R-Square=0.9721 N=460	R-Square=0.9761 N=322

t values are shown in parentheses.

Conclusion

The bonus depreciation provisions were generous investment provisions designed to encourage capital investment by corporations in hopes of staving off a deeper recession. While not as generous, the section 179 provision and the section 199 provision provided additional deductions for investment in manufacturing equipment and manufacturing activities. Although firms were able to utilize these provisions on their federal returns, several states also conformed their income tax systems to allow one or all of these provisions to also be taken at the state level. By conforming to the federal treatment, states were able to reduce the cost of capital relative to other states and relative to its previous own-state price.

This paper used data on capital expenditures by state from the U.S. Annual Survey of Manufactures, combined with additional data to capture special characteristics of states to test the hypothesis that capital expenditures by manufacturing firms were significantly higher in states that adopted the federal provisions than the non-adopting states. In addition, this research tests the effect of bonus depreciation adoption, section 179 adoption and section 199 adoption at the state level on the level of future manufacturing employment in the state.

The results indicate that manufacturing firms located in states that allowed the federal bonus depreciation deductions at the state level, had significantly higher capital expenditures than firms located in states that did not adopt the federal provisions. While the effect is significant when considered for total capital expenditures, the result becomes more robust when considering capital expenditures other than automobiles and computers. For this category of capital expenditures, the analysis finds a significant and positive effect of state adoption on the level of expenditures. On the other hand, this research finds no evidence that state adoption of the federal bonus depreciation provisions was a significant positive determinant of state manufacturing employment and no evidence that adoption of section 179 depreciation provisions or section 199 provisions had an effect on capital expenditures at the state level.

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