Appendices for Online Publication

A Data

A.1 Tax Base Rules

1. Throwback Rules
   - Variable: throwback
   - Source: Bernthal et al. (2012)
   - Definition: Indicator for whether state eliminates "nowhere income" that would be untaxed by either the state with the corporation's nexus or the state in which the relevant sales were being made.
2. Combined Reporting Rules
   - Variable: combined
   - Source: Bernthal et al. (2012)
   - Definition: Indicator for whether a state requires a unitary business to submit combined reporting.
3. Investment Tax Credit
   - Variable: investment_credit
   - Source: Chirinko and Wilson (2008)
   - Definition: Rate of investment tax credit for a given state-year.
4. Research and Development Tax Credit
   - Variable: rec_val
   - Source: Dan Wilson (2009)
   - Definition: Statutory credit rate adjusted for recapture and type of credit.
5. Research and Development Tax Credit Base: Incremental Fixed Period
   - Variable: incr_fixed
   - Source: Computed using data from Dan Wilson (2009)
   - Definition: Indicator for whether the tax base is incremental with a fixed base. See Appendix A.3 for more details.
6. Research and Development Tax Credit Base: Incremental Moving Average
   - Variable: incr_ma
   - Source: Computed using data from Dan Wilson (2009)
   - Definition: Indicator for whether the tax base is incremental with a moving average. See Appendix A.3 for more details.
7. Loss Carryback Rules
   - Variable: Losscarryback
   - Source: CCH (1980 - 2010)
   - Definition: Number of years prior to the loss year that a corporation may carry back net operating loss.
8. Loss Carryforward Rules
   - Variable: Losscarryforward
   - Source: CCH (1980 - 2010)

- Definition: Number of years a corporation may carry forward any excess loss following the loss year.

9. Franchise Tax (indicator)
    - Variable: FranchiseTax
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not a Franchise tax is levied on corporations in a given state-year.
10. Federal Income Tax Deductible
    - Variable: FedIncomeTaxDeductible
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not federal income tax is deductible in a given state-year.
11. Federal Income as State Tax Base
    - Variable: FederalIncomeasStateTaxBase
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not federal income is used as the state tax base in a given state-year.
12. Federal Accelerated Depreciation
    - Variable: AllowFedAccDep
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not federal accelerated depreciation is allowed in a given state-year.
13. Accelerated Cost Recovery System (ACRS) Depreciation
    - Variable: ACRSDepreciation
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not ACRS is allowed in a given state-year.
14. Federal Bonus Depreciation
    - Variable: FederalBonusDepreciation
    - Source: CCH (1980 - 2010)
    - Definition: An indicator for whether or not federal bonus depreciation is allowed in a given state-year.
15. Sales Apportionment Weight
    - Variable: sales_wgt
    - Source: Bernthal et al. (2012)
    - Definition: The share of national profits of multi-state firms that are allocated to sales (for tax purposes) in a given state.

A.2 Definitions of Broadening/Narrowing and Expected Sign of Interaction Terms

In Tables 2-4 and Appendix Table A3 we analyze changes in base rules and code changes as narrowing or broadening. This definition also maps into expected signs for the interaction between taxes and base controls in equation 5 as follows:

- Throwback Rules: "no" to "yes" is base broadening. Expected interaction sign: positive.
- Combined Reporting Rules: "no" to "yes" is base broadening. Expected interaction sign: positive.
- Investment Tax Credit: increase in credit is base narrowing. Expected interaction sign: negative.
- Research and Development Tax Credit: increase in credit is base narrowing. Expected interaction sign: negative.
- Incremental R&D Credit, Base is Moving Average: "no" to "yes" is base broadening. Expected interaction sign: positive.
- Incremental R&D Credit, Base is Fixed: "no" to "yes" is base broadening. Expected interaction sign: positive.
- Loss Carryback Rules: increase in years is base narrowing. Expected interaction sign: negative.
- Loss Carryforward Rules: increase in years is base narrowing. Expected interaction sign: negative.
- Franchise Tax (indicator): "no" to "yes" is base narrowing. Expected interaction sign: negative.
- Federal Income Tax Deductible: "no" to "yes" is base narrowing, "yes" to "no" is base broadening. Expected interaction sign: negative.
- Federal Income as State Tax Base: "no" to "yes" is base broadening, "yes" to "no" is base narrowing. Expected interaction sign: positive.
- Federal Accelerated Depreciation: "no" to "yes" is base narrowing. Expected interaction sign: negative.
- Accelerated Cost Recovery System (ACRS) Depreciation: "no" to "yes" is base narrowing. Expected interaction sign: negative.
- Federal Bonus Depreciation: "no" to "yes" is base narrowing. Expected interaction sign: negative.
- Sales Apportionment Weight: increase in sales weight is base narrowing. Expected interaction sign: negative.

A.3 R&D Tax Credit Base

The effective R&D tax credit rate is a combination of 3 factors: the statutory R&D tax credit rate, the base level definition, and the recapture policy (Wilson, 2005). States vary in the definition of the applicable base for R&D tax credits. As pointed out in Wilson (2009), such definitions fall into 3 major categories:

1. **Non-incremental credit**: all R&D expenditures are eligible for credit.
2. **Incremental credit with a moving average base**: only R&D expenditures above a base level determined by the firm's *recent* activity are eligible for credit. This base level is usually a moving average of the firm's R&D over the past 1-4 years (Wilson, 2005).
3. **Incremental credit with a fixed-period base**: only R&D expenditures above a base level determined by the firm's activity *during a fixed past period* are eligible for credit.

From 1980-2010, several states rely on the federal definition of the base level. The federal definition used a 3-year moving average until 1989, which was computed as the multiplication of current sales and the average R&D-to-sales ratio over the past 3 years (Wilson (2009); Chang (2014); Rao (2016)). With the passage of Public Law 101-239 on December 19, 1989, the federal R&D regime shifted to a fixed-period base level definition (Chang, 2014). Under this regime, the base level is computed as a firm's recent sales times the average R&D-sales ratio over the period 1984-1988 (Wilson, 2005). In addition, states have set their own definitions of the R&D tax base. To account for the effects of different R&D tax credit regimes on state tax revenues and economic activity, we control for two indicators of the type of incremental base a state might have: fixed or moving average. We use data from Wilson (2009) to generate these indicators.

A.4 Bartik Tax Base Rules

1. Property taxes
    - Variable: propertytax
    - Source: Bartik (2017)
    - Definition: Real property tax rate for industrial real property, industrial machinery and equipment, and industrial inventories. Real property includes both land and buildings. For all non-manufacturing industries, the commercial tax rates are applied. The tax rates are applied to real property, and to personal property excluding inventories. Inventories are assumed to always be exempt. The tax rates were interpolated for missing years, assuming the tax rate changes linearly between the two years given.
2. Property tax abatement
    - Variable: propabatement
    - Source: Bartik (2017)
    - Definition: The nominal value of the property tax abatement rate for each city under consideration in Bartik (2017). The database in Bartik (2017) seeks to determine not just what the state allows in property tax abatements, but what specific cities do.
3. Job creation tax credits
    - Variable: jobcreationcred
    - Source: Bartik (2017)
    - Definition: The nominal value of the job creation tax credit, calculated before considering any limits on the tax credit.

B Construction of Neighbor and Similar States

B.1 Neighboring States

Neighbor states are states that share a border of any length. There exist 109 unique state border pairs, including pairs sharing a single-point border. States with no interstate border are not included in the sample. We draw our border data from Holmes (1998). It includes 48 states (Alaska and Hawaii share no borders with other US states). The District of Columbia is excluded from our sample. We then construct a dataset with 218 state border pairs such that for each bordering states i and j, we have the state pair ij and ji. We then merge corporate tax rate and base measure data for each state i and bordering state j from 1980-2010.

B.2 Similar States

We use state-level demographic and economic characteristics to construct a measure of state similarity. For each state i and year t in our sample, we fit a logistic regression to estimate the probability that state $j \neq i$ is state i in year t. The estimates from this regression provide a measure of how similar states are to a given state in a given year.

Specifically, for each state-year, we estimate the specification:

$$\begin{aligned} Prob(j = i)_{jt} = \beta_0 + \beta_1 manuf_{jt} + \beta_2 service_{jt} + \beta_3 agr_{jt} + \beta_4 constr\_mine_{jt} \\ + \beta_5 skill_{jt} + \beta_6 \log(pop)_{jt} + \varepsilon_{jt} \end{aligned} \tag{9}$$

where $Prob(j = i)$ is the probability that state j is state i; $manuf$ is manufacturing share of state GDP; $service$ is information and professional services' share of state GDP; agr is agriculture, forestry, fishing and hunting share of state GDP; $constr\_mine$ is construction, mining and utilities share of state GDP; $skill$ is the share of the state population over 18 with a Bachelor's Degree or above; and $\log(pop)$ is log state population in year t. Appendix Table A12 summarizes the covariates used to construct the similarity index. Industry share of GDP was measured by the Bureau of Economic Analysis. We then calculate the "distance" between j and i, defined as $d_{ij} = [LProb(i = j) - LProb(i = i)]^2$, or the squared difference between the linear probabilities.[34] State i's "similar" state in year t is the state whose estimated probability yields the smallest d_{ij} in year $t - 1$.

A key difference between identifying border and similar states is that state similarity is not necessarily reciprocal. In other words, Maine may be similar to Vermont in year t, but Vermont is not necessarily similar to Maine.

One shortcoming of this method is that it does not identify similar matches for all states in all years. Only 25 states have a "similar" state for every sample year; the other 25 are missing matches in some or all sample years. The reason is that some states are too economically different from the rest of the nation. For example, California has no matches because it is exactly identified by its population, and the probability that any other state is California is infinitely close to 0.[35] Appendix Table A13 lists all states in our sample and their "similar" states in the year before a tax rate or base change. We hold the "similar" state constant in the years surrounding an event when estimating the results of Appendix Tables A5 and A6, and Appendix Figure A29.

B.3 Estimating Event Probability Subject to Events in Similar States

Appendix Tables A5 and A6 describe how the probability of a corporate tax rate or base change is affected by events in states' neighbors and economically similar counterparts. Let Y_{it} indicate a corporate rate increase or decrease, or broadening or narrowing of the tax base in state i and year t. Denote the set of neighbors and similar states $j \neq i$. The results in Appendix Table A5 are estimated by running a probit regression of the

[34] We estimate the Hosmer-Lemeshow statistic for each logistic regression, and fail to reject the null that the indicator of wether any state is state i is orthogonal to the covariates listed in equation 9. This suggests that the matching regression has high predictive power.

[35] We explored using OLS to avoid these issues when estimating $Prob(j = i)_{jt}$, but this approach can yield predicted probabilities that fall outside the range of 0 to 100%.

form:

$$P(Y_{it}=1) = \beta_0 + \beta_1 D[RateInc]_{j,t-1} + \beta_2 D[RateDec]_{j,t-1} + \beta_3 D[BaseNarrow]_{j,t-1} + \beta_3 D[BaseBroaden]_{j,t-1} + \varepsilon_{it} \quad (10)$$

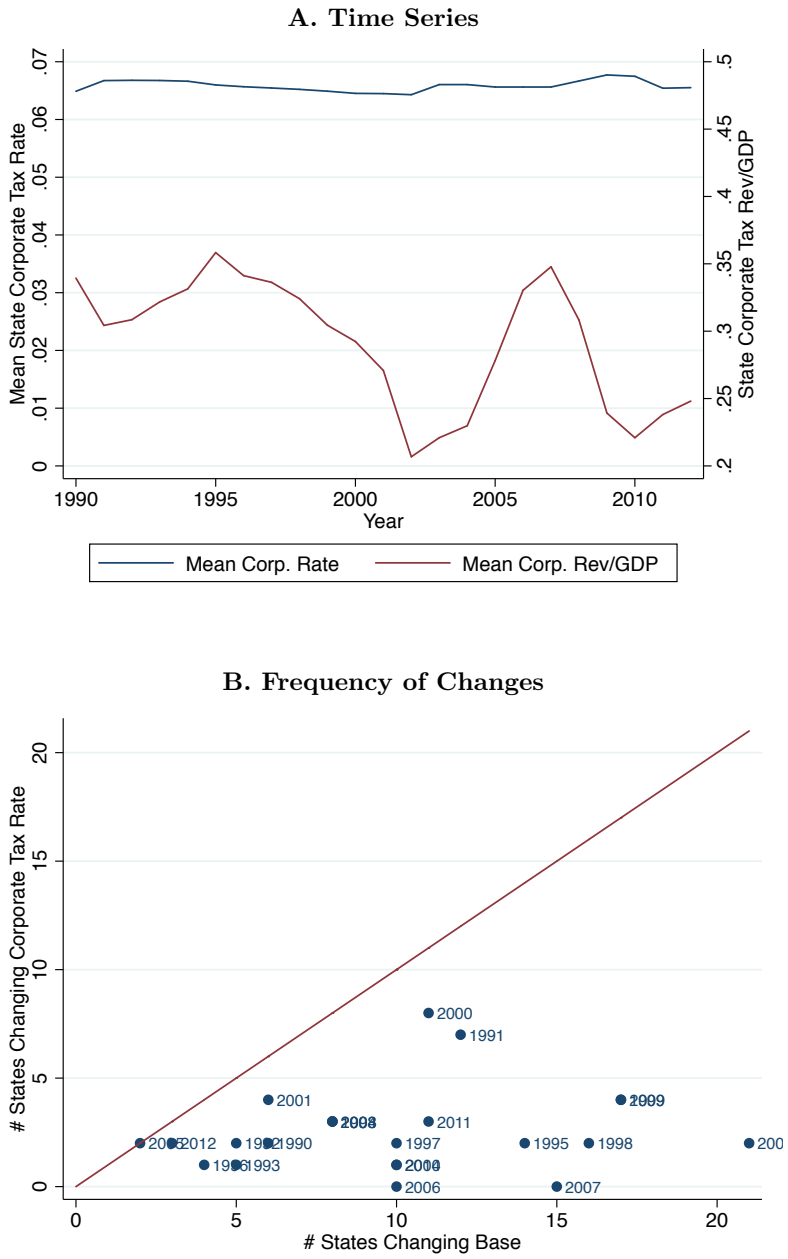
while the results in Appendix Table A6 are estimated by similarly estimating

$$P(Y_{it}=1) = \beta_0 + \beta_1 D[RateInc]_{j,t'} + \beta_2 D[RateDec]_{j,t'} + \beta_3 D[BaseNarrow]_{j,t'} + \beta_3 D[BaseBroaden]_{j,t'} + \varepsilon_{it} \quad (11)$$

where $t' \in [t-5, t-1]$.

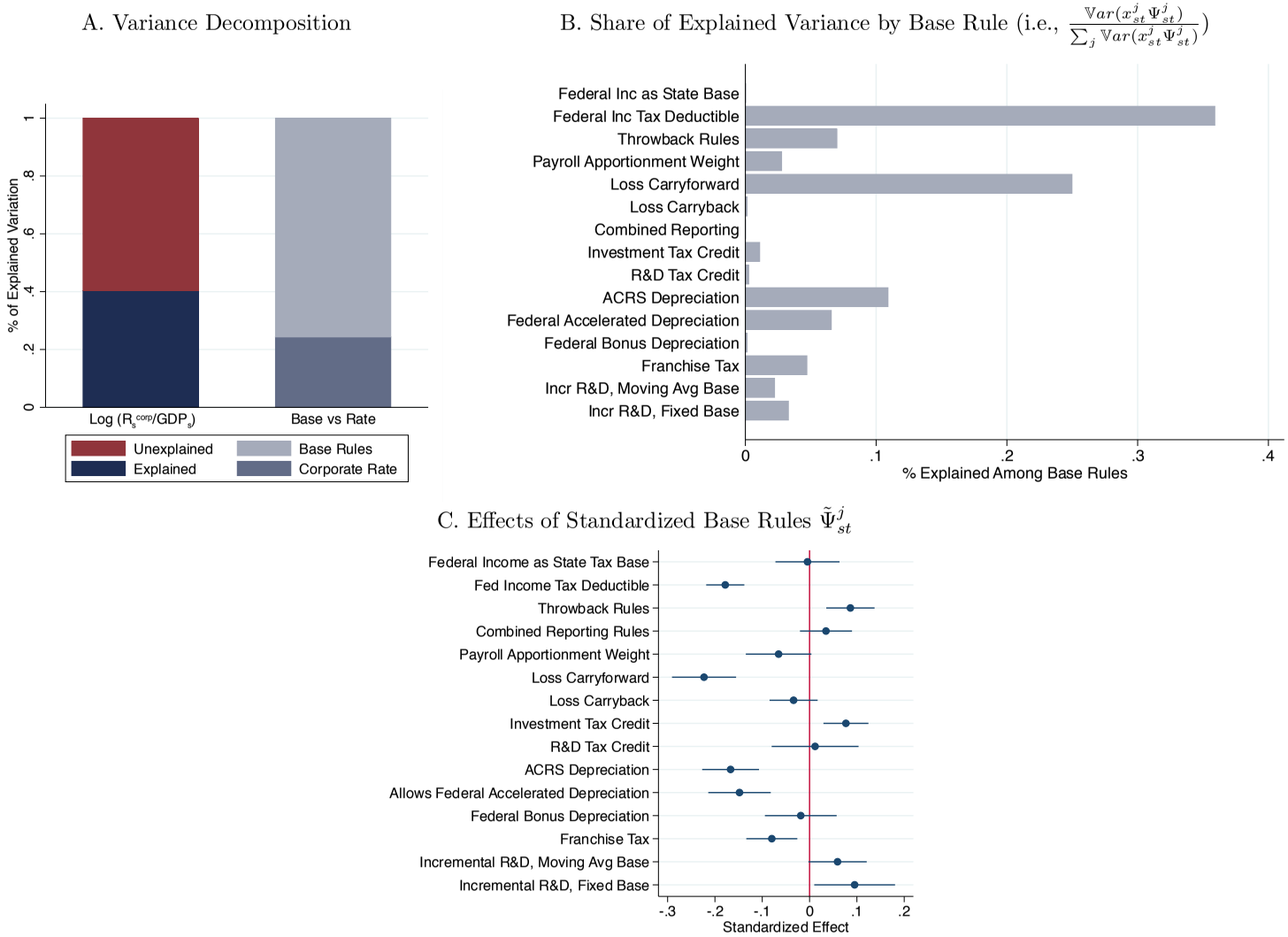
In the neighbor states case, we consider changes in corporate tax rate and in tax base that took place in any of i's border states. For example, the indicator for whether a corporate rate increase took place in Maine's neighboring states in the previous year equals 1 if Vermont's corporate tax rate increased in year $t-1$. We present results for $k=1$, i.e., a neighbor changed rates last year, and $k \in [1,5]$, i.e., if an event occurred at least once in the previous five years.

Figure A1: Changes in State Corporate Tax Structure - Bartik Sample



NOTES: This figure shows annual trends in both the mean corporate tax rate across states and corporate tax revenue as a share of GDP in Panel A. Panel B shows by year the number of states that changed rates and tax base provisions. It illustrates that these pairs are not on a 45 degree line, so most years in which many states change base provisions are not years in which many states also change rates. Note that this figure is analogous to Figure 2, but only on 33 states from 1990-2010 (i.e. availability along the Bartik controls dimension). See Section 1 for details on data sources.

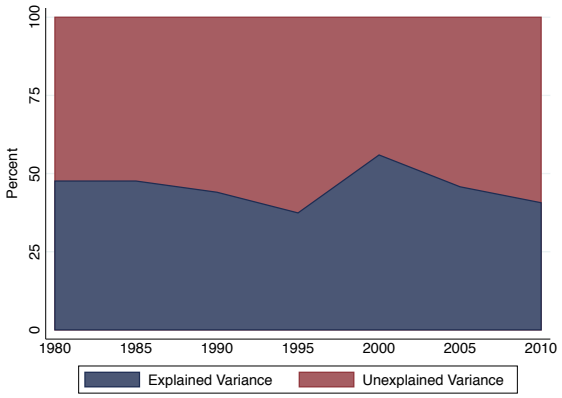
Figure A2: Variance of Log State Corporate Tax Revenue as a Share of GDP



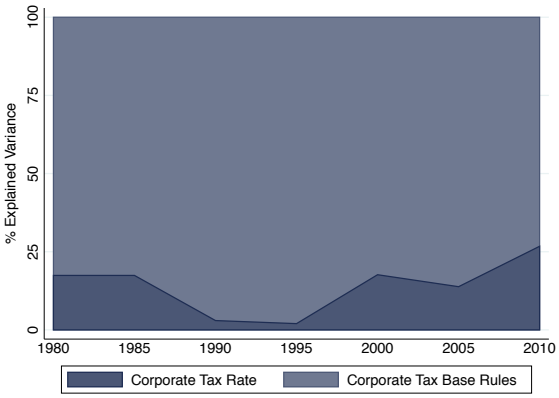
Notes: This figure replicates Figure 5 using $\ln R_{st}$ as the outcome. Panel A decomposes the variation in log state corporate tax revenue share of state GDP from 1980-2010 using equation 2. Panel B displays the contribution to base variation from each base rule. Panel C plots the effect of each base rule on the state corporate tax revenue share of state GDP from 1980-2010. We standardize each base rule prior to determining the coefficients to facilitate comparisons across base rules with different variances. See Section 3 for details. The decomposition is weighted by mean state GDP across our sample period. See Section 1 for details on data sources.

Figure A3: Log Corporate Tax Revenue Share of GDP - Variance Decomposition - 5-Year Splits

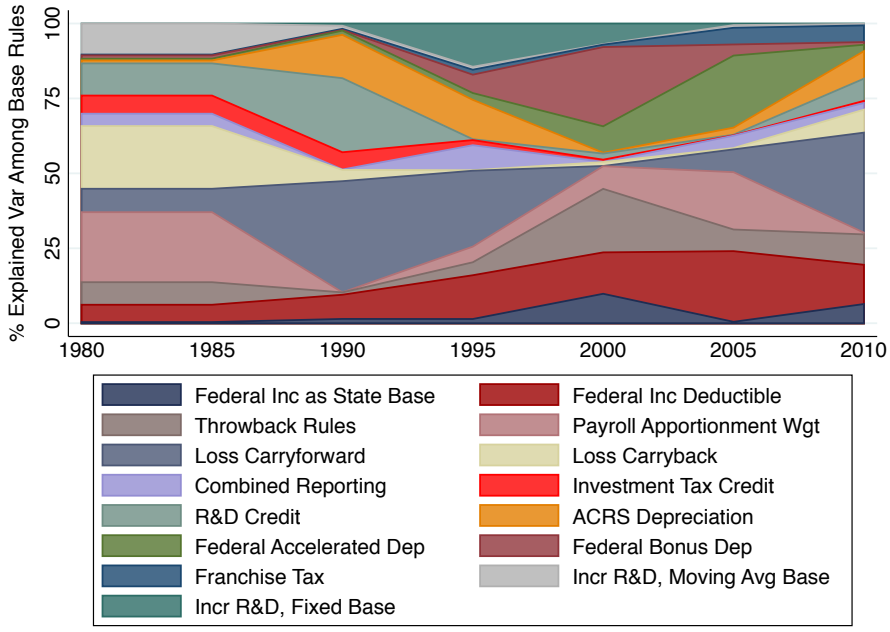
A. Variance Decomposition



B. Share of Explained Variance, Rate vs. Base

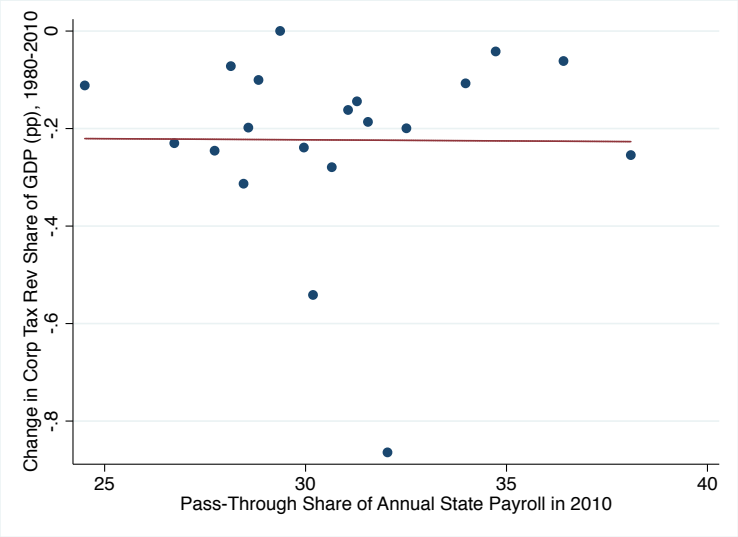


C. Share of Explained Variance by Base Rule (i.e., $\frac{\mathbb{V}ar(x^j_{st}\Psi^j_{st})}{\sum_j \mathbb{V}ar(x^j_{st}\Psi^j_{st})}$)



NOTES: This figure replicates Figure 6 using $\ln R_{st}$ as the outcome.Panel A decomposes the variation in log state corporate tax revenue share of state GDP from 1980-2010 using equation 3. Panel B displays the contribution to base variation from each base rule. Panel C plots the effect of each base rule on the state corporate tax revenue share of state GDP from 1980-2010. See Section 3 for details. The decomposition is weighted by mean state GDP across our sample period. See Section 1 for details on data sources.

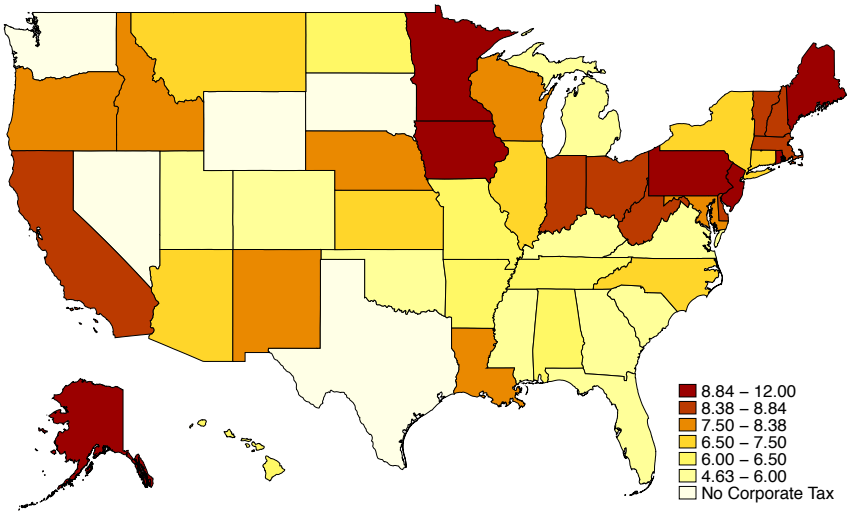
Figure A4: Corporate Rate Changes Relative to State Share of Pass-through Activity



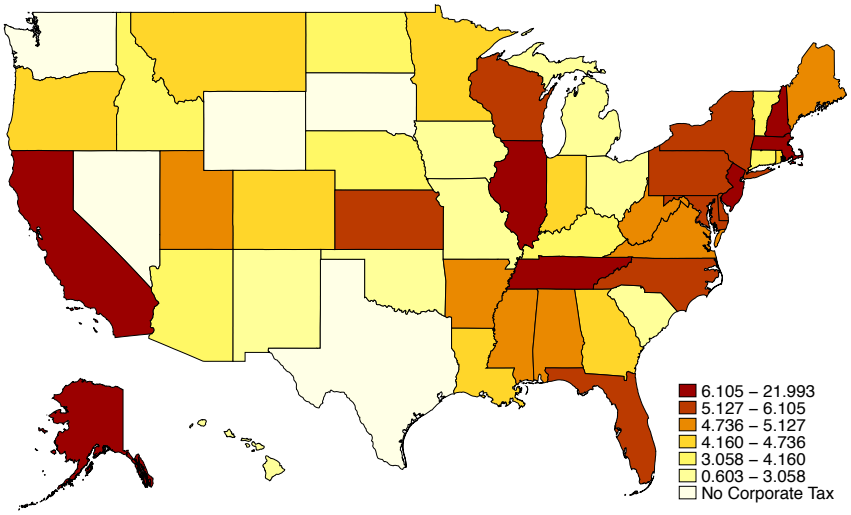
NOTES: This figure plots the percentage-point change in state corporate income tax revenue as a share of GDP between 1980 and 2010, relative to share of annual state payroll attributed to pass-through corporations in 2010. The cross-section includes all 50 states. Annual payroll includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees. For corporations, payroll includes amounts paid to officers and executives; for unincorporated businesses, it does not include profit or other compensation of proprietors or partners. Payroll is reported before deductions for social security, income tax, insurance, union dues, etc. This definition of payroll is the same as that used by the Internal Revenue Service (IRS) on Form 941 as taxable Medicare Wages and Tips (even if not subject to income or FICA tax). Data on annual pass-through payroll are from the 2010 County Business Patterns survey. See Section 1 for details on other data sources.

Figure A5: Rates & Revenue

Corporate Tax Rate - 2012



Corporate Revenue Share of Total Tax Revenue (%) - 2012



Sales Apportionment Weight - 2012

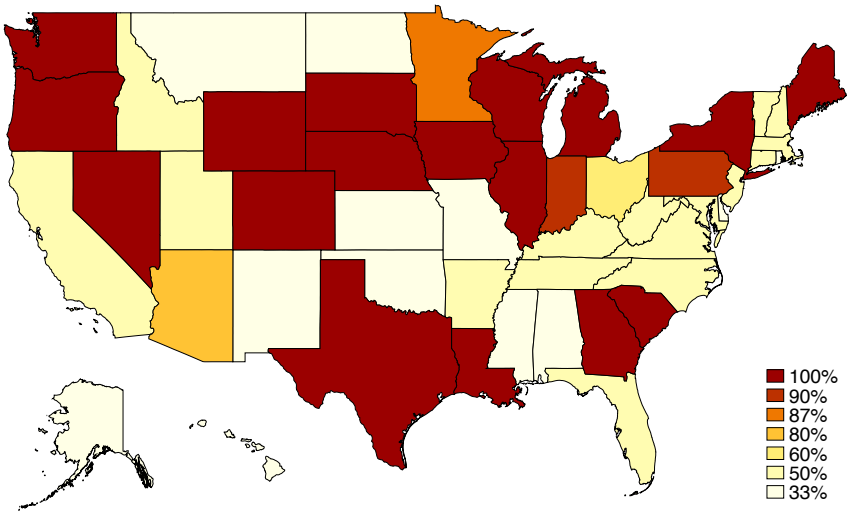


Figure A6: Corporate Tax Base Rules

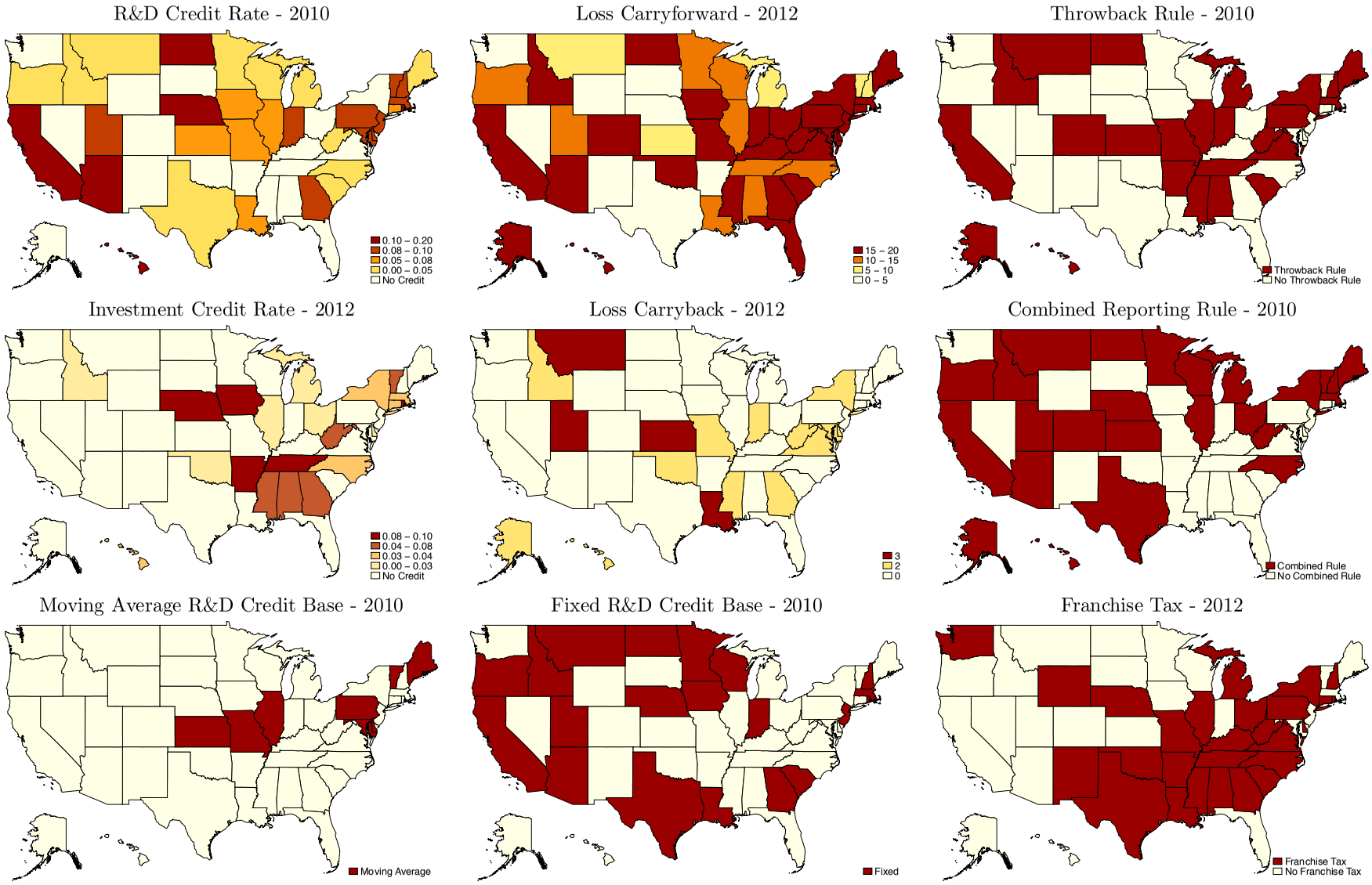
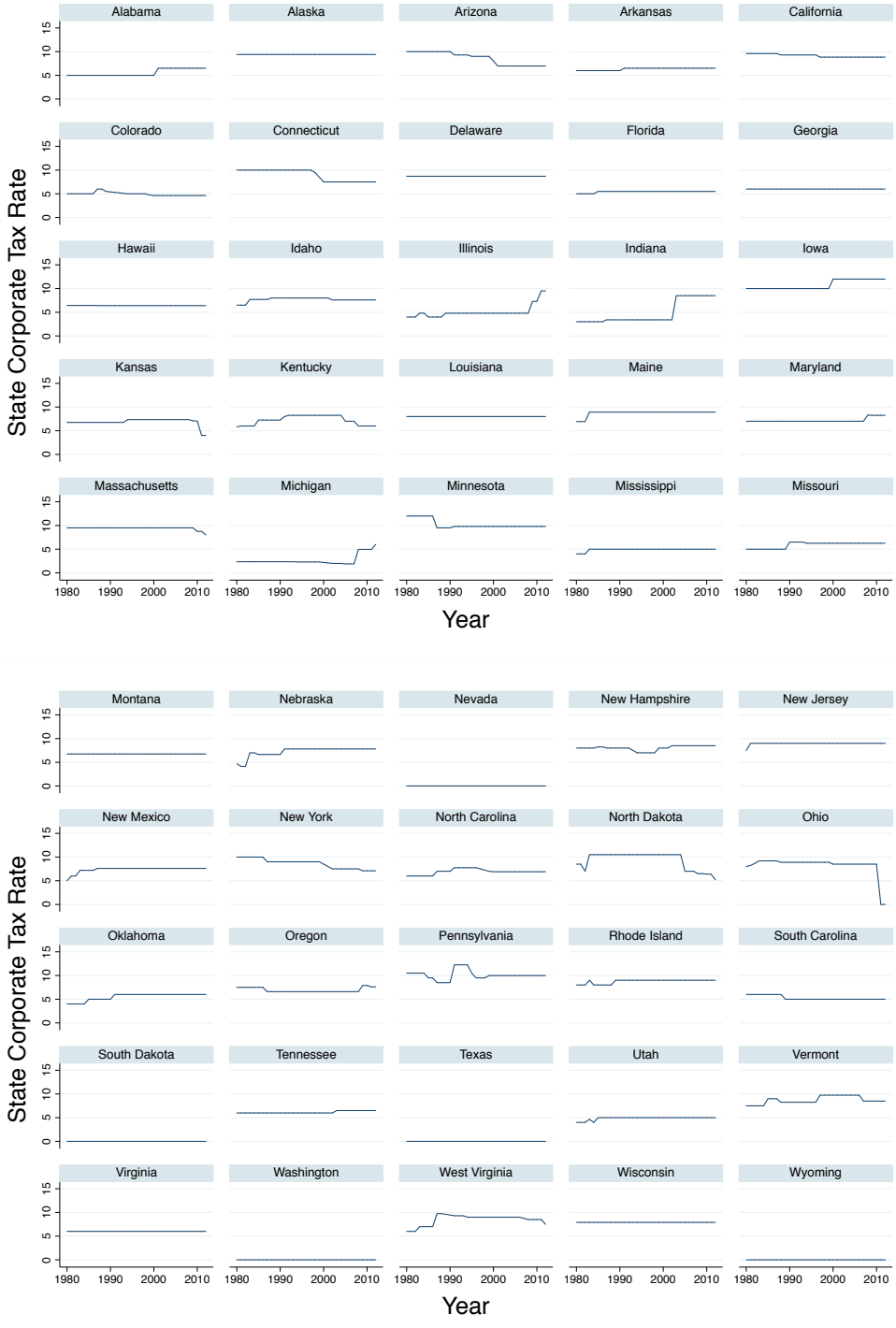
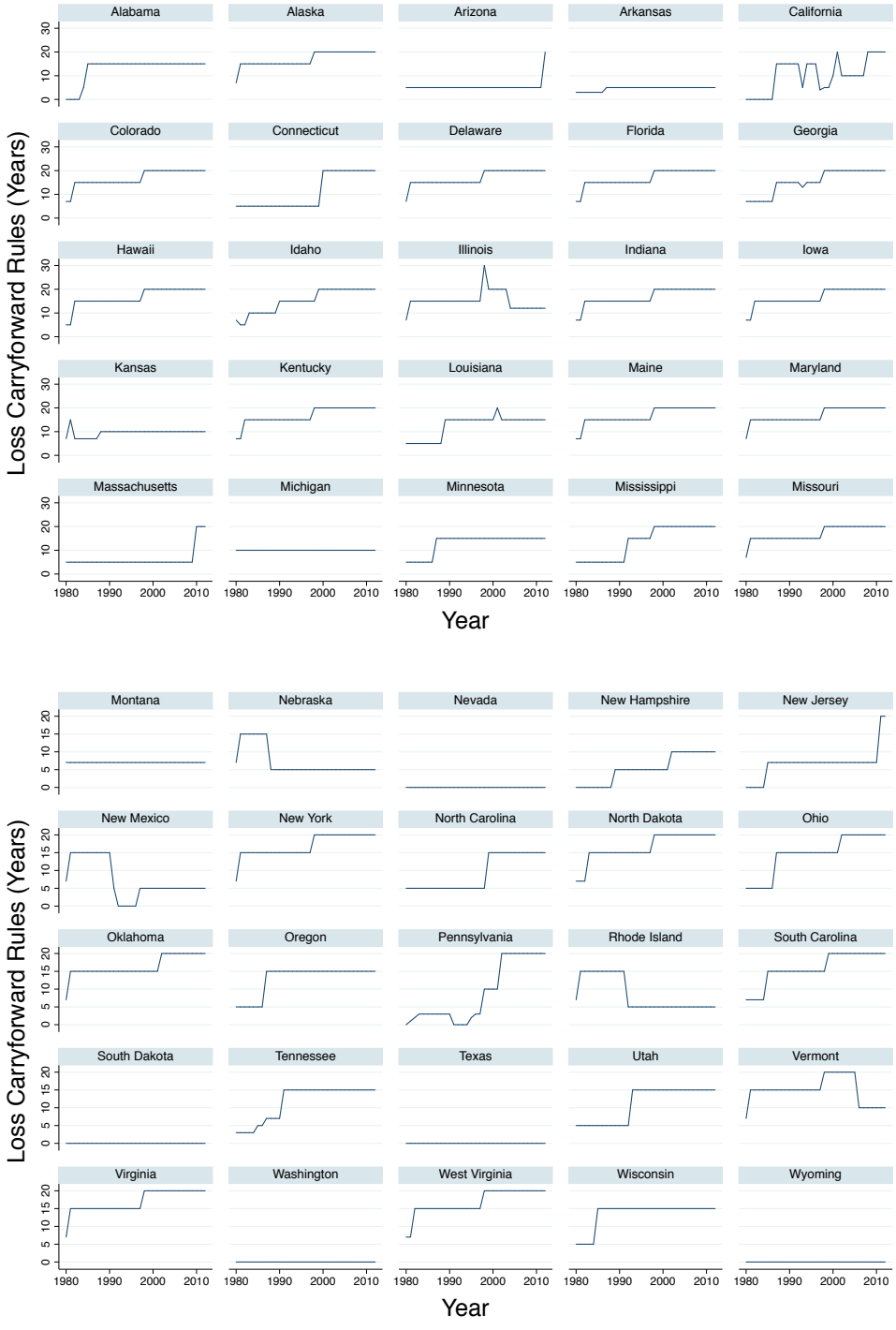


Figure A7: Corporate Tax Rate By State-Year



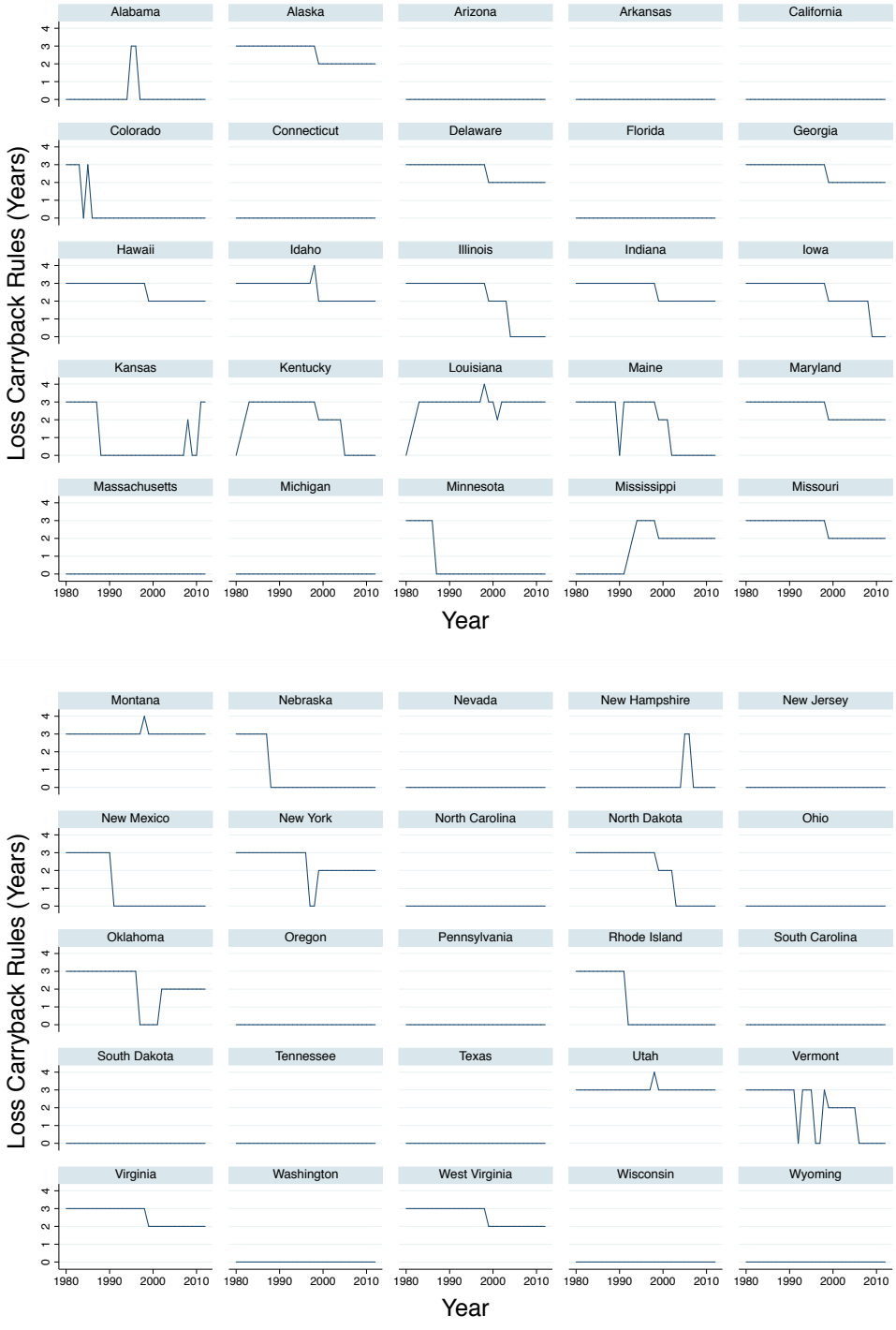
NOTES: This figure plots corporate tax rate by state from 1980-2012. See Section 1 for details on data sources.

Figure A8: Loss Carryforward Rule By State-Year



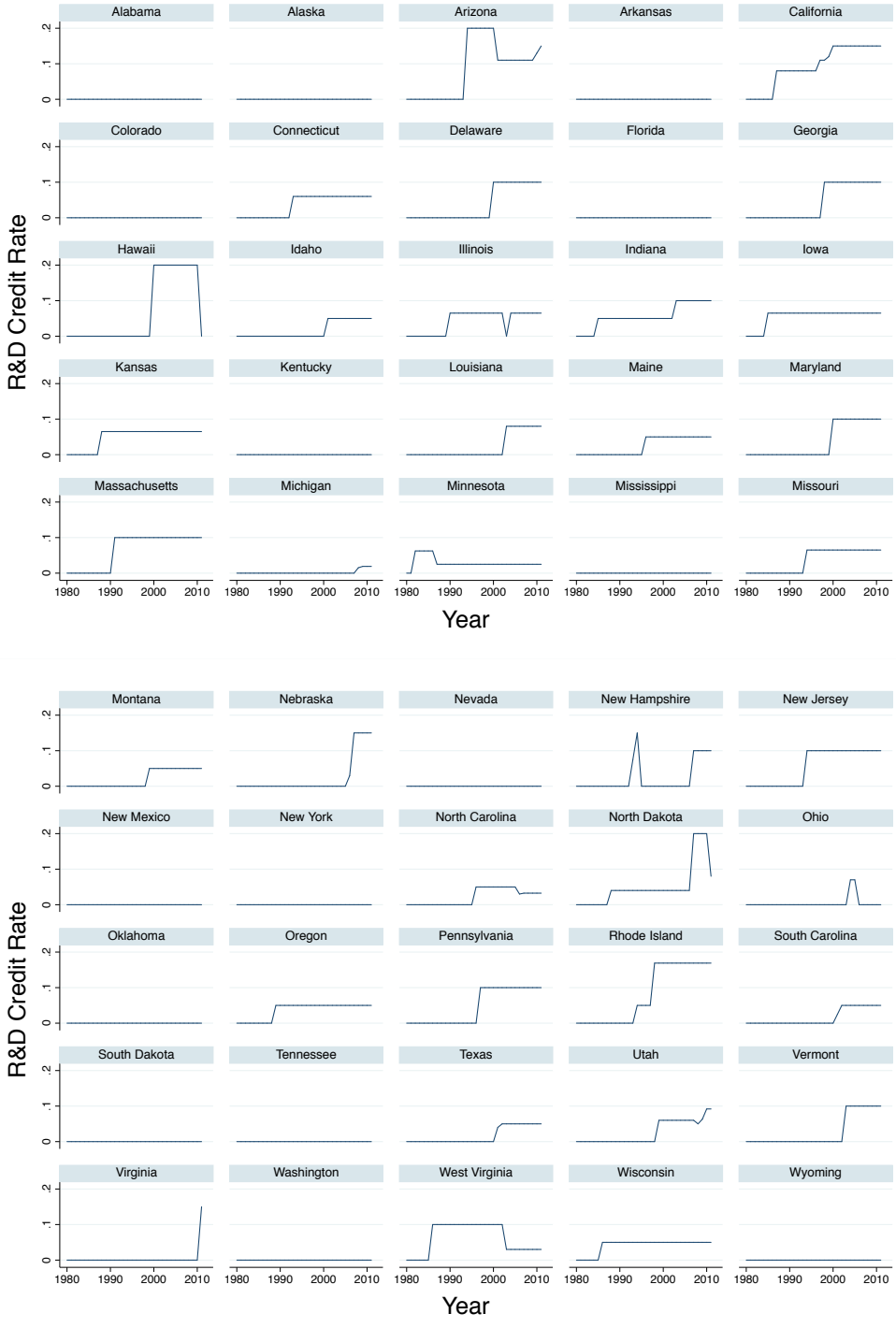
NOTES: This figure plots the number of loss carryforward years allowed by state from 1980-2012. See Section 1 for details on data sources.

Figure A9: Loss Carryback Rule By State-Year



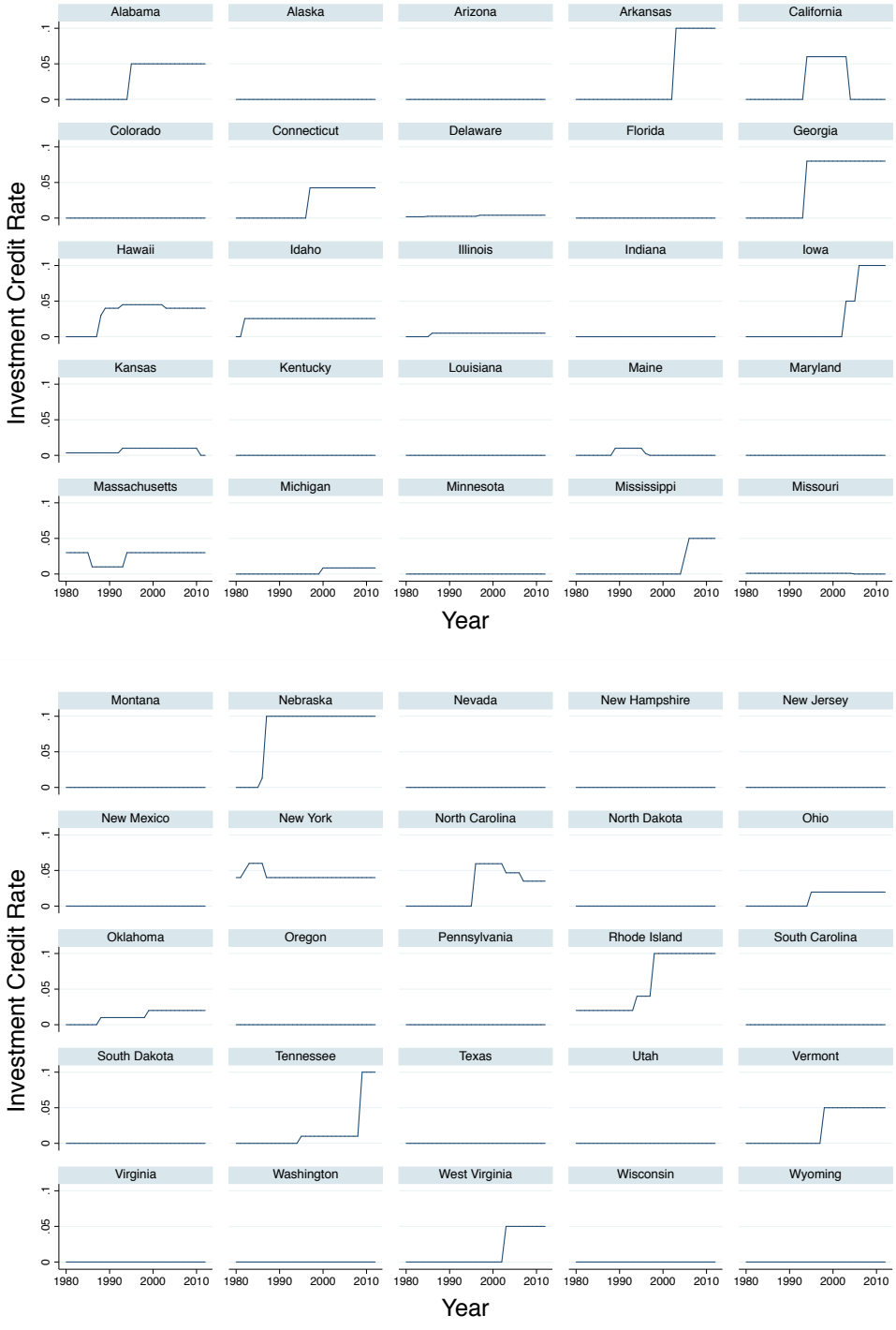
NOTES: This figure plots the number of loss carryback years allowed by state from 1980-2012. See Section 1 for details on data sources.

Figure A10: R&D Credit Rate By State-Year



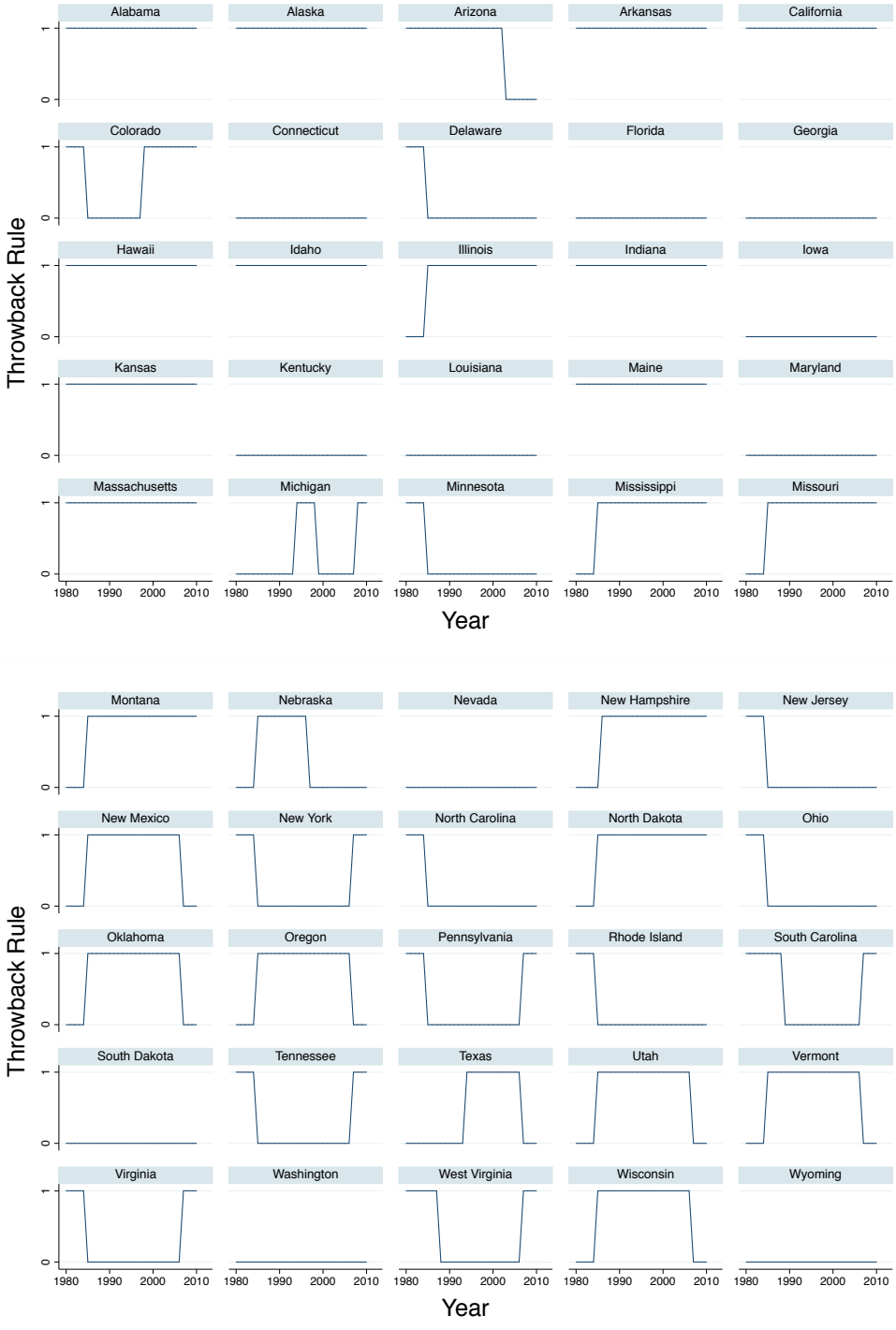
NOTES: This figure plots the R&D credit rates by state from 1980-2011. See Section 1 for details on data sources.

Figure A11: Investment Credit Rate By State-Year



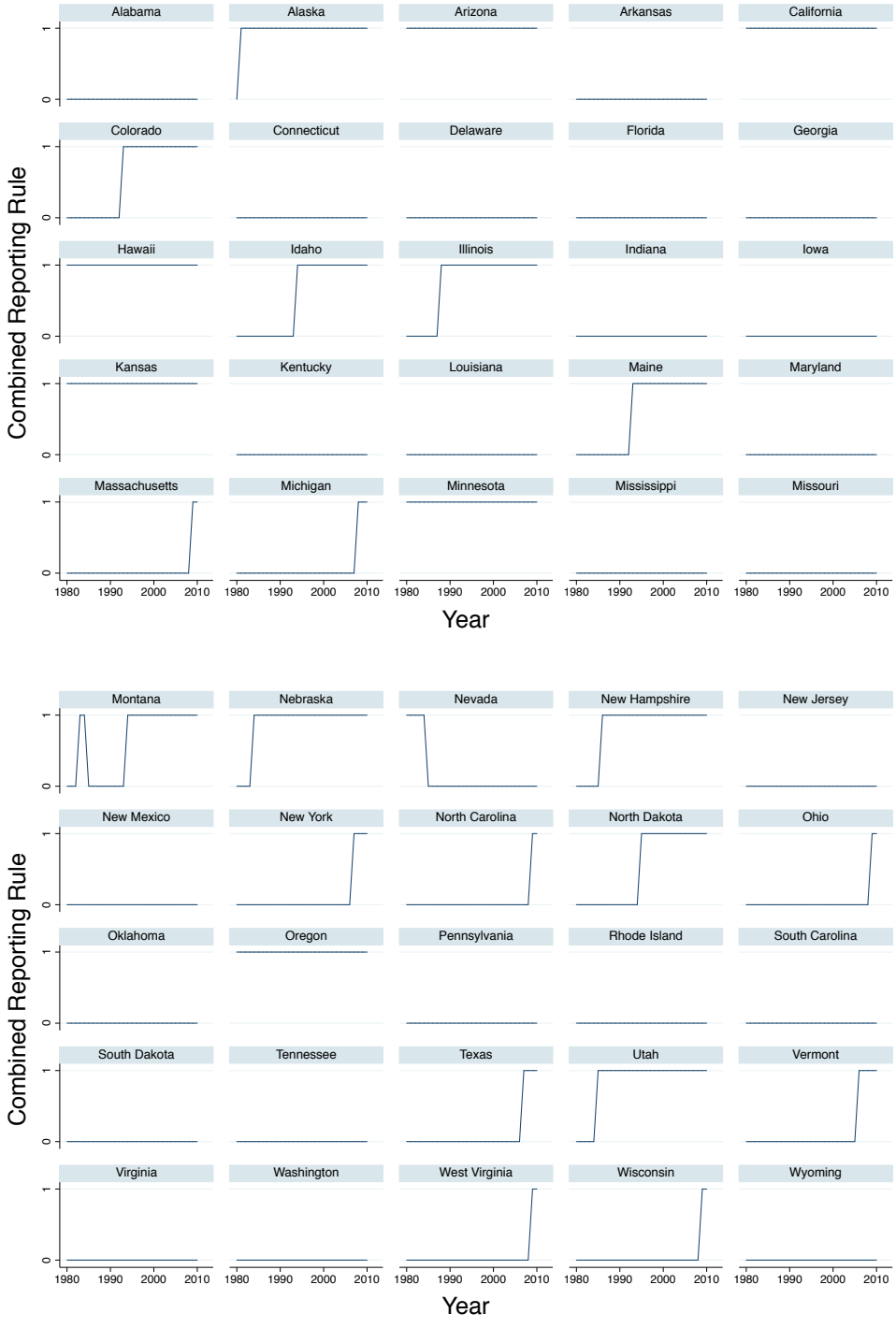
NOTES: This figure plots the investment credit rate by state from 1980-2012. See Section 1 for details on data sources.

Figure A12: Throwback Rule By State-Year



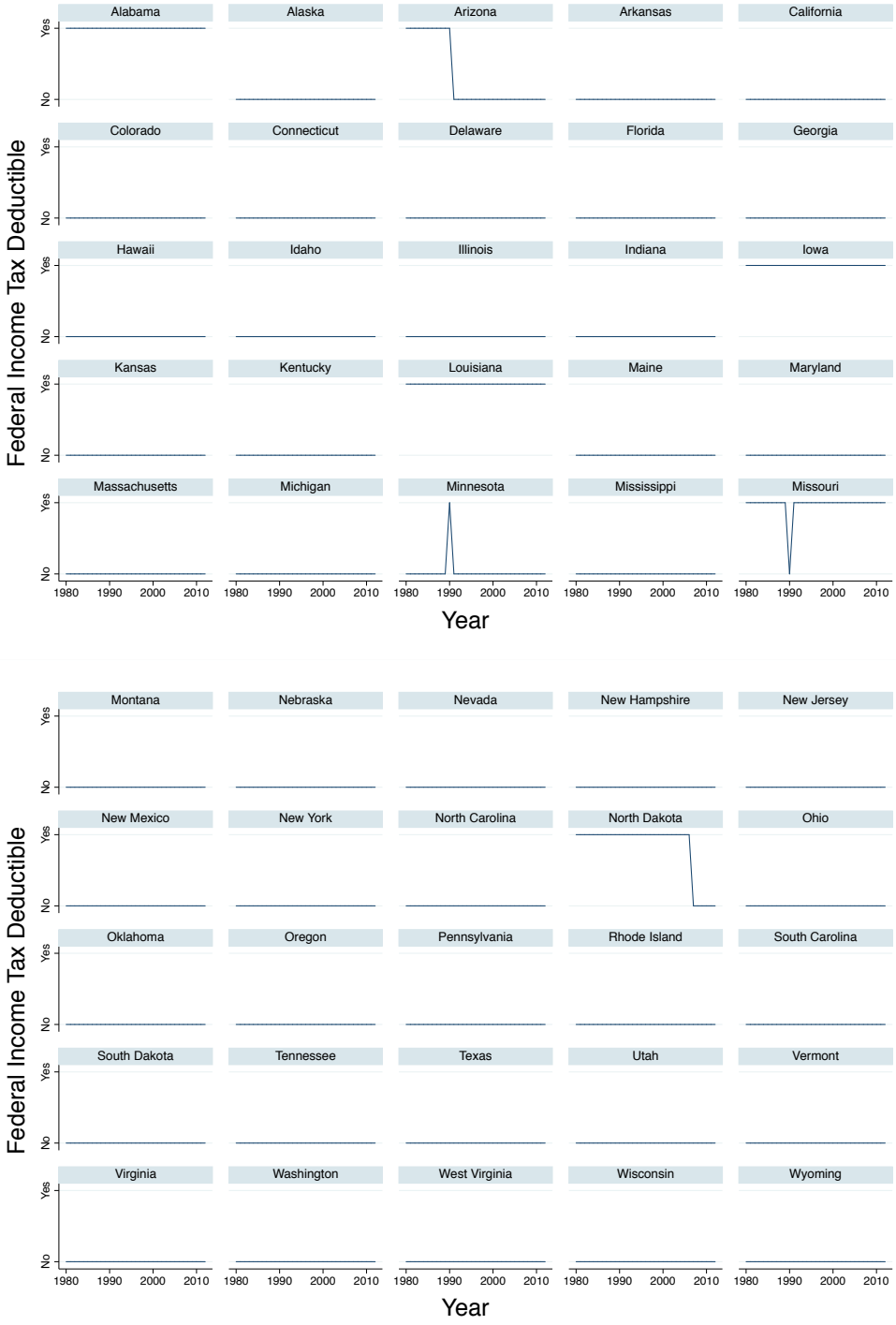
NOTES: This figure plots an indicator for having a throwback rule by state from 1980-2010. See Section 1 for details on data sources.

Figure A13: Combined Reporting Rule By State-Year



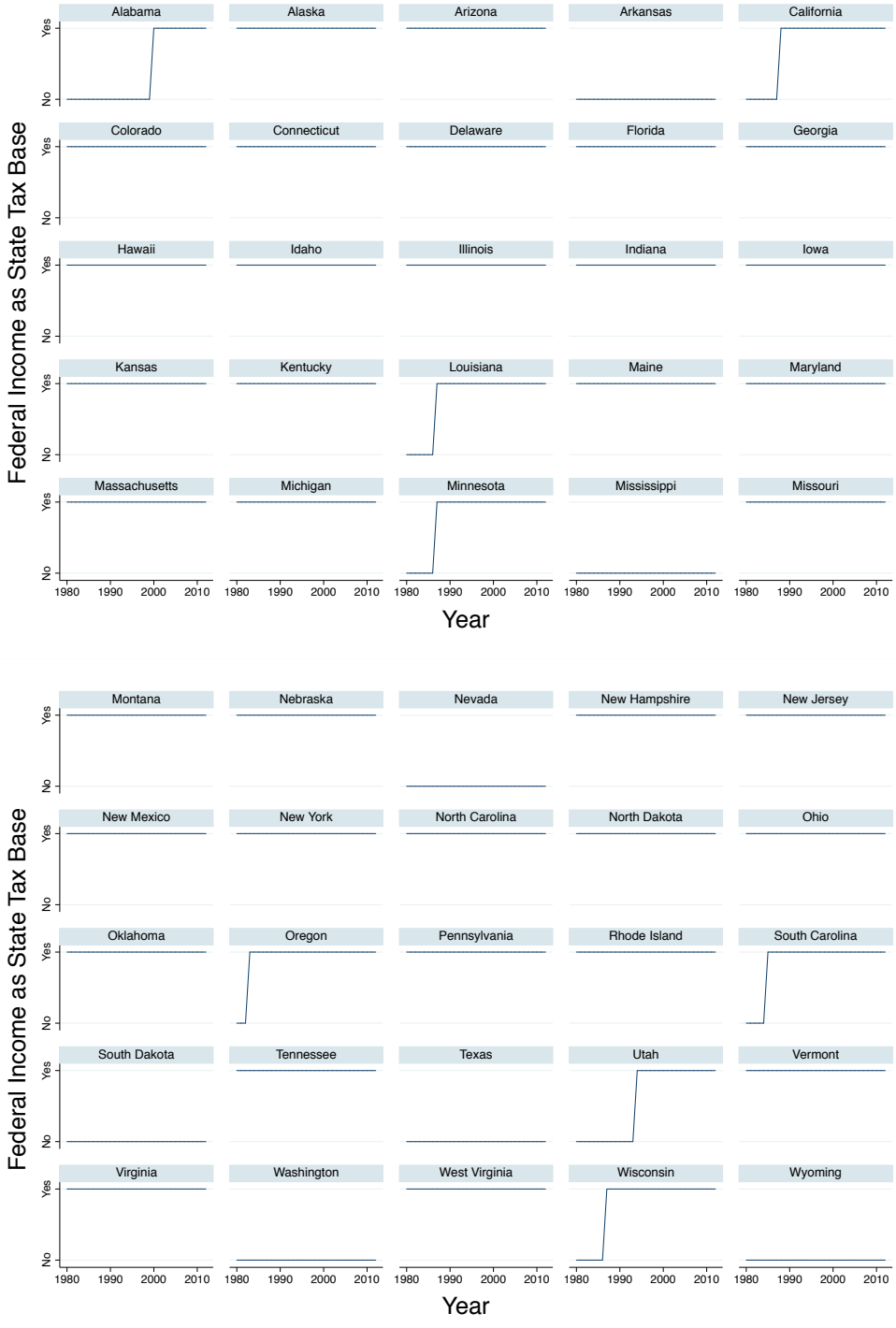
NOTES: This figure plots an indicator for having a combined reporting rules by state from 1980-2010. See Section 1 for details on data sources.

Figure A14: Federal Income Tax Deductible By State-Year



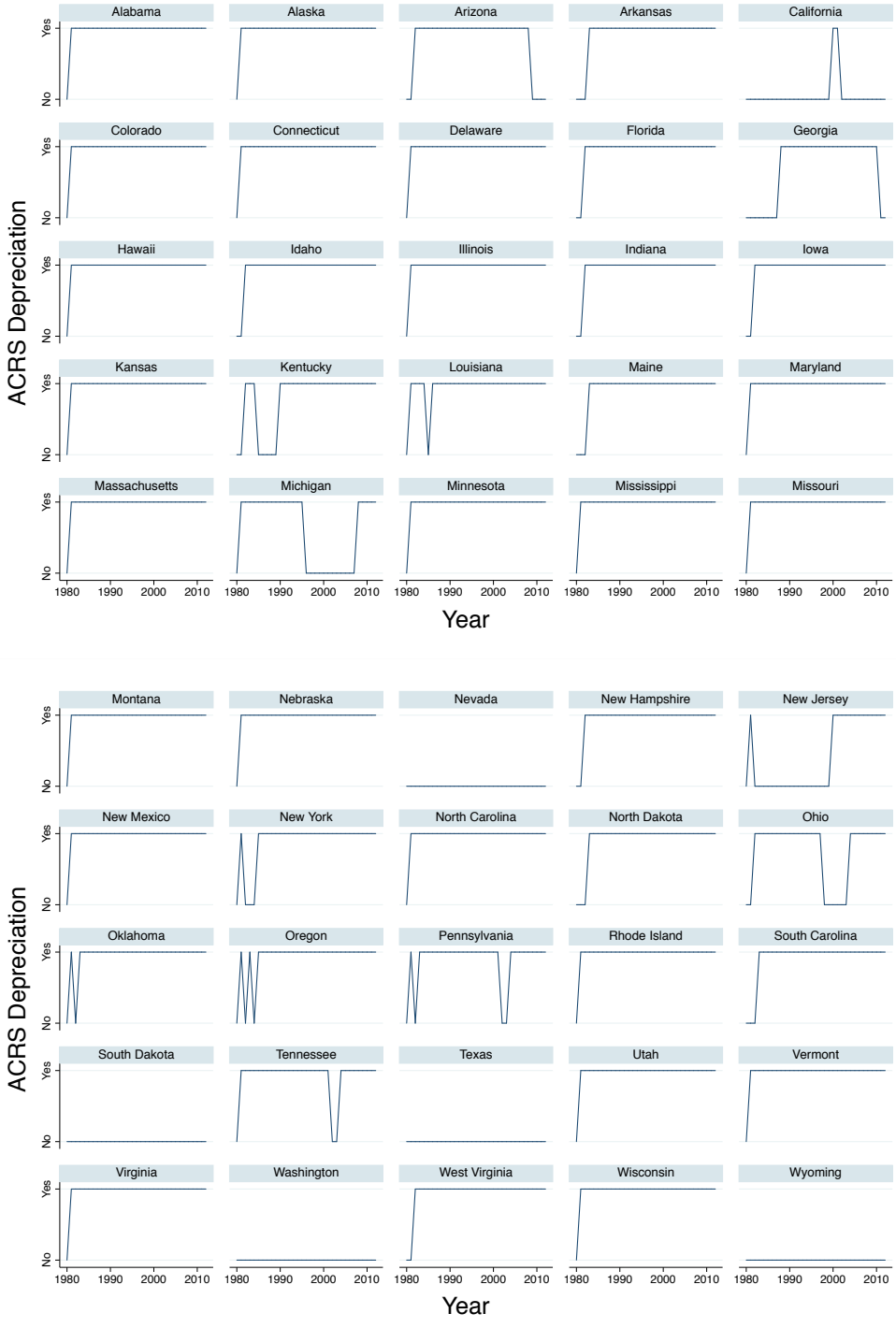
NOTES: This figure plots an indicator for federal income tax deductibility by state from 1980-2012. See Section 1 for details on data sources.

Figure A15: Federal Income as State Tax Base By State-Year



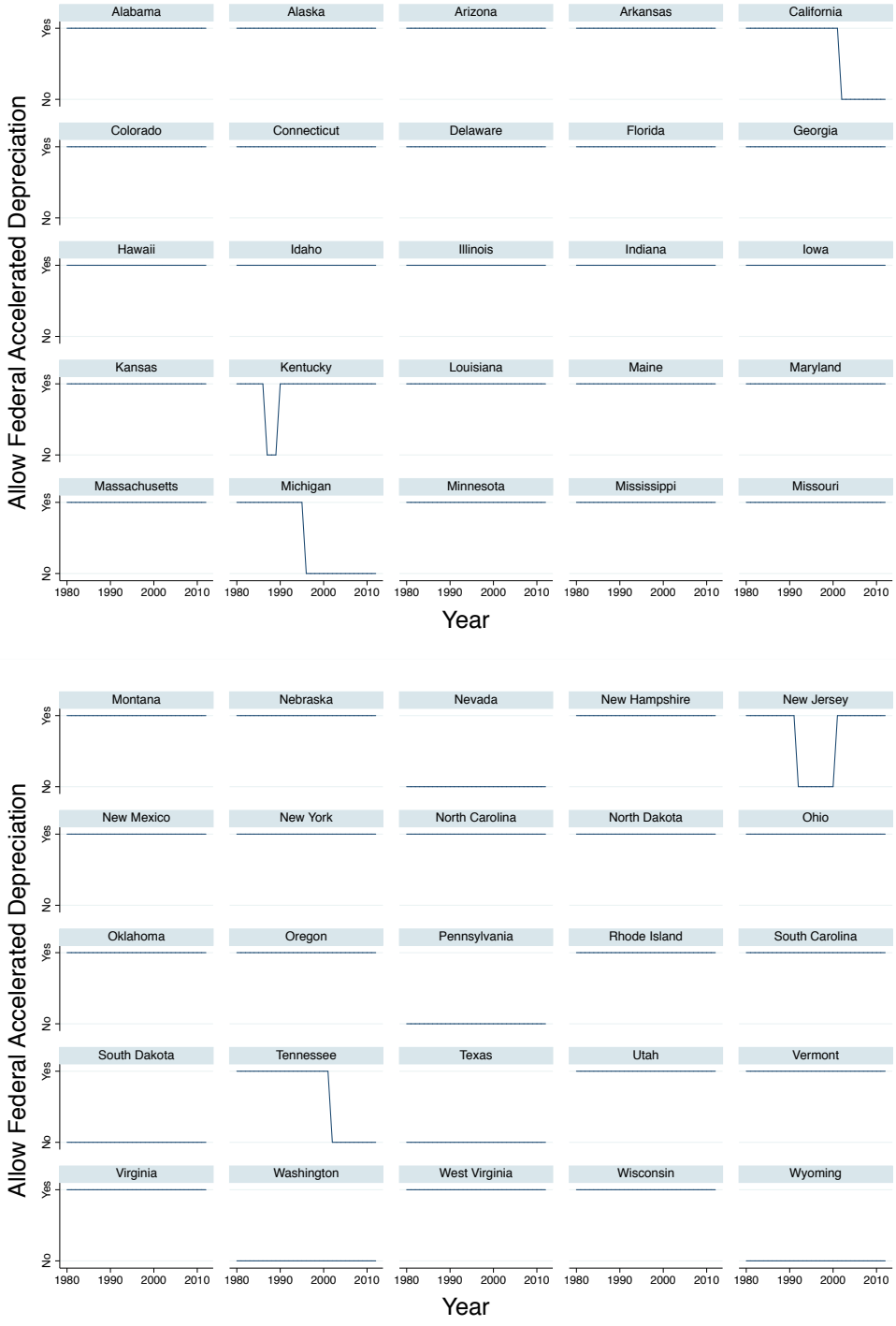
NOTES: This figure plots an indicator for federal income as state tax base by state from 1980-2012. See Section 1 for details on data sources.

Figure A16: ACRS Depreciation Rule By State-Year



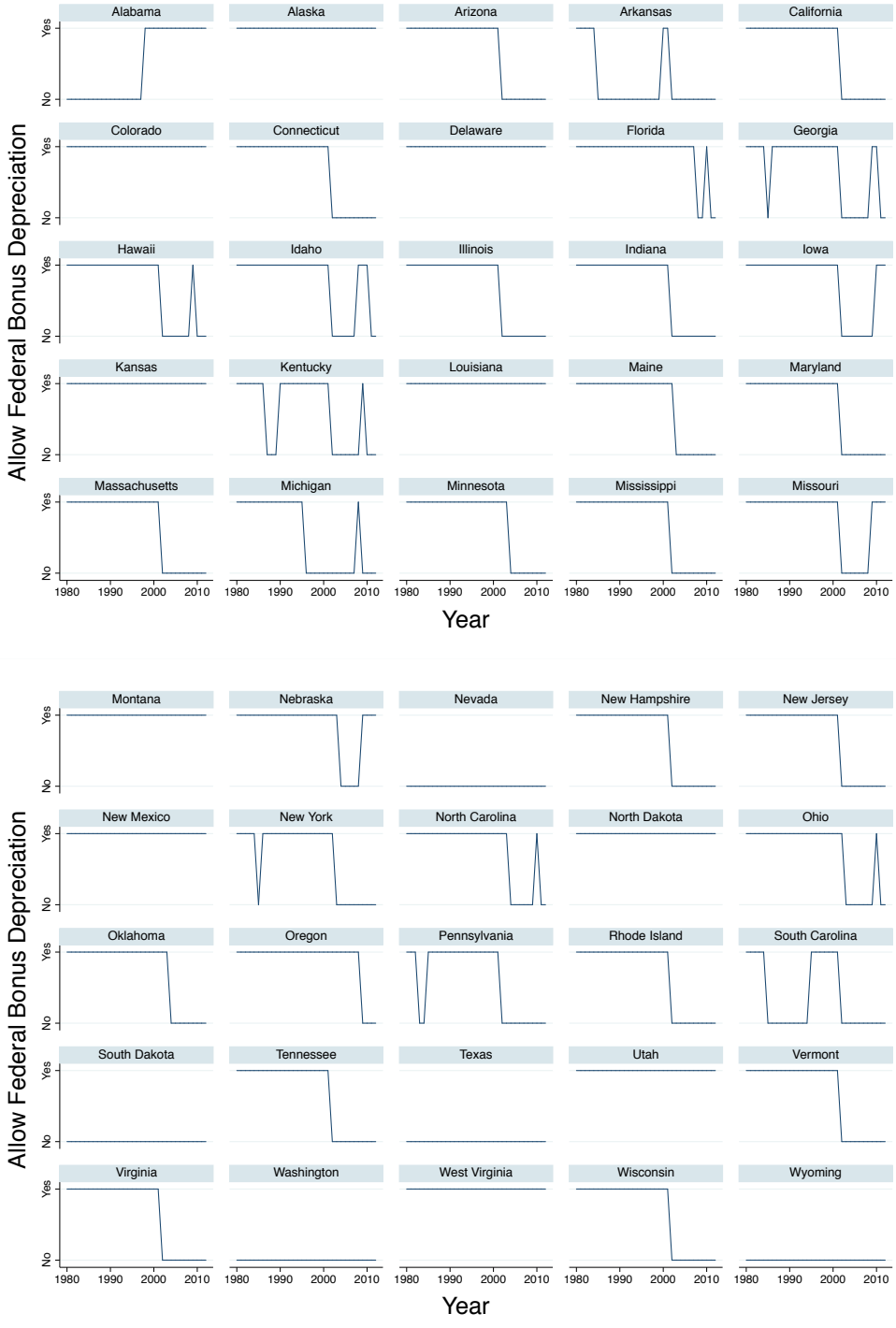
NOTES: This figure plots an indicator for ACRS depreciation by state from 1980-2012. See Section 1 for details on data sources.

Figure A17: Federal Accelerated Depreciation Rule By State-Year



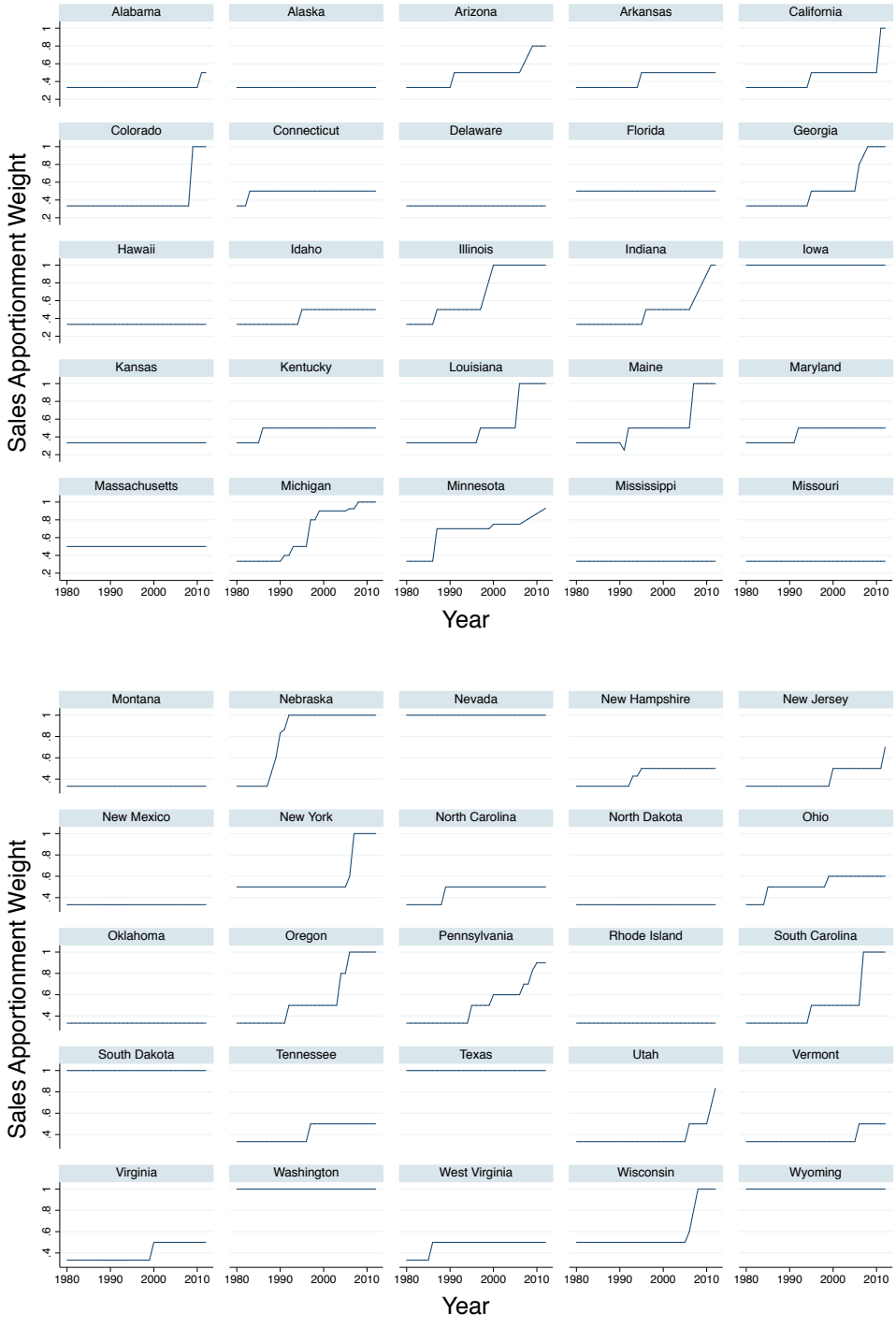
NOTES: This figure plots an indicator for federal accelerated depreciation by state from 1980-2012. See Section 1 for details on data sources.

Figure A18: Federal Bonus Depreciation Rule By State-Year



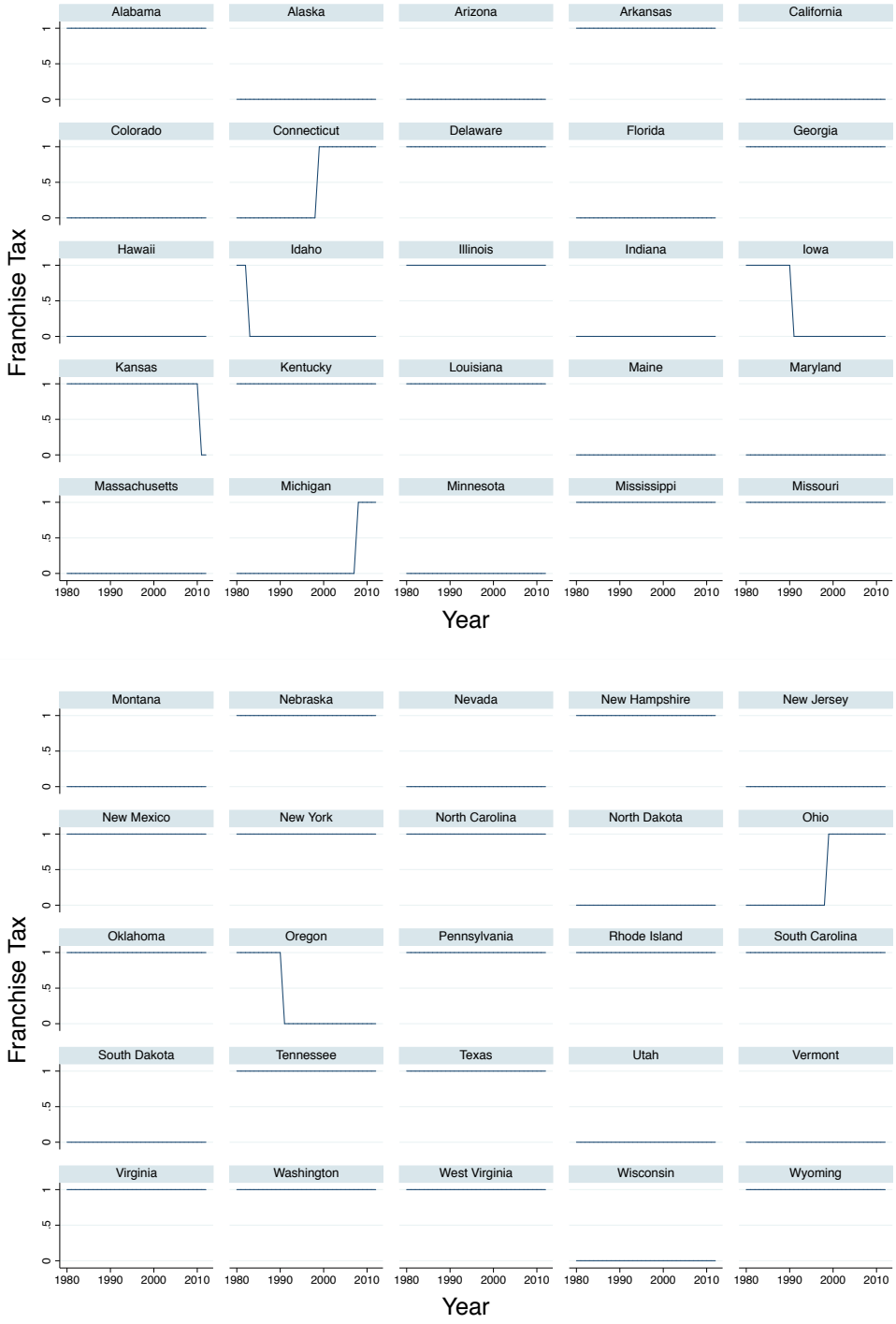
NOTES: This figure plots an indicator for federal bonus depreciation by state from 1980-2012. See Section 1 for details on data sources.

Figure A19: Sales Apportionment Weight By State-Year



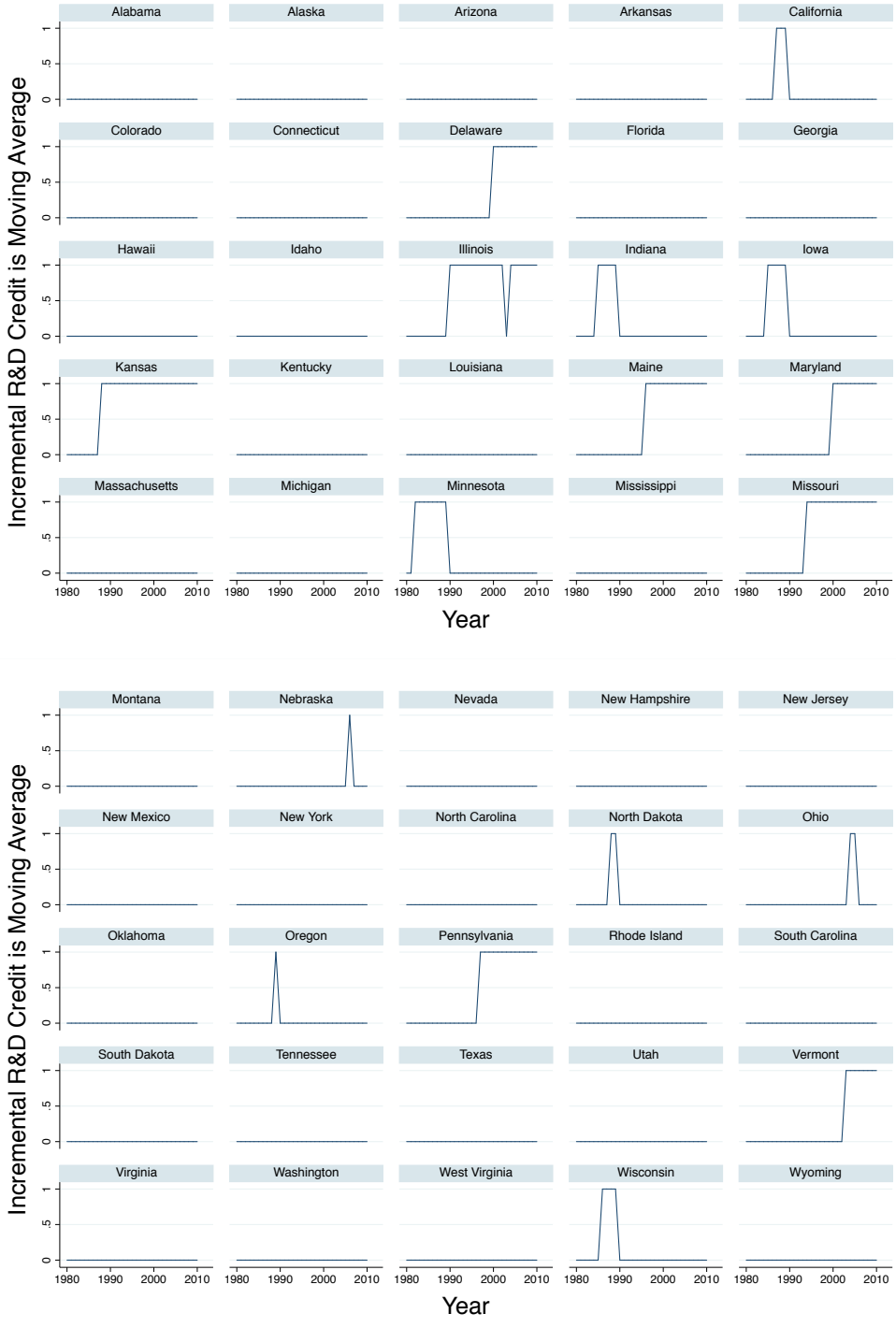
NOTES: This figure plots sales apportionment weights by state from 1980-2012. See Section 1 for details on data sources.

Figure A20: Franchise Tax By State-Year



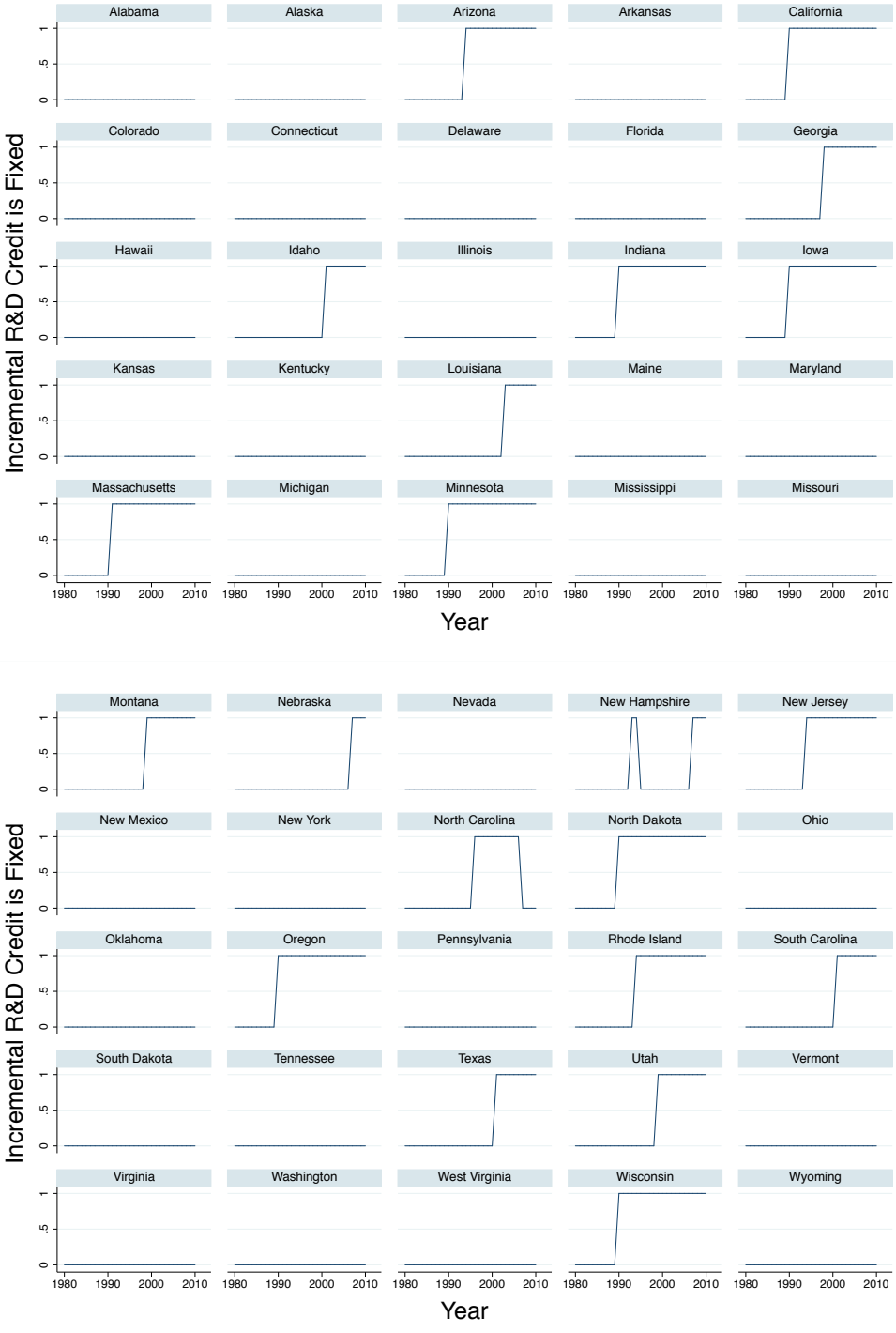
NOTES: This figure plots an indicator for franchise taxes by state from 1980-2012. See Section 1 for details on data sources.

Figure A21: Moving Average Base for Incremental R&D By State-Year



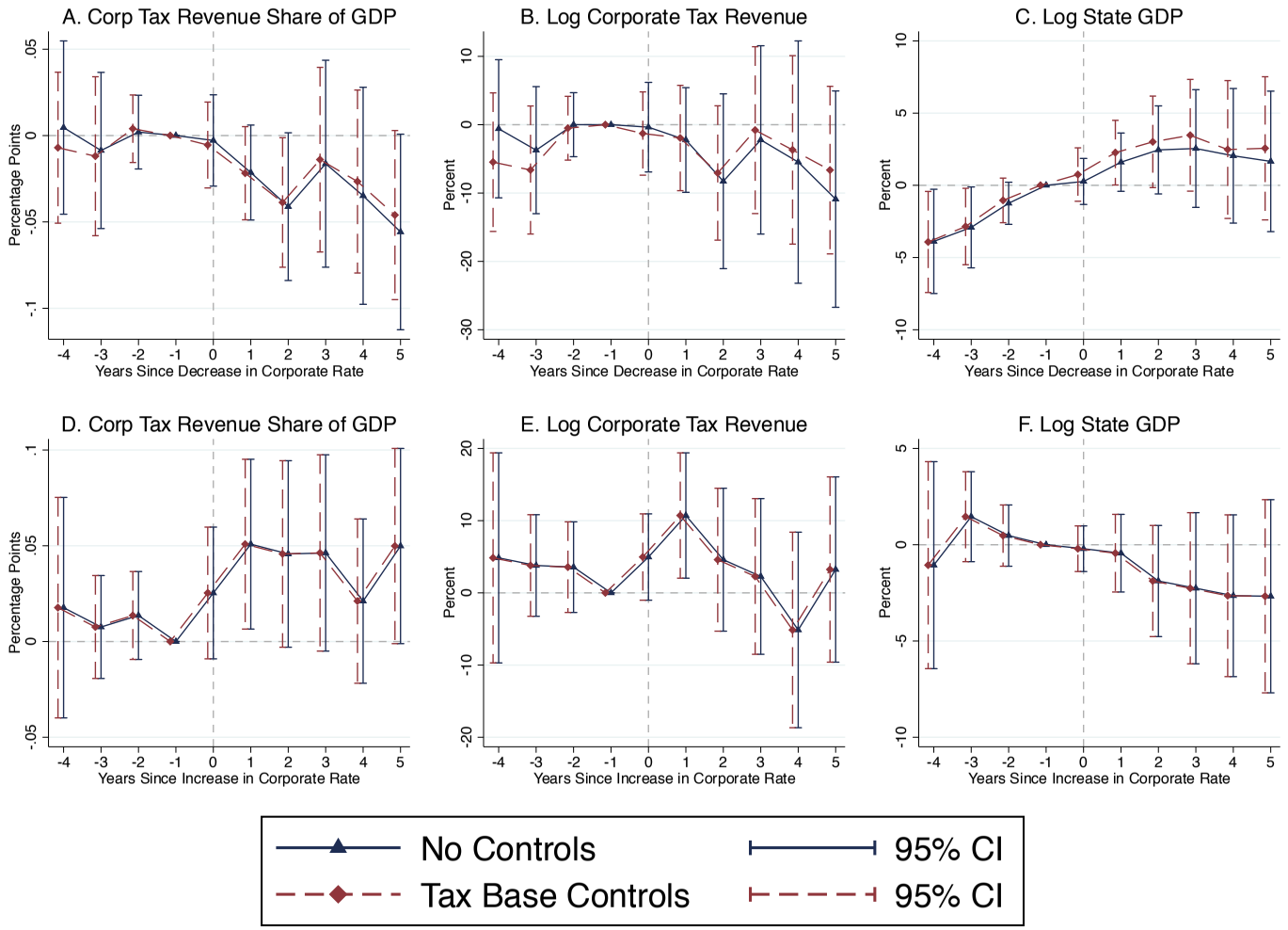
NOTES: This figure plots an indicator for whether the incremental R&D credit base is a moving average. Sample includes all 50 states from 1980-2010. See Section 1 for details on data sources.

Figure A22: Fixed Base for Incremental R&D By State-Year



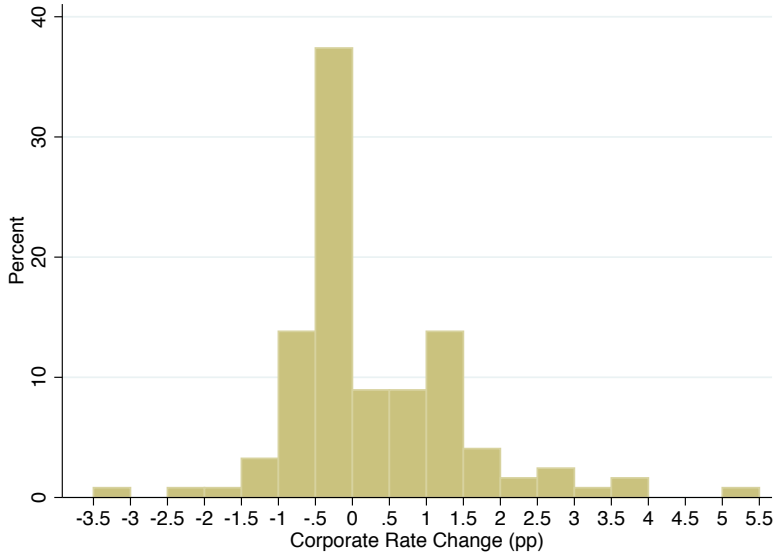
NOTES: This figure plots an indicator for whether the incremental R&D credit base is fixed. Sample includes all 50 states from 1980-2010. See Section 1 for details on data sources.

Figure A23: Event Analysis: Impact of Corporate Rate Changes of All Magnitudes on State Corporate Tax Revenue and GDP



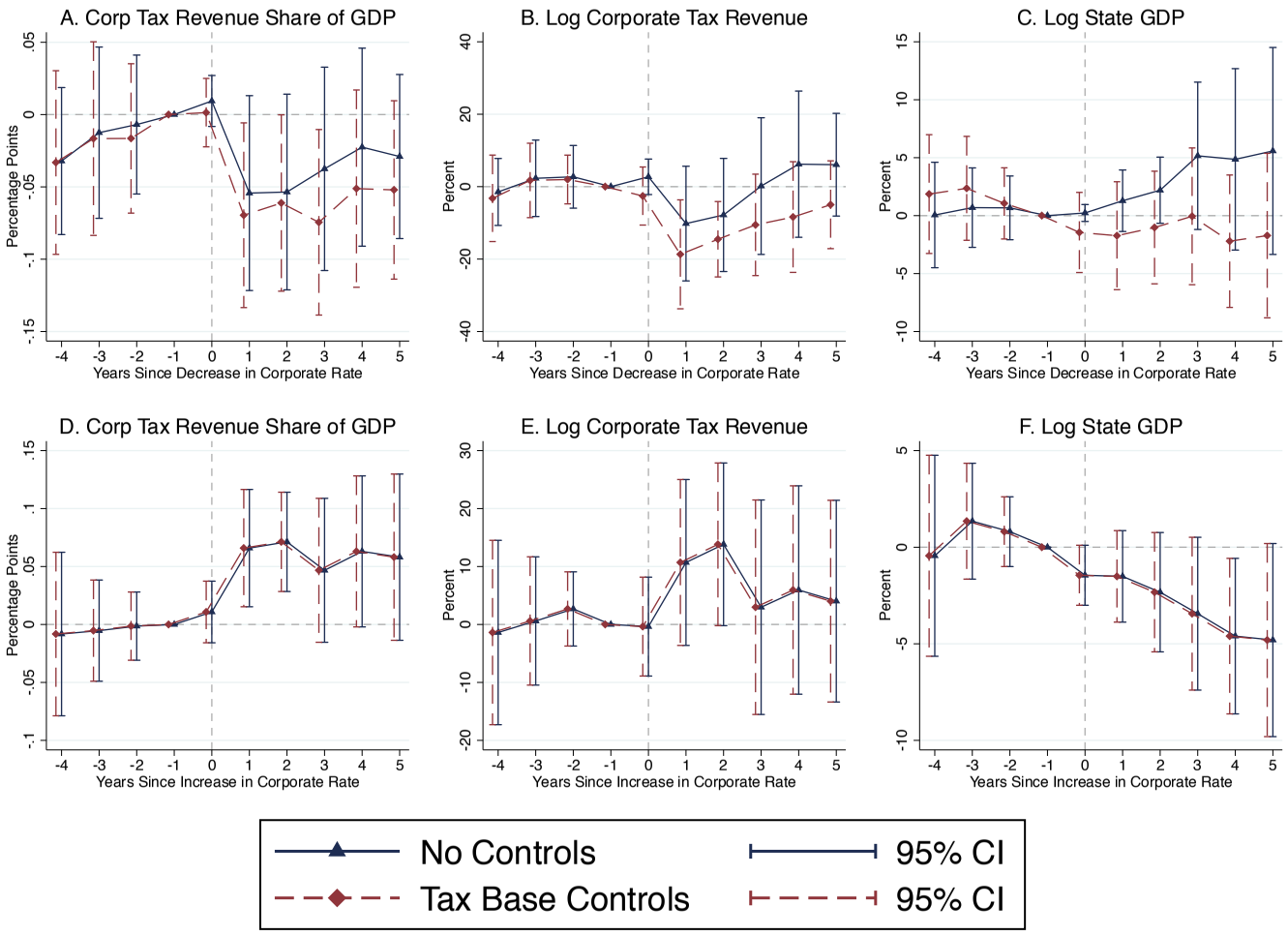
NOTES: This figure shows the effect of increases and decreases in the state corporate rate of any magnitude on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. The full navy line indicates a specification without additional controls. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources.

Figure A24: Histogram of State Corporate Rate Changes



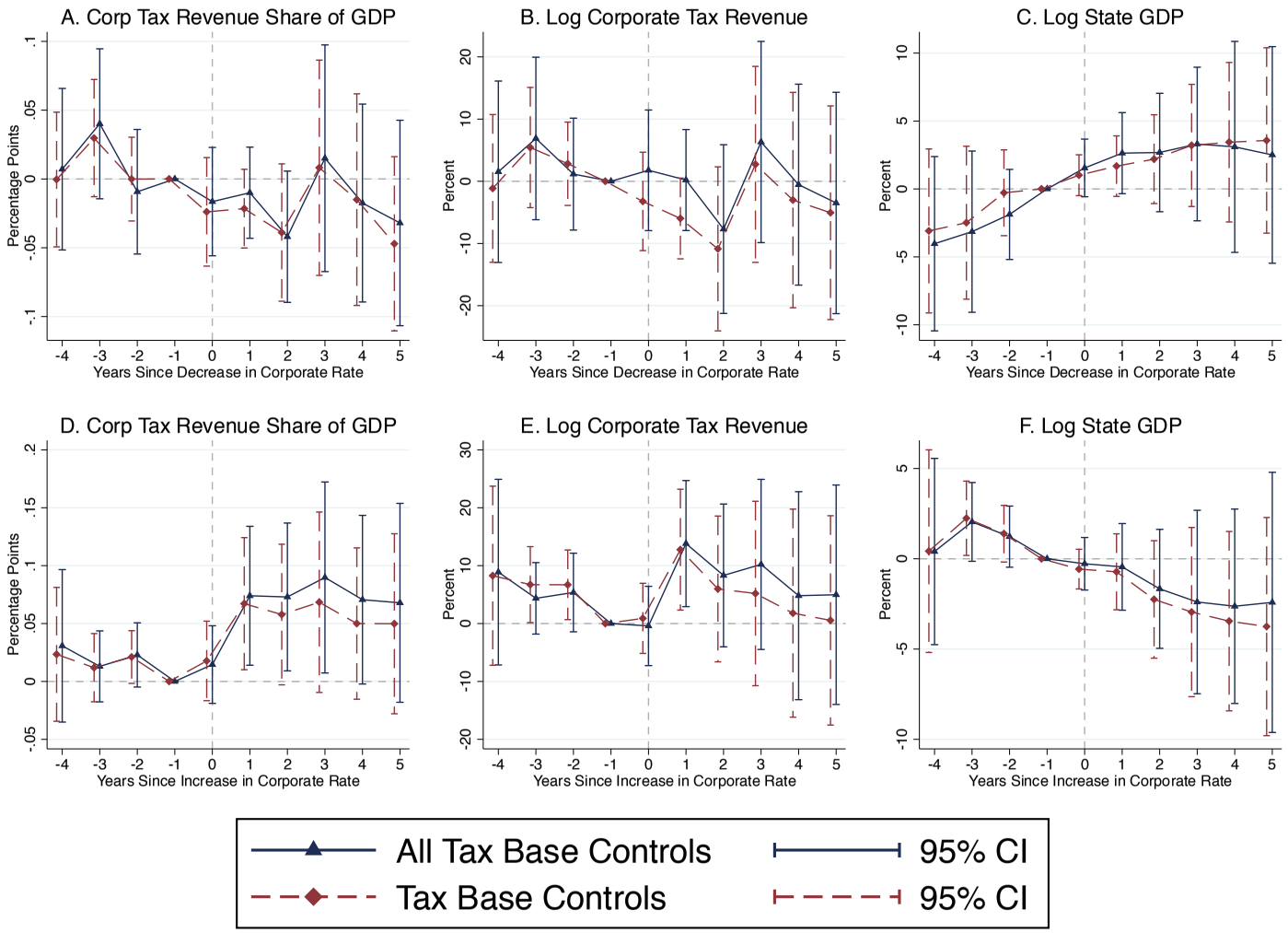
NOTES: This figure plots the magnitude of changes in the corporate tax rate across states between 1980 and 2010. Changes smaller than 0.5pp in absolute value make up 50.407% of all changes in the sample. See Section 1 for details on data sources.

Figure A25: Event Analysis: Impact of Selected Corporate Rate Changes on State Corporate Tax Revenue and GDP



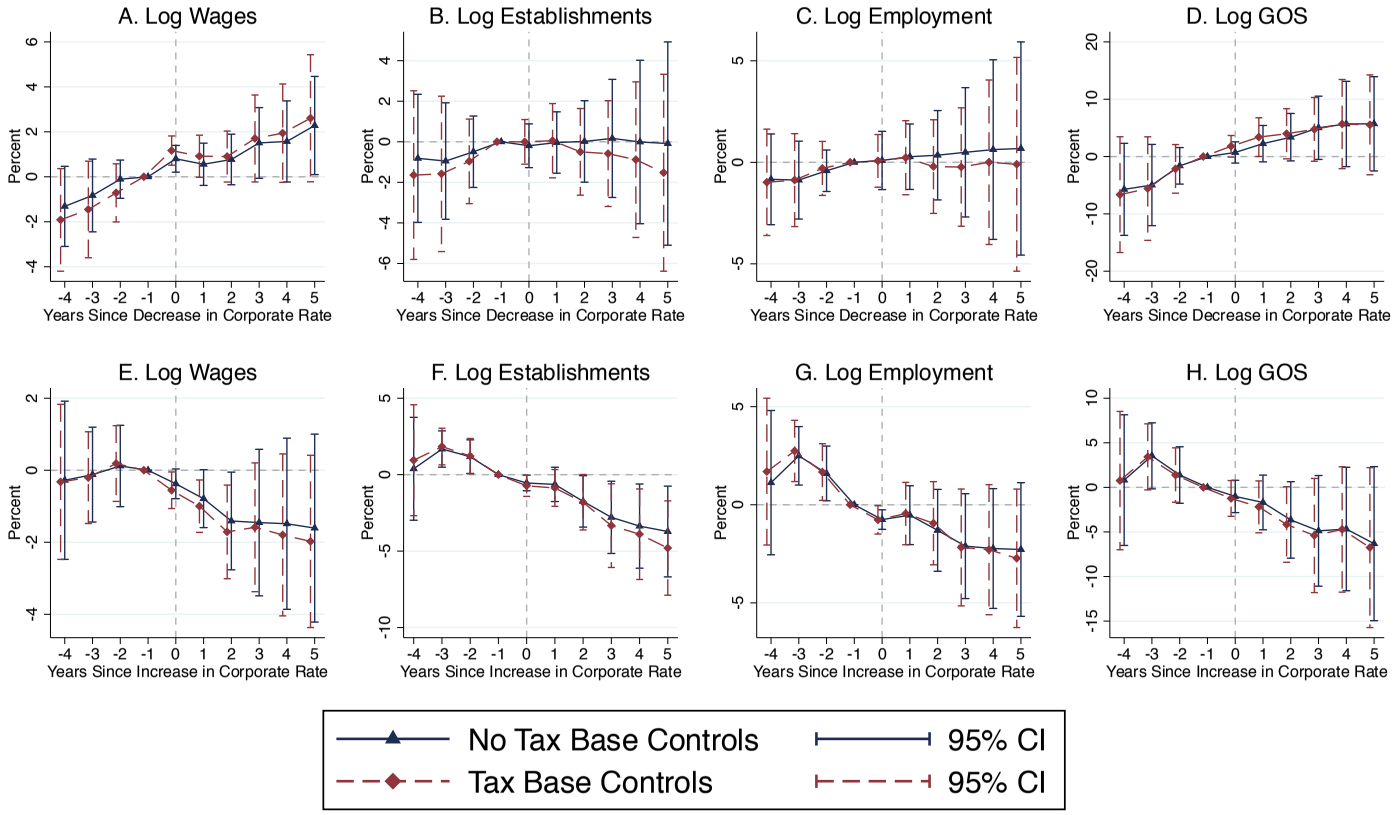
NOTES: This figure shows the effect of increases and decreases in the state corporate rate of at least 0.5pp for state corporate tax changes that Giroud and Rauh (2015) classify as exogenous. Year and state fixed effects are included in each specification. The full navy line indicates a specification without additional controls. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources.

Figure A26: Event Analysis: Impact on State Corporate Tax Revenue and GDP, All Tax Base Controls



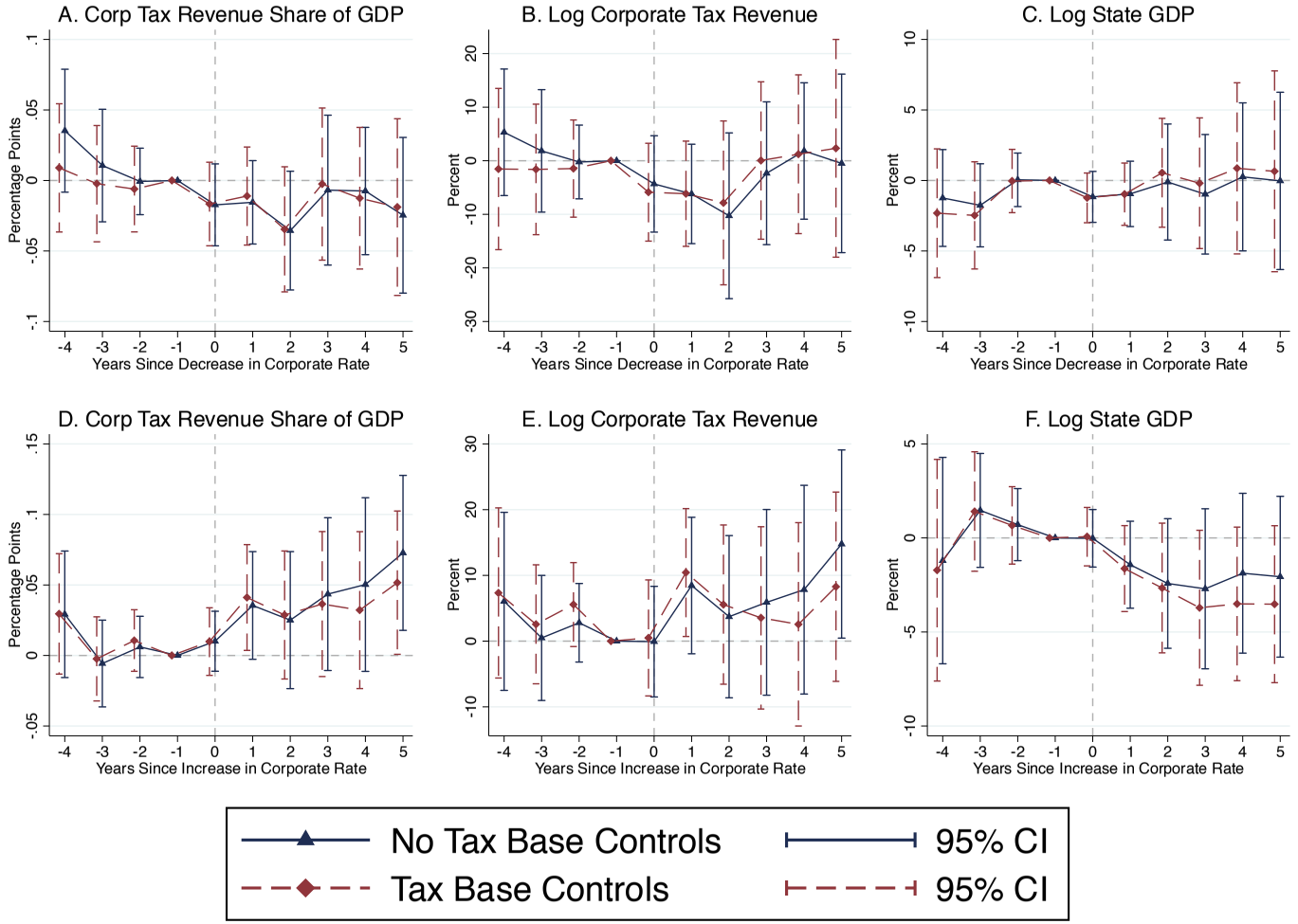
Notes: This figure shows the effect of increases and decreases in the state corporate rate of at least 0.5pp on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Year and state fixed effects are included in each specification. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax.The full navy line includes all tax base controls. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources.

Figure A27: Event Analysis: Impacts on State Wages, Establishments, Employment, and GOS



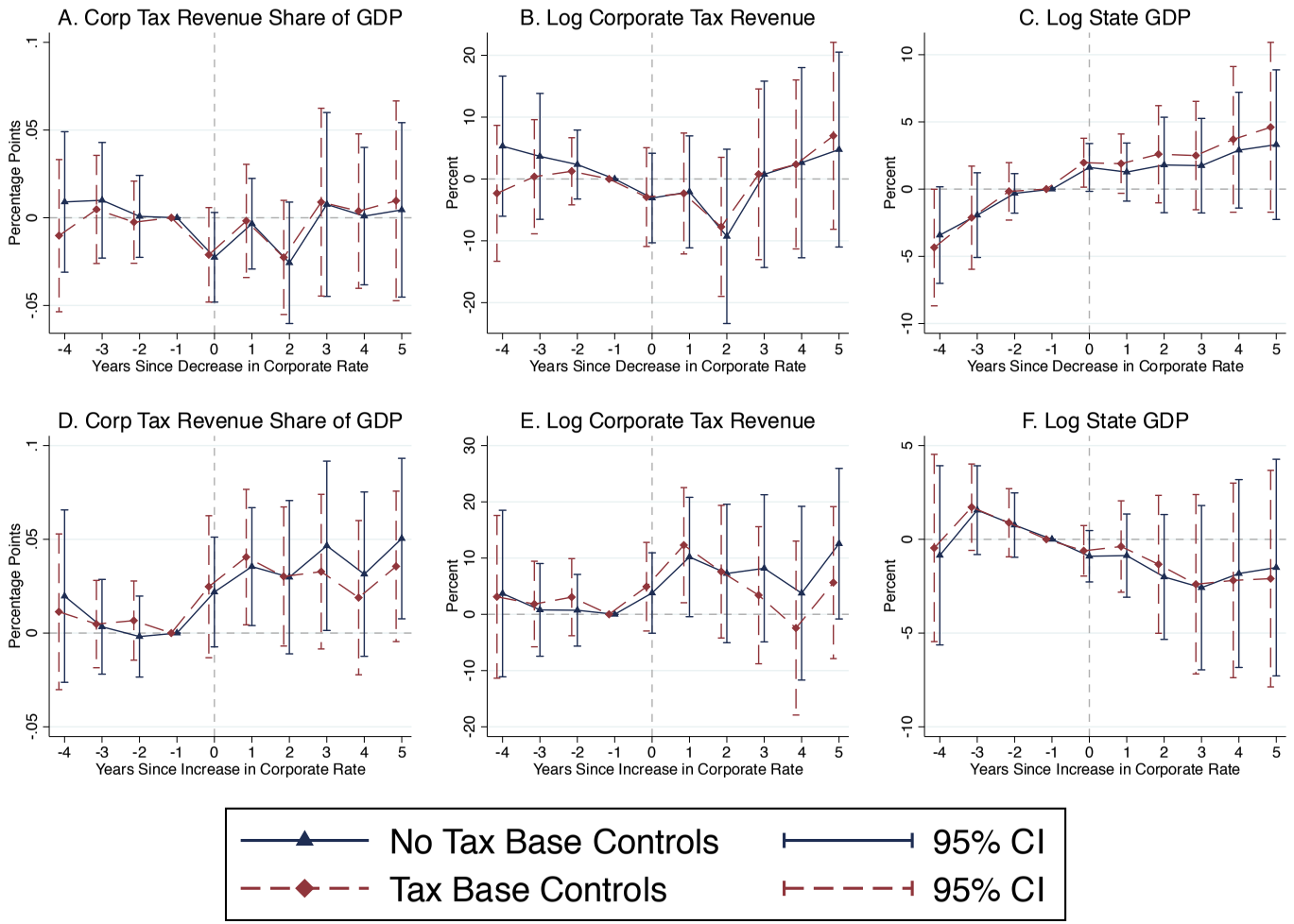
NOTES: This figure shows the effect of increases and decreases in the state corporate rate of at least 0.5pp on log state average wages, establishments, employment and gross operating surplus. Year and state fixed effects are included in each specification. The full navy line indicates a specification without additional controls. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax. Note that "wages" are the average earnings among workers in a state. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources.

Figure A28: Event Analysis: Impact on State Corporate Tax Revenue and GDP, Neighboring State Controls



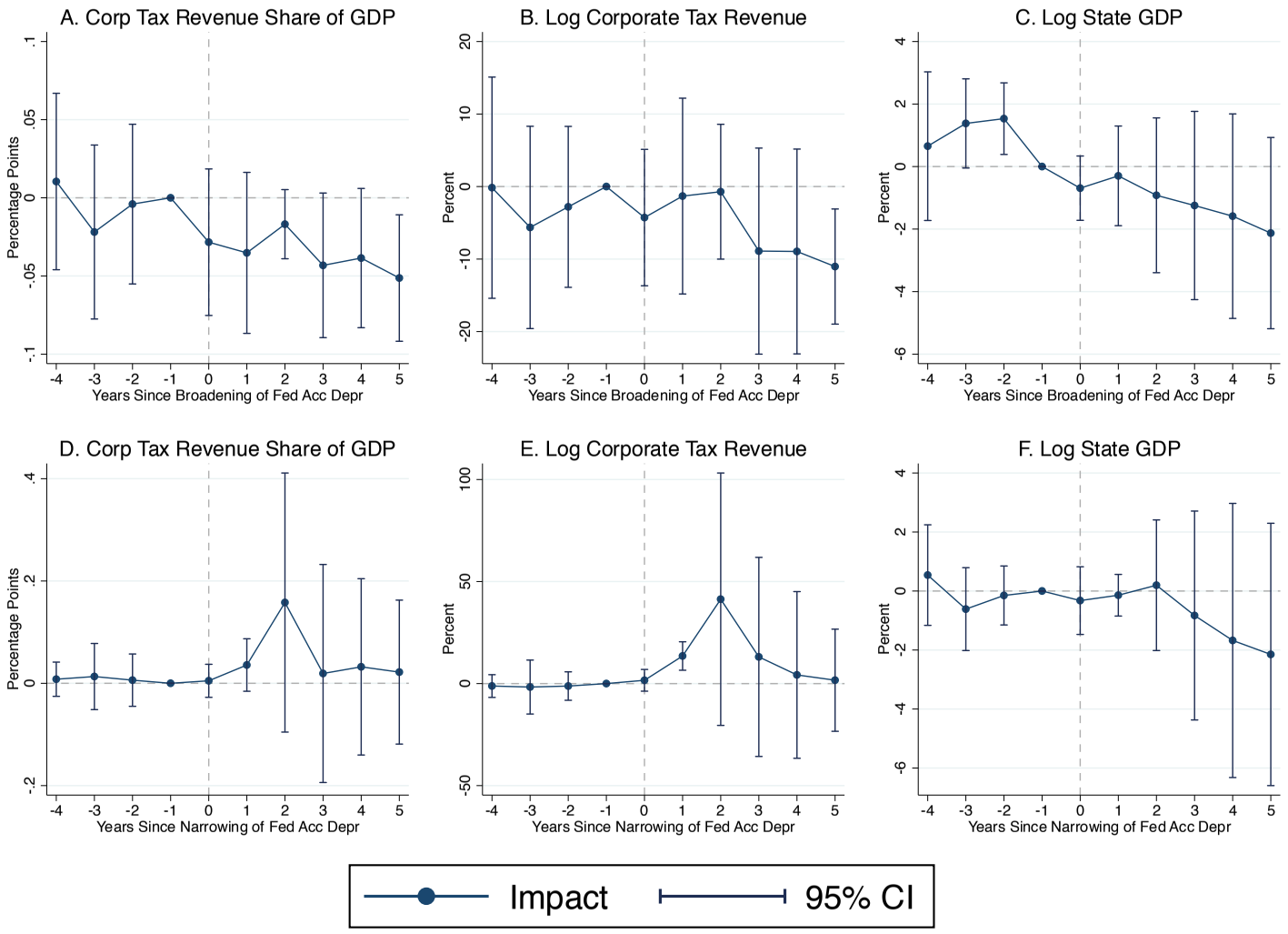
Notes: This figure shows the effect of increases and decreases in the state corporate rate of at least 0.5pp on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Leads and lags of corporate tax rate and tax base changes in neighboring states are included in each specification. Year and state fixed effects are also included. The full navy line indicates a specification without additional controls. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. Neighboring states are states that share a border, as defined in Section B.2. See Section 1 for details on data sources.

Figure A29: Event Analysis: Impact on State Corporate Tax Revenue and GDP, Similar State Controls



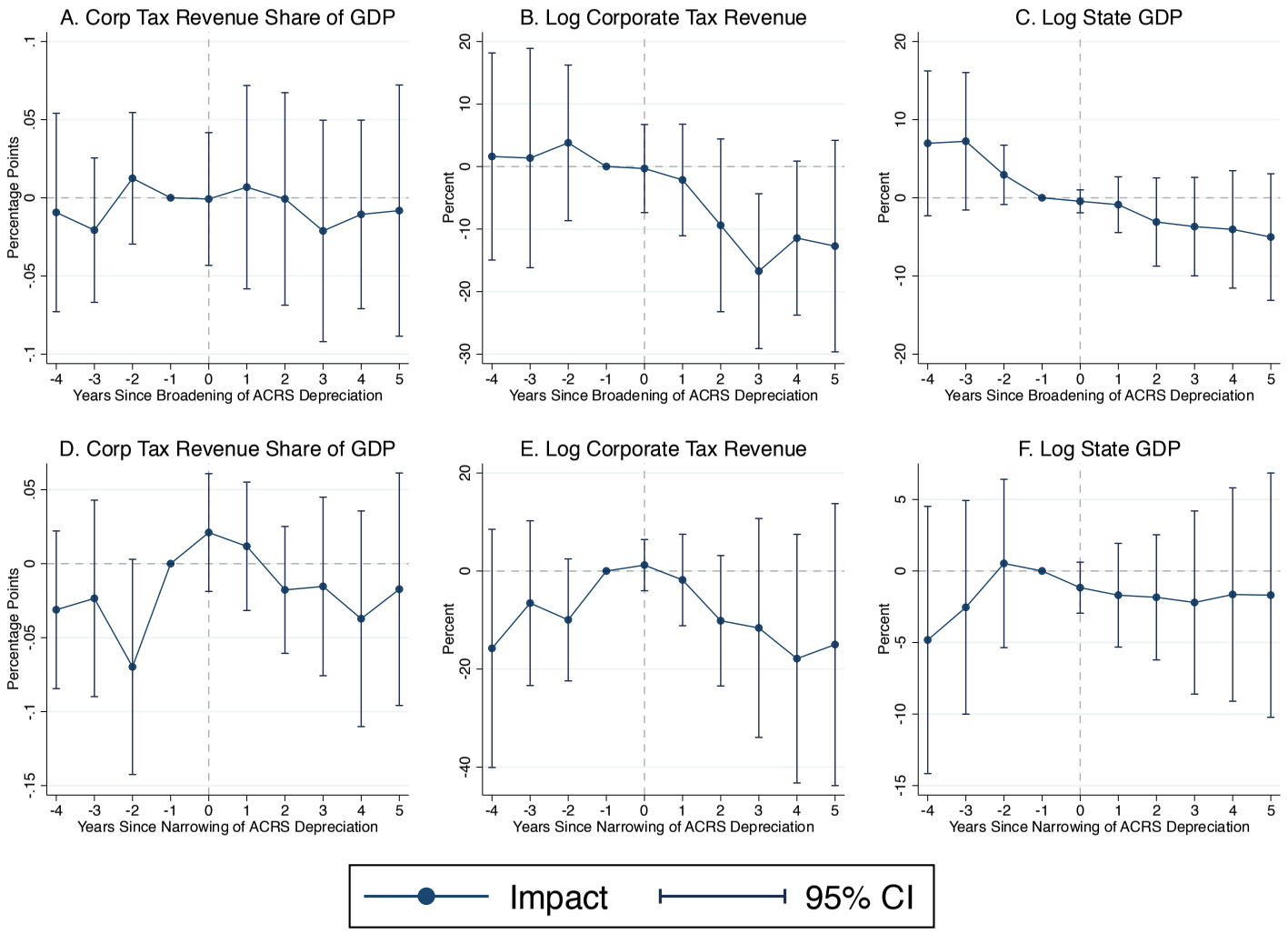
NOTES: This figure shows the effect of increases and decreases in the state corporate rate of at least 0.5pp on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Leads and lags of corporate tax rate and tax base changes in similar states are included in each specification. Year and state fixed effects are also included. The full navy line indicates a specification without additional controls. The dashed red line plots the coefficients from a specification that additionally controls for the following tax base rules: federal income tax treated as state base, sales apportionment weight, throwback rules, federal income tax deductibility, loss carryforward, and franchise tax. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. We construct an artificial similar state using the most similar state the year before an event, as defined in Section B.2. See Section 1 for details on data sources.

Figure A30: Event Analysis: Impacts of Federal Accelerated Depreciation Changes on Revenue and GDP



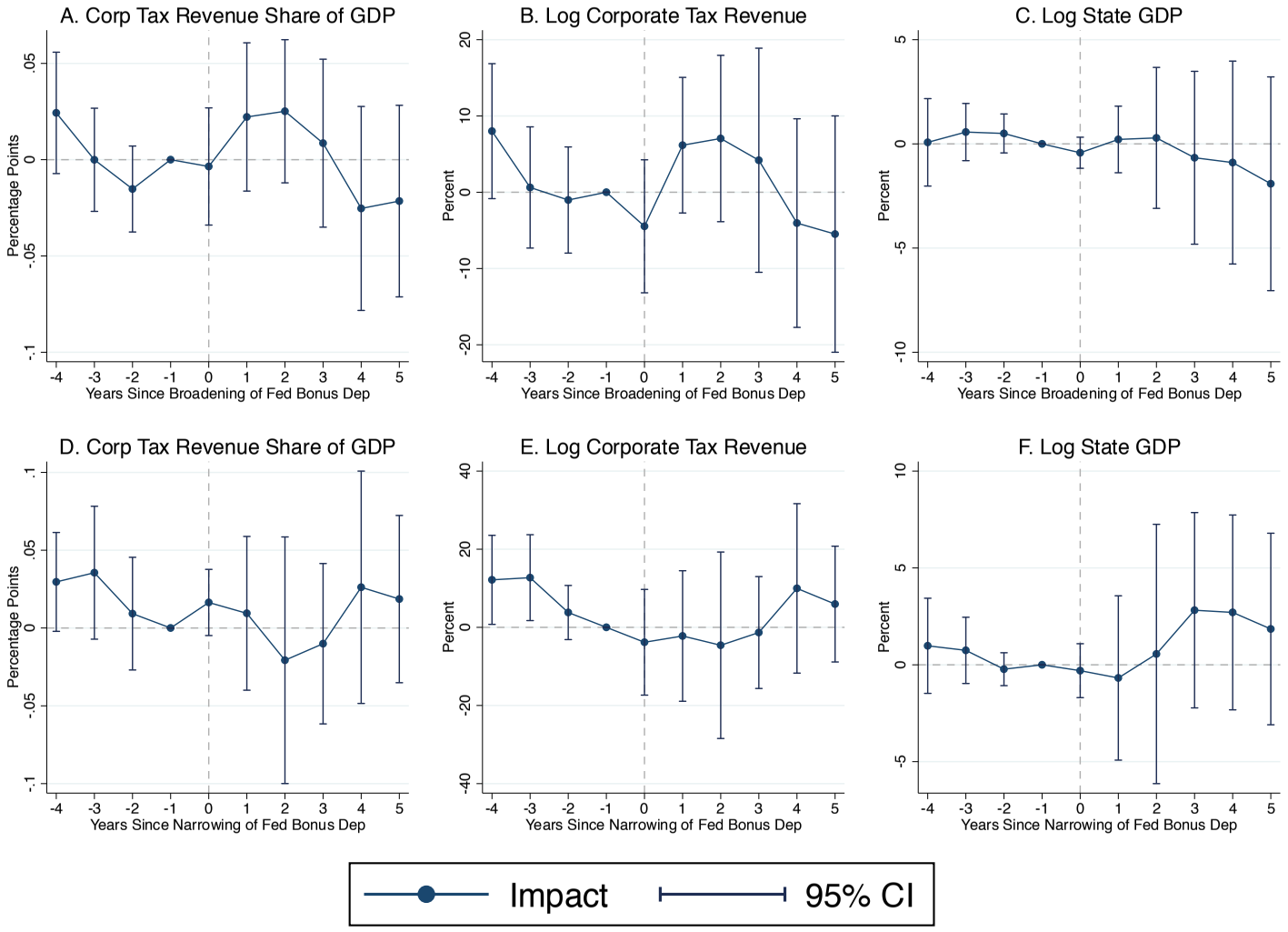
NOTES: This figure shows the effect of broadening and narrowing of whether the state allows federal accelerated depreciation on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Appendix A for detailed definitions of broadening and narrowing for each measure. See Section 1 for details on data sources.

Figure A31: Event Analysis: Impacts of ACRS Depreciation Changes on Revenue and GDP



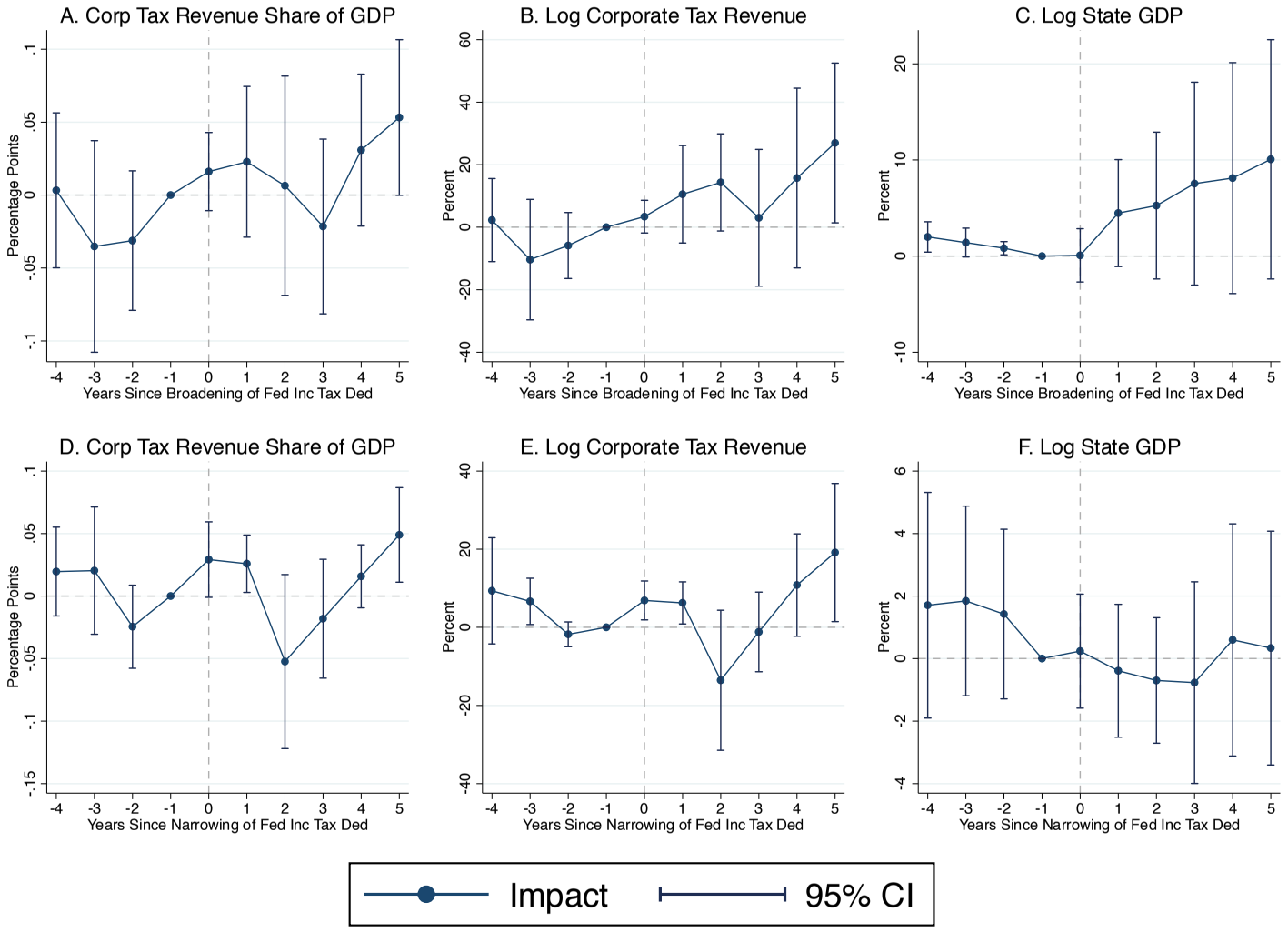
NOTES: This figure shows the effect of broadening and narrowing of whether the state allows ACRS depreciation on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A32: Event Analysis: Impacts of Federal Bonus Depreciation Changes on Revenue and GDP



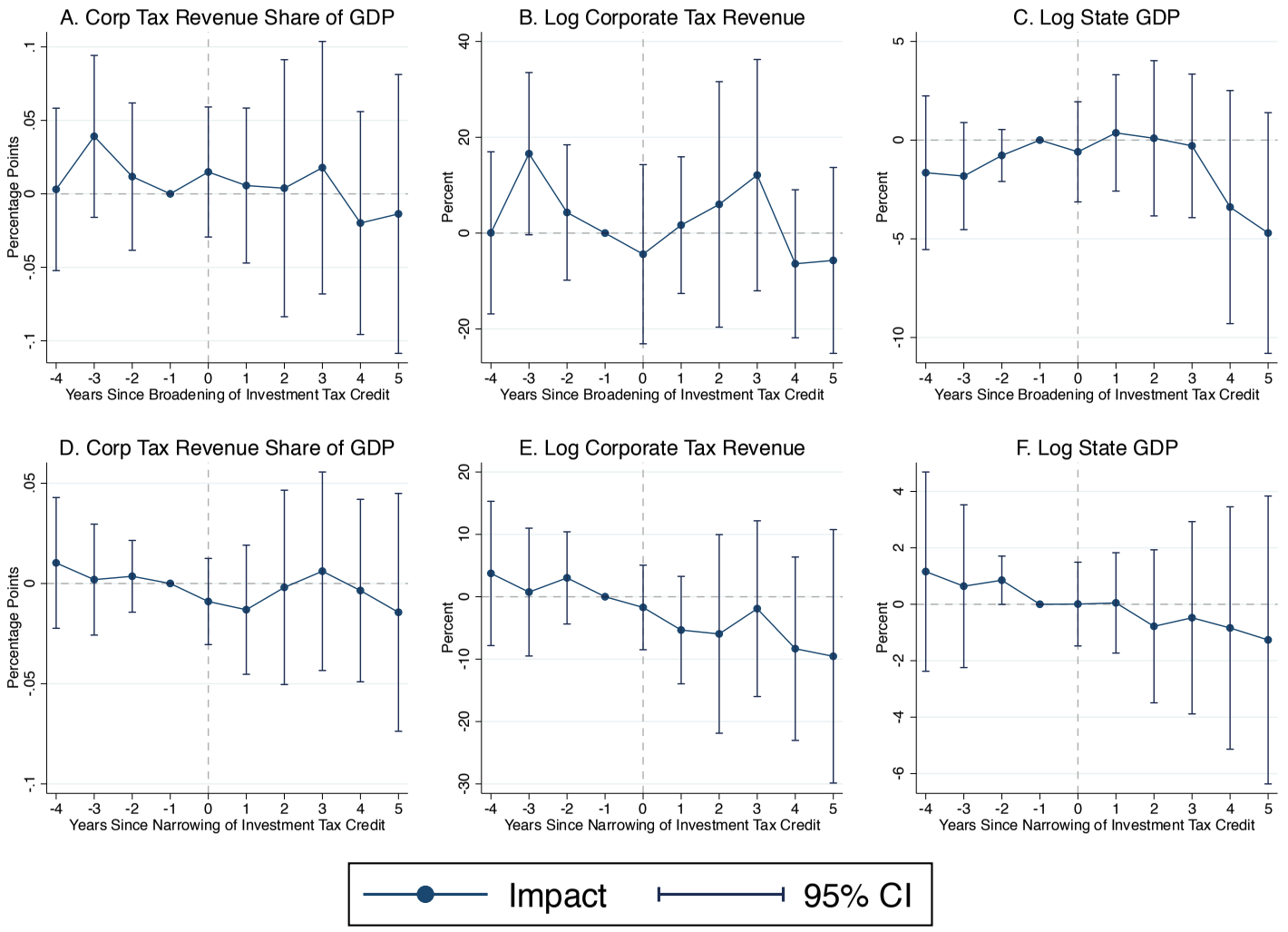
NOTES: This figure shows the effect of broadening and narrowing of whether the state allows federal bonus depreciation on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A33: Event Analysis: Impacts of Federal Income Tax Deductibility Changes on Revenue and GDP



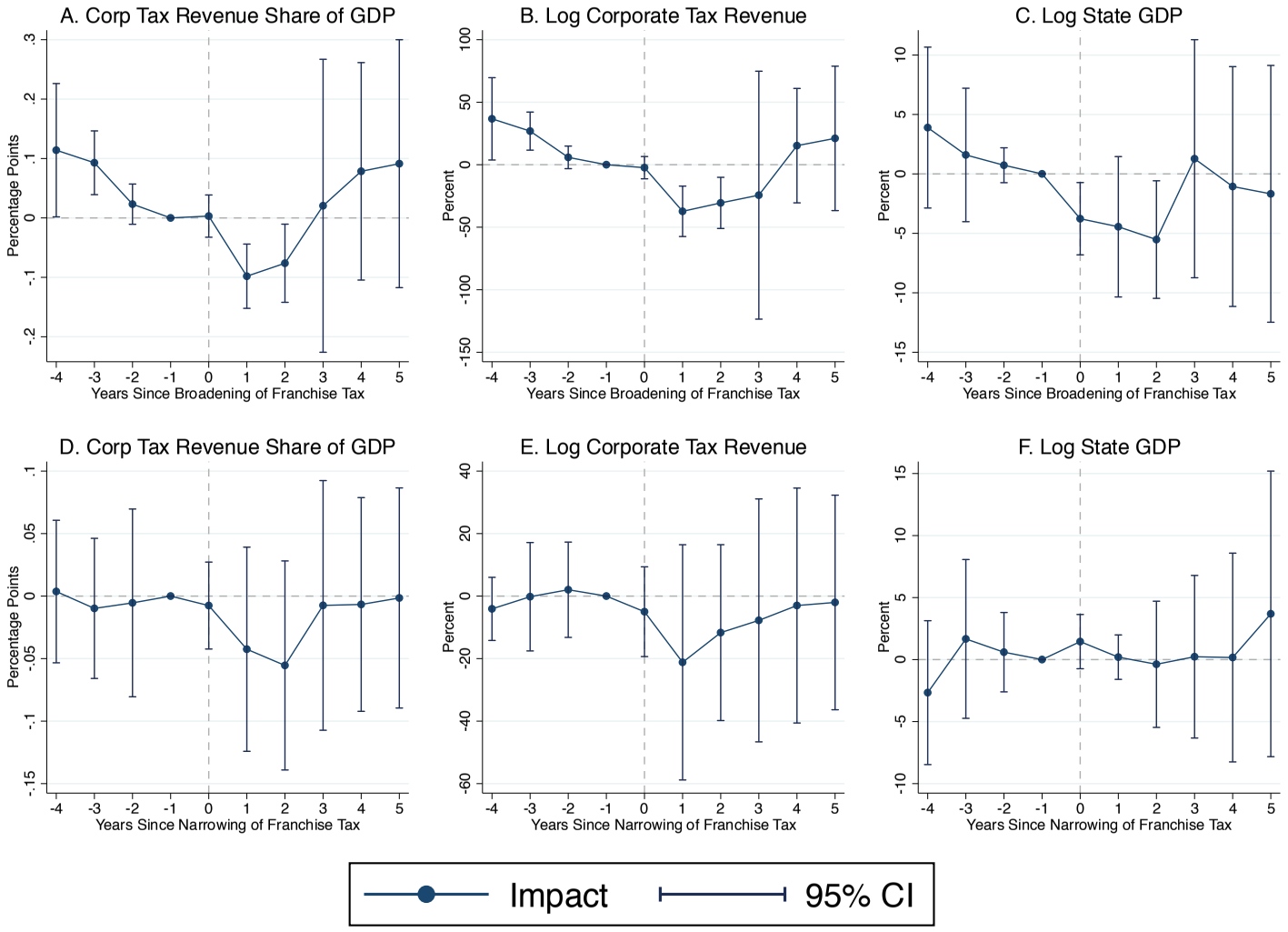
NOTES: This figure shows the effect of broadening and narrowing of whether federal income tax is deductible on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A34: Event Analysis: Impacts of Investment Tax Credit Changes on Revenue and GDP



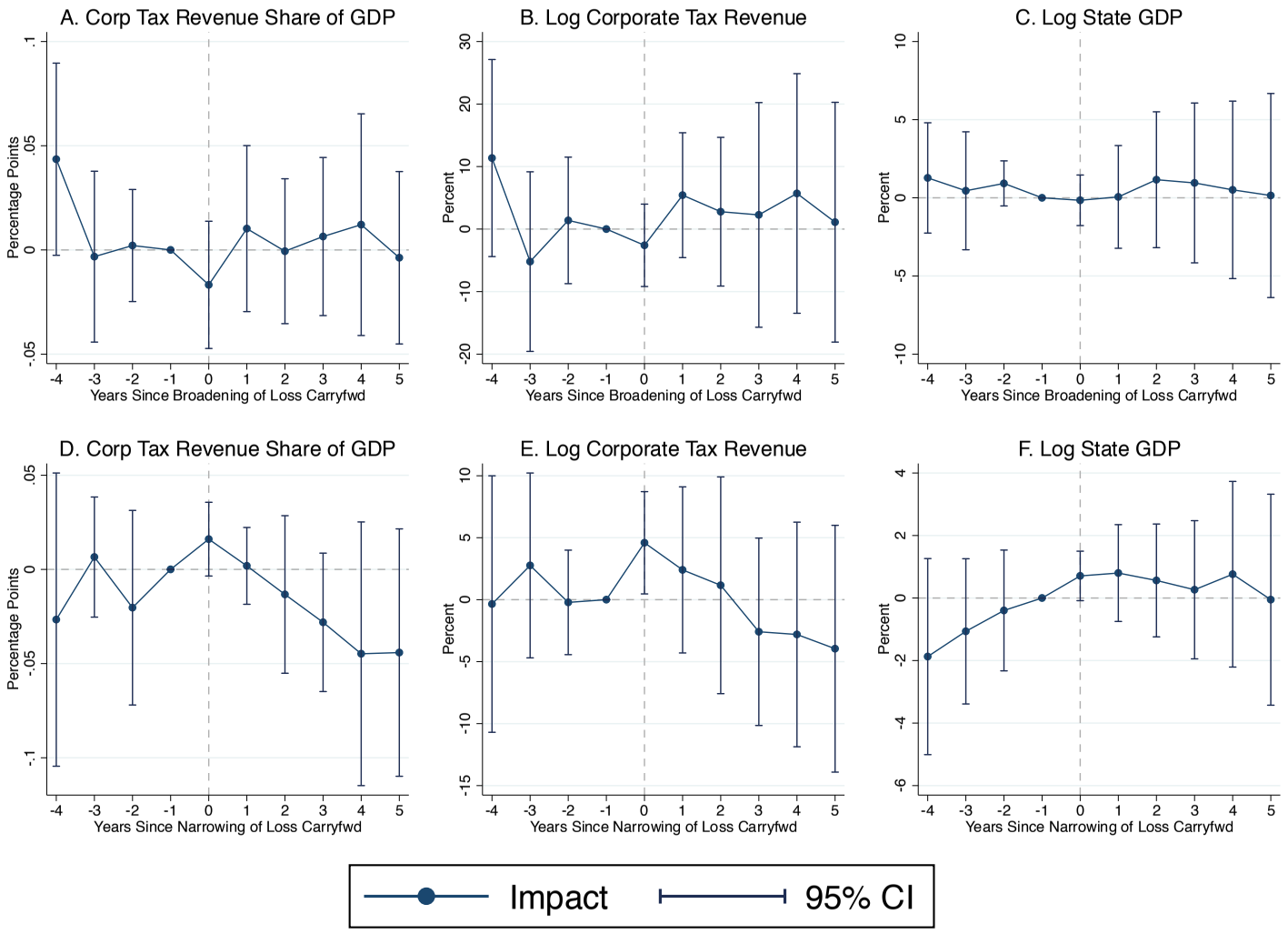
Notes: This figure shows the effect of broadening and narrowing of investment tax credits on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A35: Event Analysis: Impacts of Franchise Tax Changes on Revenue and GDP



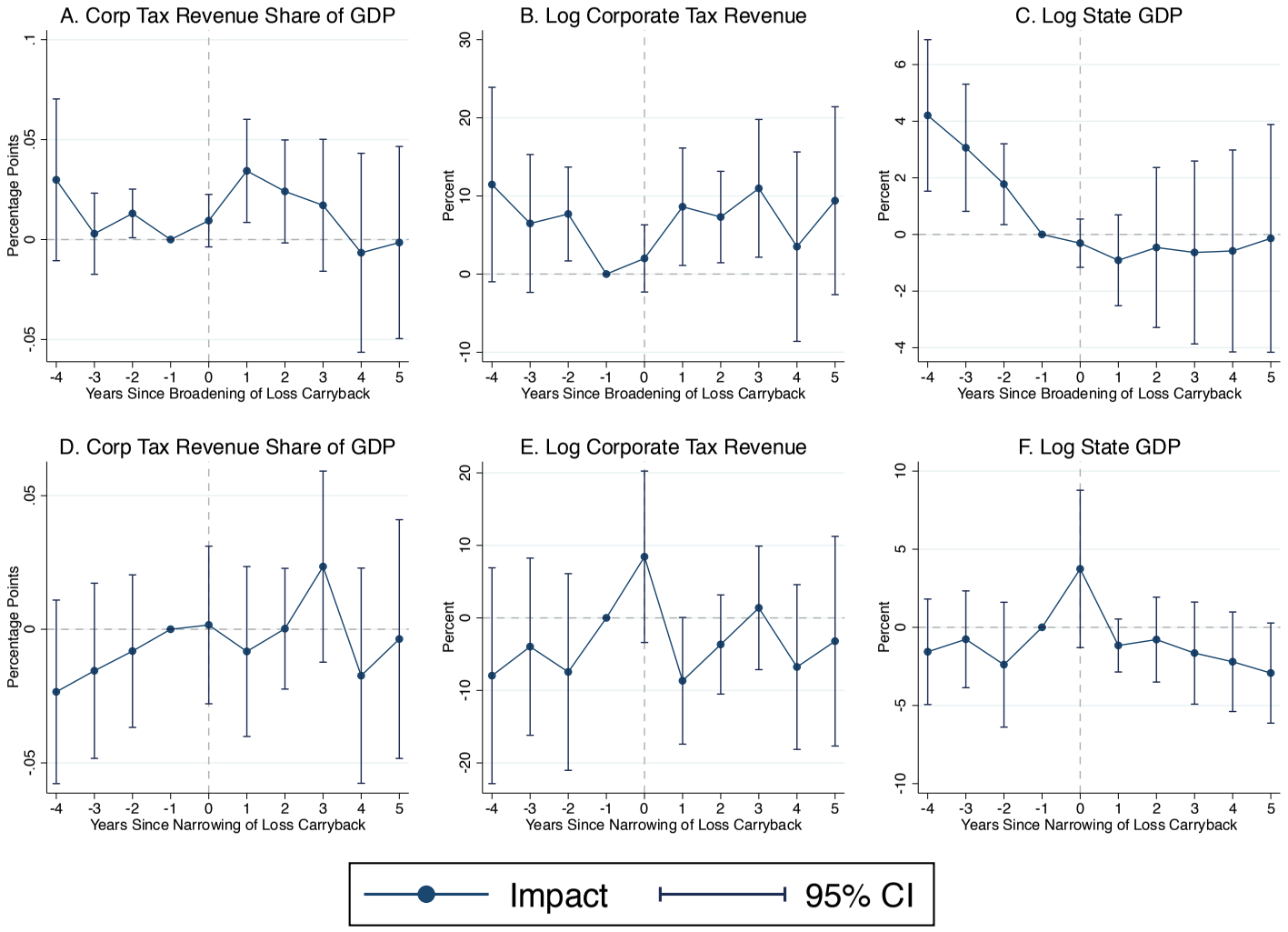
Notes: This figure shows the effect of broadening and narrowing of whether the state has a franchise tax on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A36: Event Analysis: Impacts of Loss Carryforward Changes on Revenue and GDP



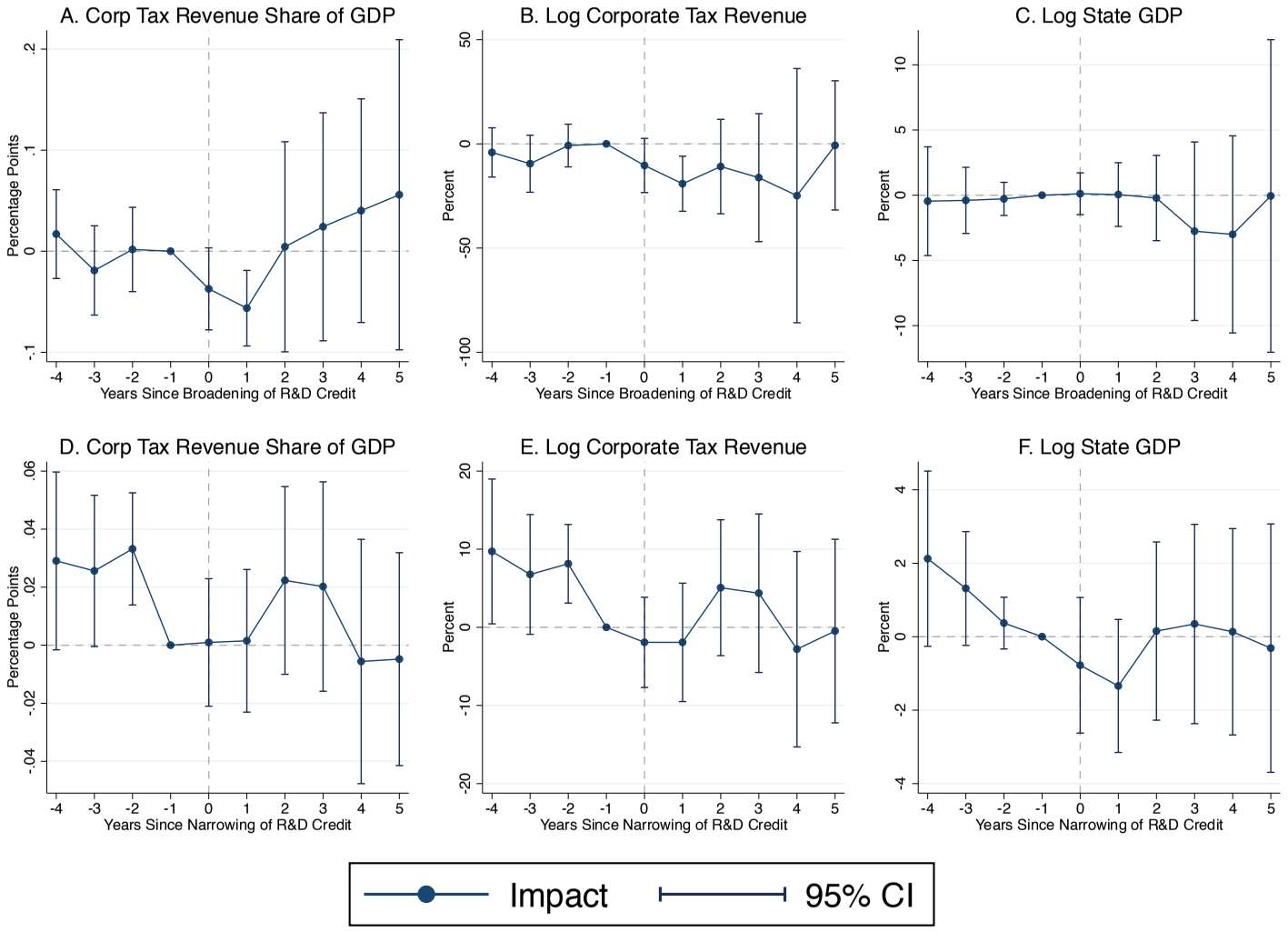
NOTES: This figure shows the effect of broadening and narrowing of loss carryforward years on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A37: Event Analysis: Impacts of Loss Carryback Changes on Revenue and GDP



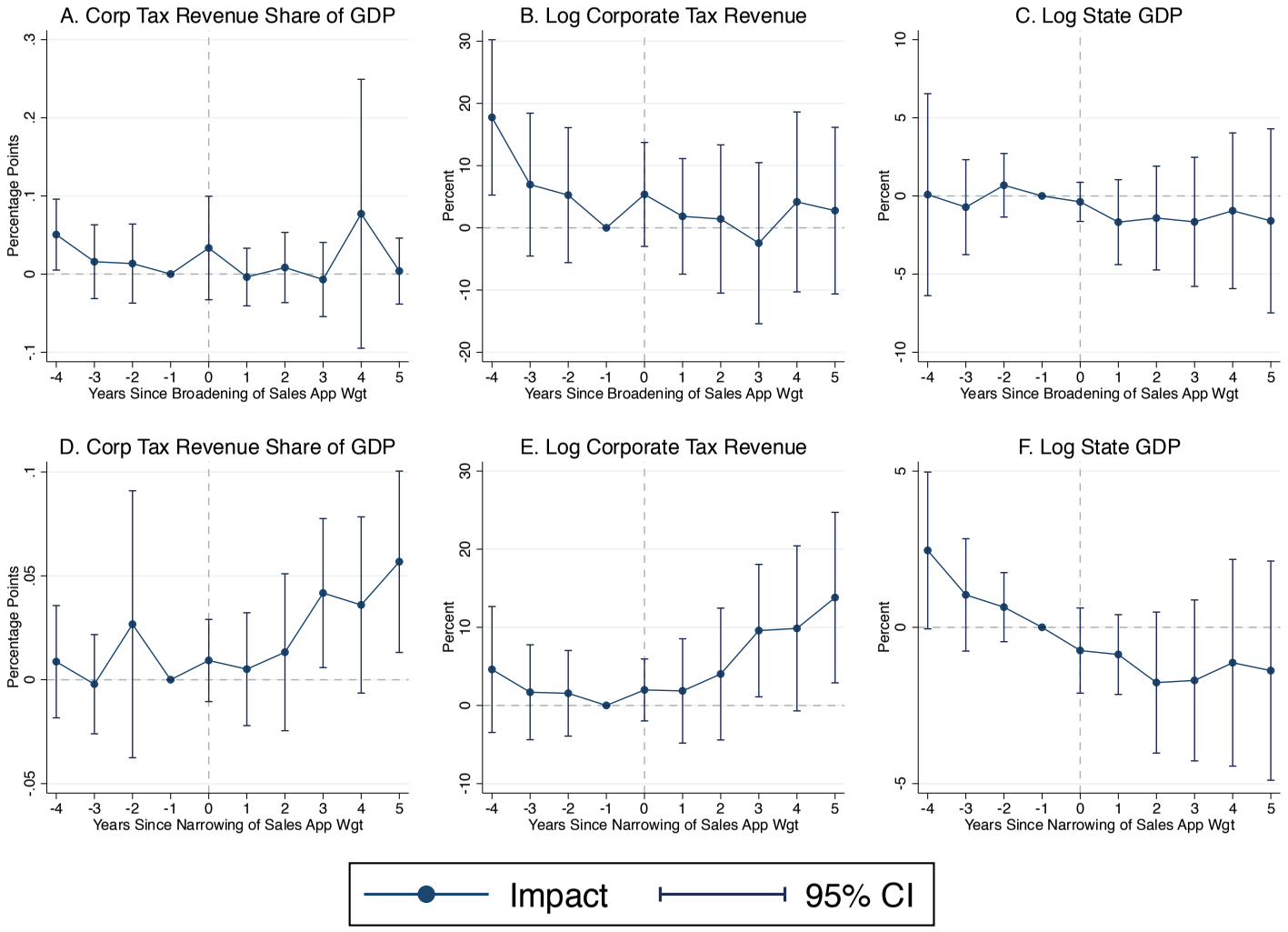
Notes: This figure shows the effect of broadening and narrowing of loss carryback years on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A38: Event Analysis: Impacts of R&D Credit Changes on Revenue and GDP



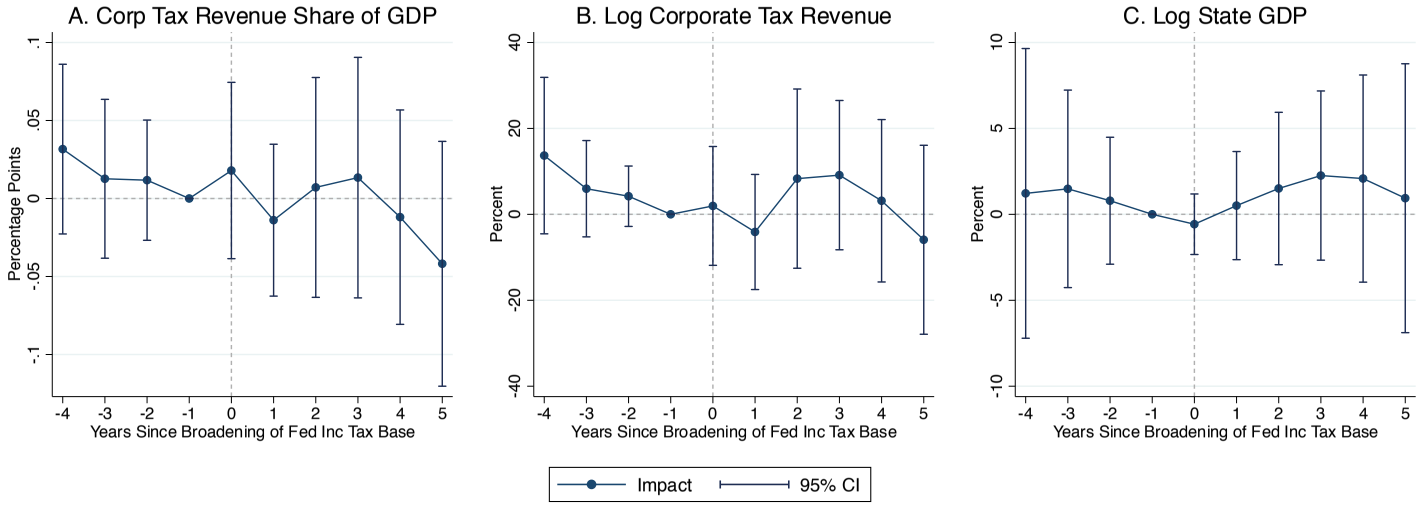
Notes: This figure shows the effect of broadening and narrowing of R&D tax credits on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A39: Event Analysis: Impacts of Sales Apportionment Weight Changes on Revenue and GDP



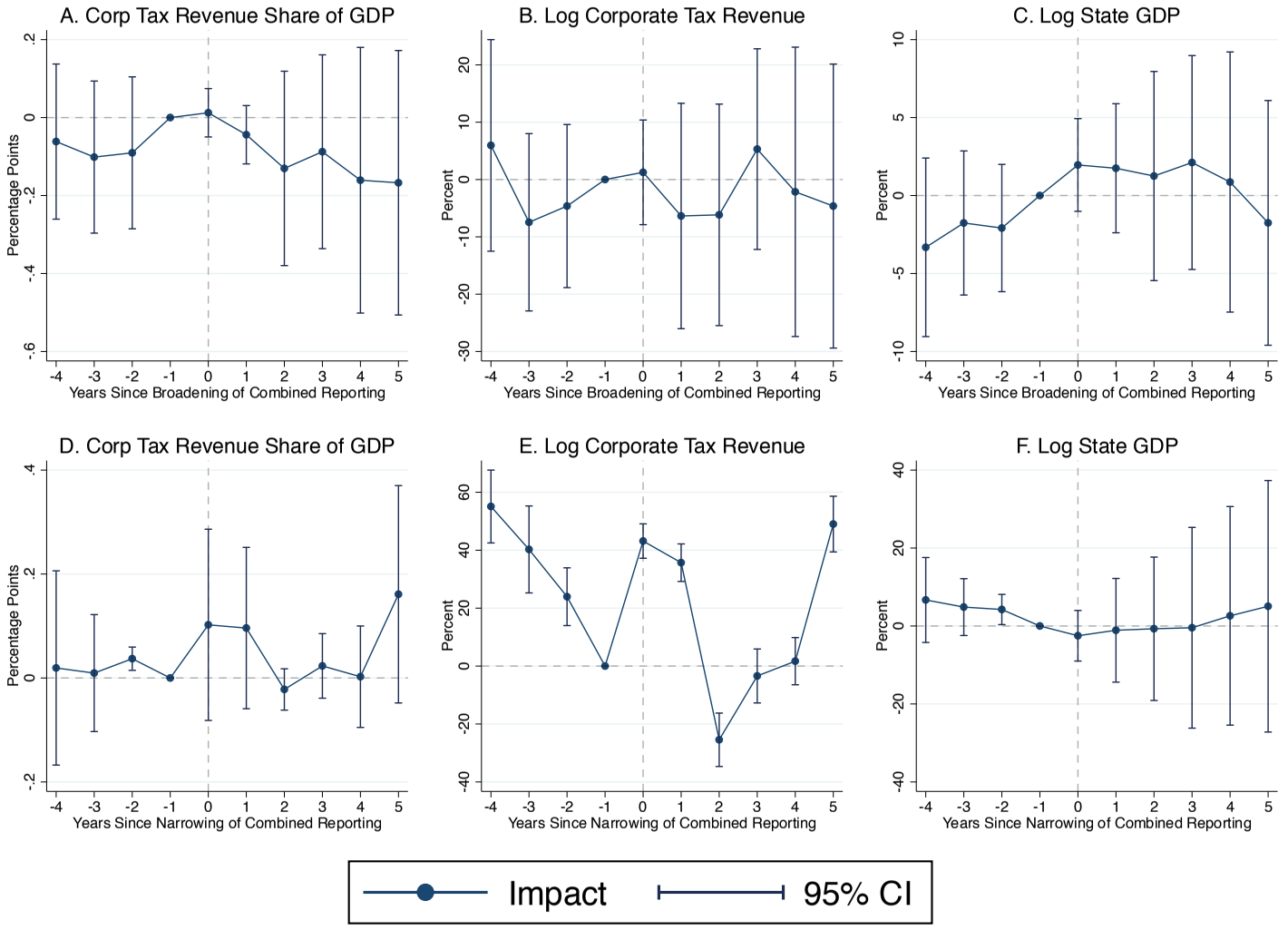
Notes: This figure shows the effect of broadening and narrowing of sales apportionment weights on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A40: Event Analysis: Impacts of Federal Income as State Base Changes on Revenue and GDP



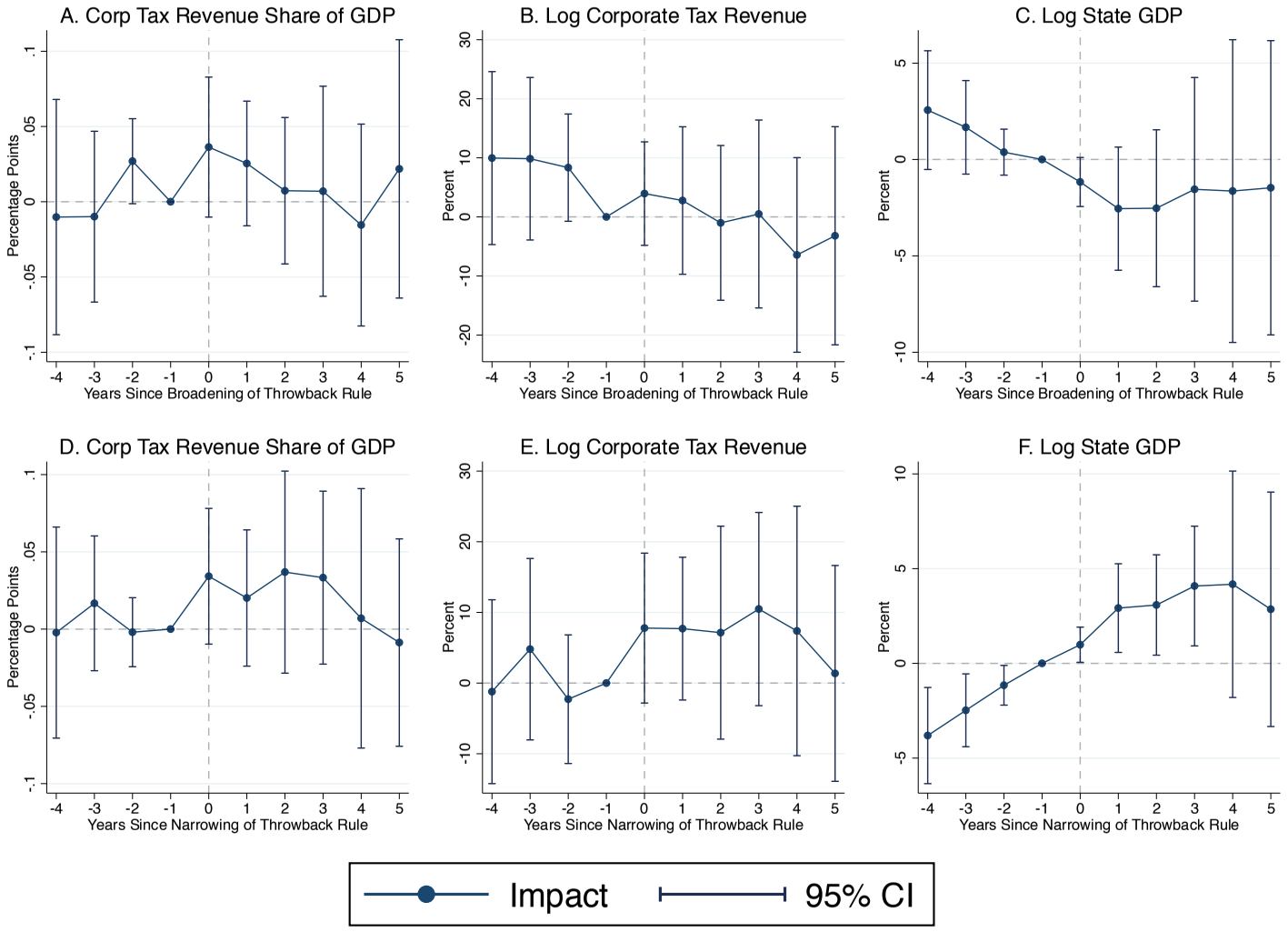
NOTES: This figure shows the effect of broadening and narrowing of whether states use federal income as the tax base on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A41: Event Analysis: Impacts of Combined Reporting Changes on Revenue and GDP



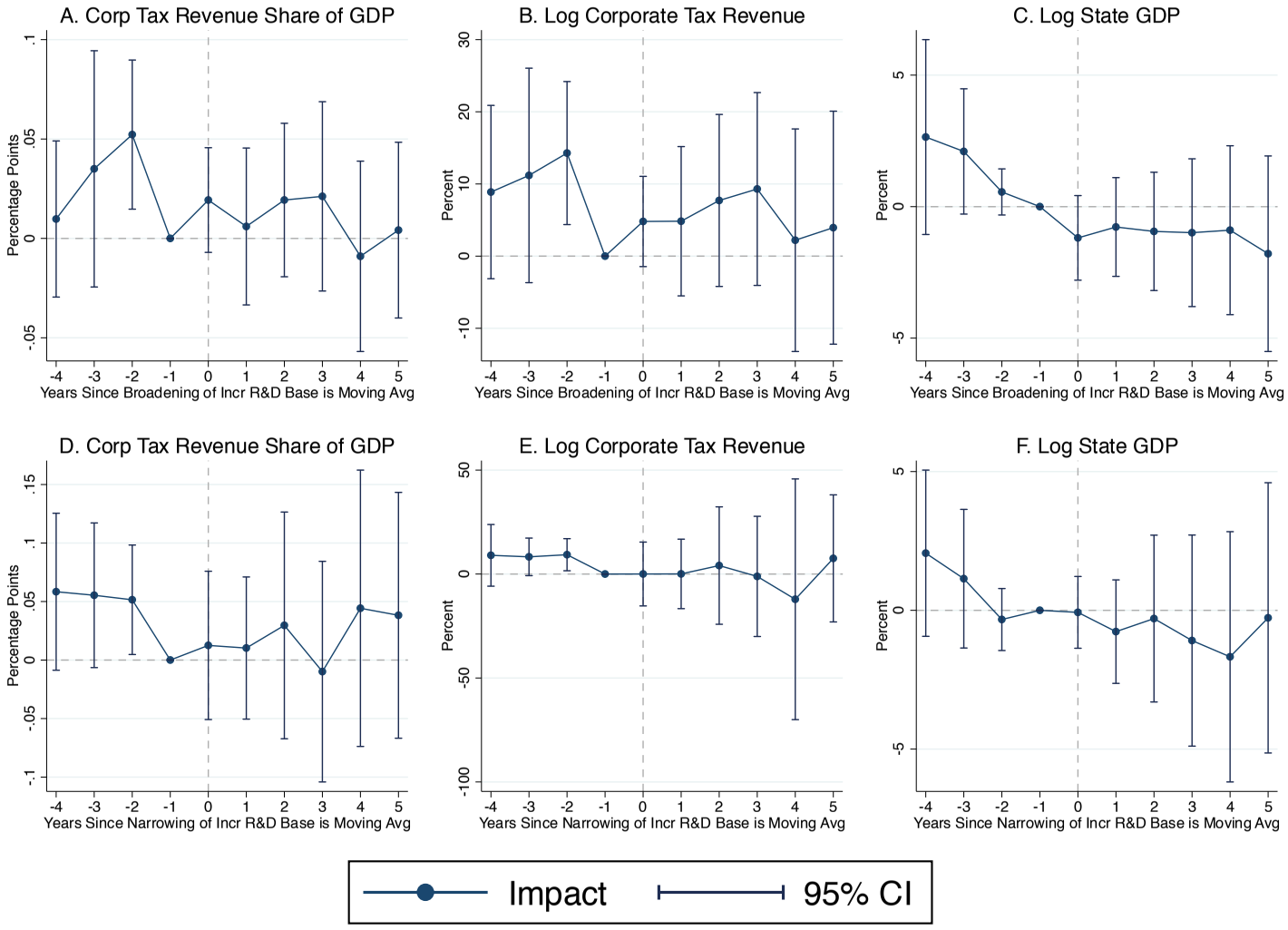
Notes: This figure shows the effect of broadening and narrowing of combined reporting on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A42: Event Analysis: Impacts of Throwback Rule Changes on Revenue and GDP



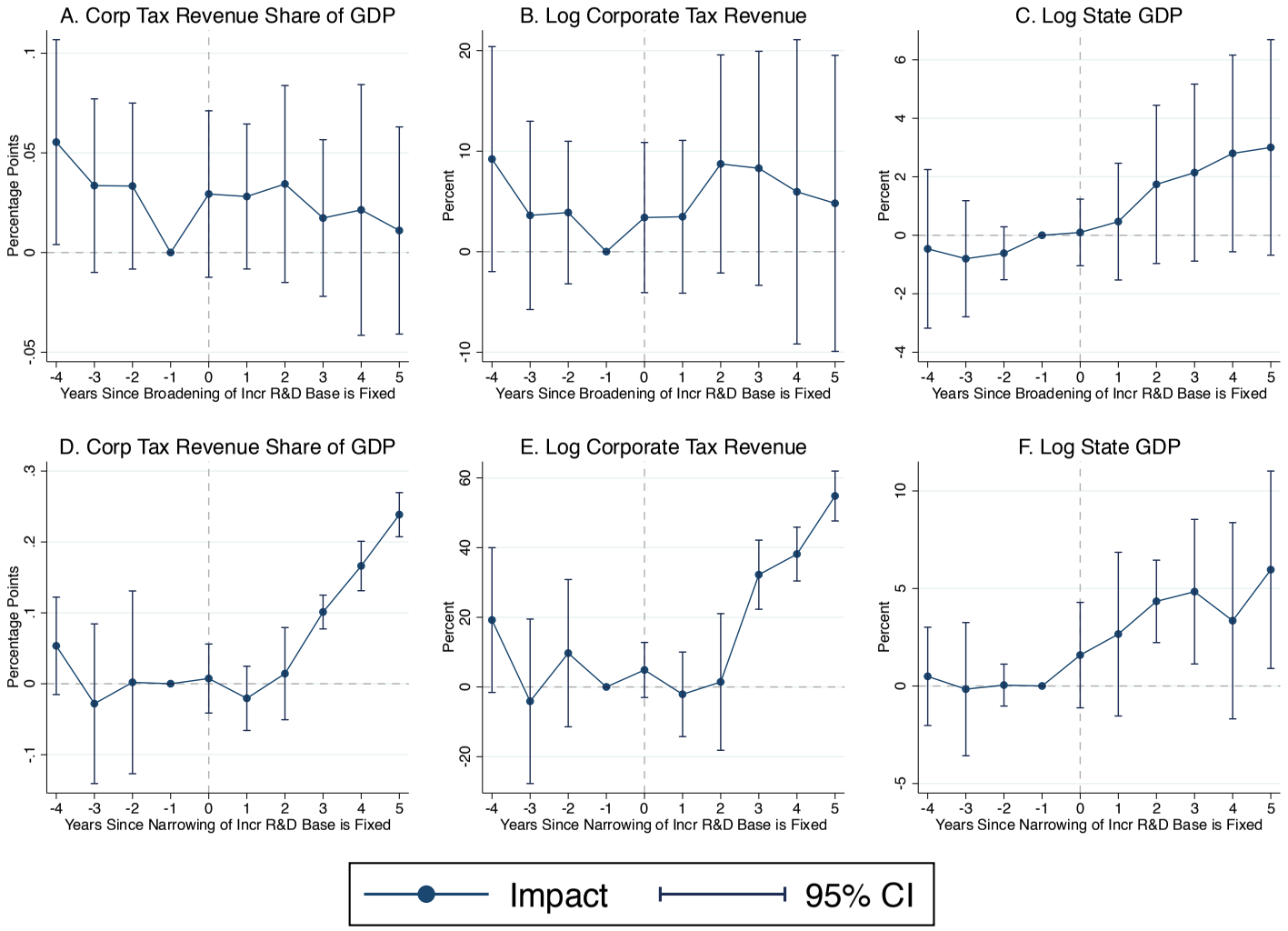
NOTES: This figure shows the effect of broadening and narrowing of throwback rules on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A43: Event Analysis: Impacts of Incremental R&D Base as Moving Average Changes on Revenue and GDP



NOTES: This figure shows the effect of broadening and narrowing of whether the incremental R&D base is a moving average on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A44: Event Analysis: Impacts of Fixed Incremental R&D Base Changes on Revenue and GDP



NOTES: This figure shows the effect of broadening and narrowing of whether the incremental R&D base is fixed on state corporate tax revenue as a share of state GDP, log corporate tax revenue and log state GDP, respectively. Standard errors are clustered by state. The construction of these event studies follows the form of equation 4. See Section 1 for details on data sources and Appendix A for detailed definitions of broadening and narrowing for each measure.

Figure A45: Corporate Tax Revenue Share by Region

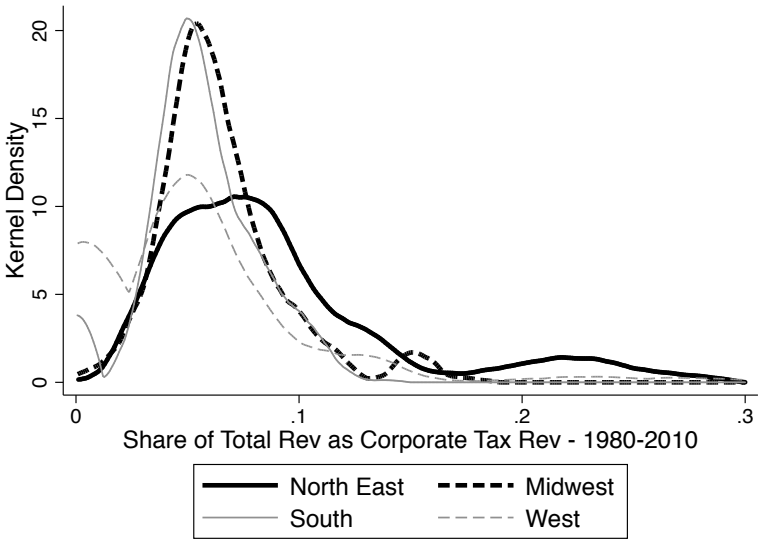
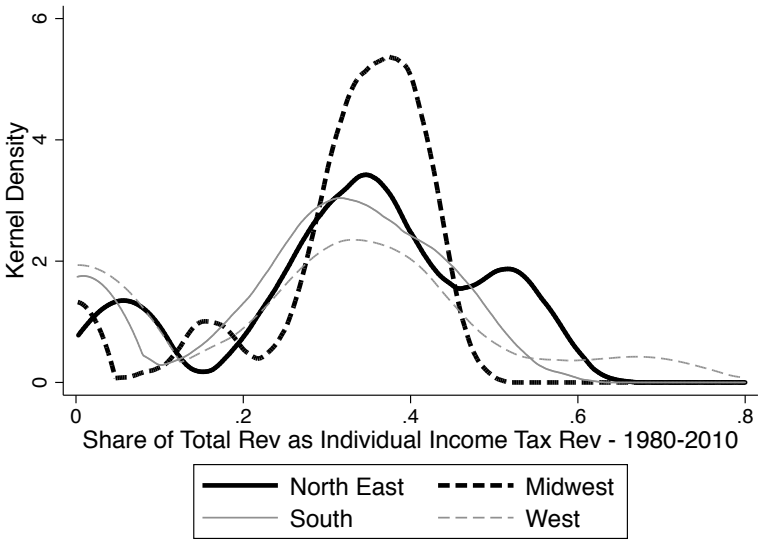
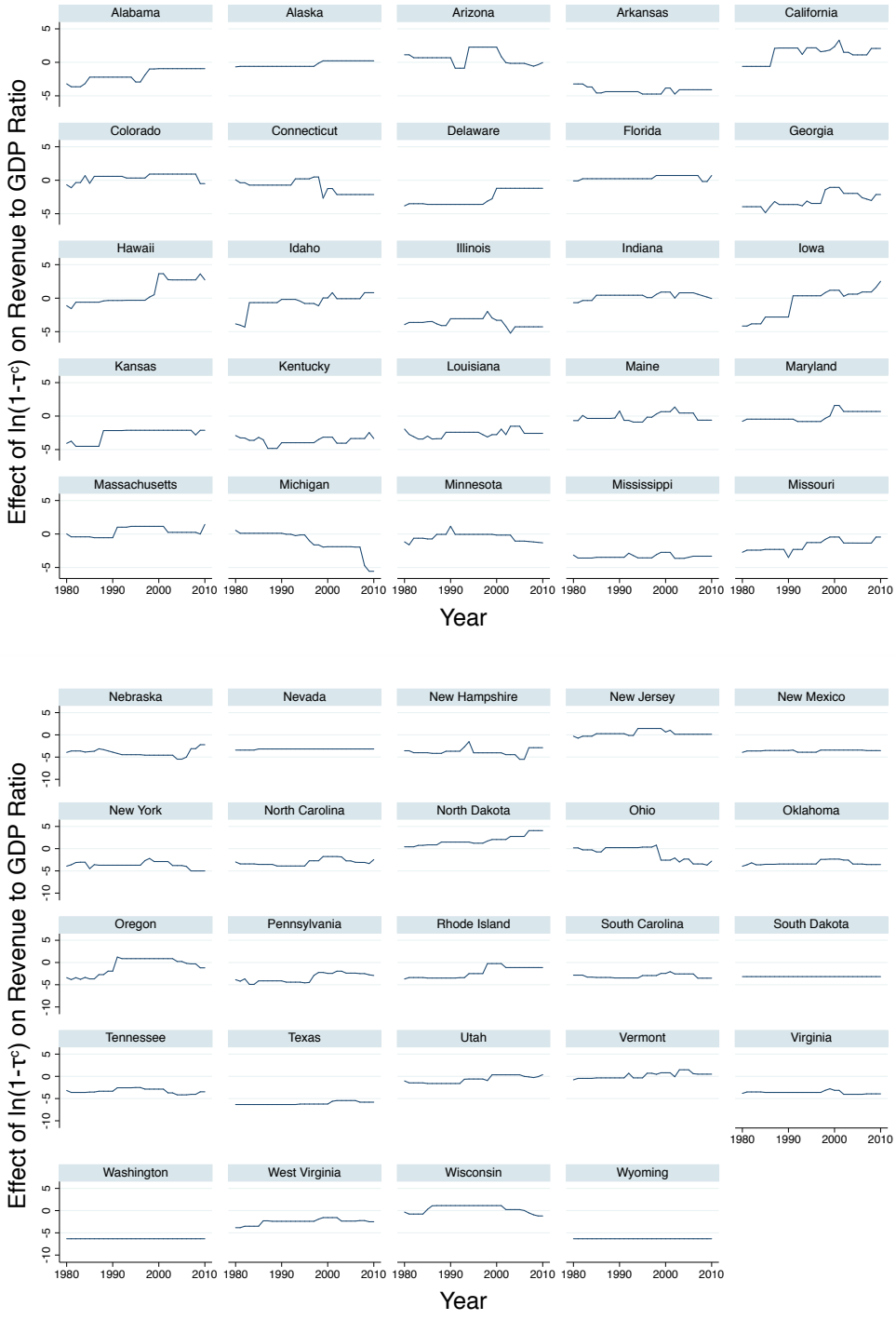


Figure A46: Individual Income Tax Revenue Share by Region



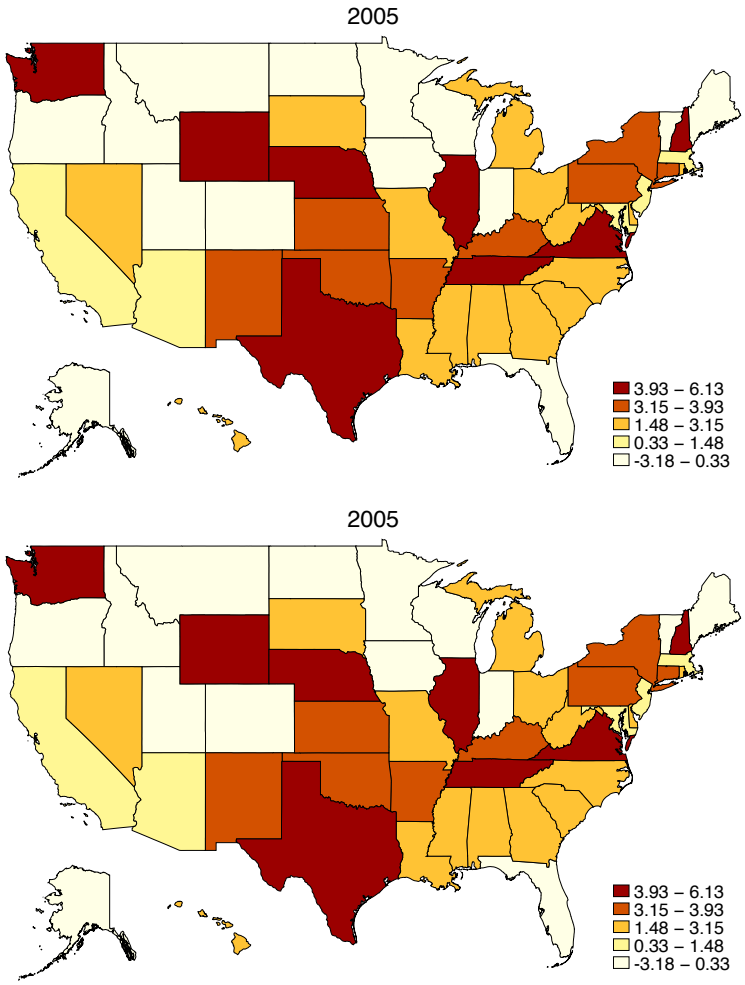
NOTES: Sample spans 1980-2010. Regions are based on standard U.S. Census regions. The District of Columbia is excluded from the density calculation. Note that the kernel density is equally weighted by state-year observation. That is, a single observation is one state-year (within a single region). The alternative would be to take the total single tax revenue for a given state over the sample period (1980-2010) and divide it by the total tax revenue for that state over the sample period. Both produce similar results. See Section 1 for details on data sources.

Figure A47: Estimated Total Effect of $\ln(1-\tau^c)$ on the Revenue-to-GDP Ratio By State-Year



NOTES: This figure plots estimated total effects of $\ln(1-\tau^c)$ on the revenue-to-GDP ratio for every state-year. The total effect is defined in equation 6 as a result of estimating equation 5, which is reported in Column (3) of Table 6. Data used for this estimation is discussed in Section 1, and details of the estimation can be found in Section 5. The coefficients on the terms $\ln(1-\tau^c)$ and interactions are multiplied by 100 to ease interpretation.

Figure A48: Maps of the Estimated Total Effect of τ^c on the Revenue-to-GDP Ratio



Notes: These maps plot total effects of τ^c on the revenue-to-GDP ratio for every state in 1985 and 2005. The category (color) ranges are held constant across time except for the maximum and minimum values. The total effect is defined in equation 6 as a result of estimating equation 5, which is reported in Column (3) of Table 6. Data used for this estimation is discussed in Section 1, and details of the estimation can be found in Section 5. The revenue-to-GDP ratio is measured in basis points. Overall, these maps show a decrease in the absolute value of the total effect of τ^c on the revenue-to-GDP ratio, while showcasing considerable heterogeneity across states.

Table A1: Bartik Tax Base Summary Statistics

Panel A. 1980-2010 Pooled Sample

	Observations	Mean	Std. Dev.
Property Tax Rate	672	2.545	0.939
Property Tax Abatement	672	0.353	0.529
Job Creation Tax Credit	672	0.300	0.514

Panel B. 2010 Cross Section

	Observations	Mean	Std. Dev.
Property Tax Rate	32	2.223	0.787
Property Tax Abatement	32	0.411	0.590
Job Creation Tax Credit	32	0.572	0.674

NOTES: This table provides summary statistics for the measures from Bartik (2017). Panel A provides pooled summary statistics. Data on property tax rates, property tax abatement and job creation tax credits range from 1990 to 2015. Panel B summarizes the tax base measures for the 2010 cross-section. Data on property tax rates, property tax abatement and job creation tax credits are from the Bartik (2017) dataset, which is restricted to 46 cities in 32 states that make up roughly 90 percent of aggregate U.S. GDP. Details on each of the variables, sources, and coverage are available in Appendix A.

Table A2: Variance Decomposition - Corporate Tax Revenue Share of GDP - Bartik and Unweighted

	Corp Rev Share of GDP		
% Variance Explained	66.06	27.53	51.04
Corporate Rate % of Explained Variance	0.31	71.29	3.82
Base Measures % of Explained Variance	99.69	28.71	96.18
% Base Variation Explained by Base Rule			
Federal Inc as State Base	71.96	2.72	61.05
Federal Inc Deductible	1.63	24.55	3.65
Throwback Rules	2.20	8.02	1.98
Sales Apportionment Wgt	1.16	8.52	6.78
Loss Carryforward	6.67	1.34	7.05
Loss Carryback	0.08	0.56	0.03
Combined Reporting	0.06	6.15	0.30
Investment Tax Credit	0.07	13.77	0.40
R&D Credit	0.11	2.04	0.65
ACRS Depreciation	0.53	7.96	0.31
Federal Accelerated Dep	0.69	0.03	1.83
Federal Bonus Dep	0.40	0.37	0.02
Franchise Tax	4.08	5.91	6.35
Incremental R&D, Moving Avg	0.53	7.56	1.15
Incremental R&D, Fixed	0.75	10.51	1.90
Property Tax	0.66		0.31
Property Tax Abatement	7.96		6.07
Job Creation Credit	0.45		0.16
Mean GDP Weighted	Yes	No	No

NOTES: This table shows the general explanatory power for the corporate tax rate, base rules, and additional bartik controls. The following tax base rules are included in all decompositions: loss carryforward, loss carryback, R&D credit, investment credit, throwback rule, combined reporting rule, federal income tax deductibility, federal bonus depreciation, federal income as state tax base, federal accelerated depreciation, ACRS depreciation, and the sales apportionment weight. In addition, we include the job creation tax credit rate, property tax rate, and property tax abatement as part of the "Bartik" controls where indicated. Decompositions are *not* weighted by state GDP where specified. Note that the variance decomposition shown in this figure is only performed on 33 states due to data limitations along the "Bartik" dimension. This table replicates Figure 5. See Section 1 for details on data sources.

Table A3: Frequency of tax base changes accompanying rate changes

Tax Rate Change:	Dec.	Dec.	Inc.	Inc.	None	None	Total	Total
Total Rate Changes:	76		237		1469		313	
Base narrowing/broadening:	-1	+1	-1	+1	-1	+1	-1	+1
Sales Apportionment Weight	4	2	2	1	86	30	92	33
Loss Carryback	0	3	1	0	22	39	23	42
Loss Carryforward	8	1	4	1	73	13	85	15
Francise Tax	1	0	1	1	1	2	3	3
Federal Income Tax Deductible	0	1	0	2	2	1	2	4
Federal Income Tax as State Tax Base	0	2	0	0	0	6	0	8
Federal Accelerated Depreciation	0	0	0	0	2	5	2	5
ACRS Depreciation	1	0	6	1	50	13	57	14
Federal Bonus Depreciation	1	1	1	2	16	40	18	43
Throwback	3	4	0	4	20	15	23	23
Combined Reporting	0	1	0	2	2	17	2	20
Investment Credit	1	1	0	0	33	8	34	9
R&D Credit	4	2	2	0	45	6	51	8
R&D Credit Incremental Base, Mov Avg	0	1	0	0	10	17	10	18
R&D Credit Incremental Base, Fixed	0	1	0	0	2	21	2	22

NOTES: This table reports the number of state-year observations where there was a change in tax base and tax rate. A change that represents a narrowing of the base is counted in the -1 column, while a year that represents a broadening of the base is counted as $+1$. The data used for this table are described in Section 1. See Appendix A for detailed definitions of broadening and narrowing for each measure.

Table A4: Sensitivity of Probit Estimates of the Coincidence of Base and Rate Changes

Panel A: Base Change

	Any Base Change	Base Broadening	Base Narrowing
Rate decrease	0.1157	0.0703	0.1304
	(0.2408)	(0.2769)	(0.3173)
No rate change	-0.0942	-0.2683	0.0981
	(0.1851)	(0.2349)	(0.2043)

Panel B: Tax Rate Change

	Any Tax Change	Tax Increase	Tax Decrease
Base narrowed	0.0231	-0.0558	0.0621
	(0.1467)	(0.1734)	(0.1993)
Base broadened	0.2611*	0.1835	0.2449
	(0.1466)	(0.2187)	(0.1563)

NOTES: This table describes the relationship between the timing of tax rate changes and the timing of tax base changes. Panel A reports coefficients from a probit model estimating the probability of a change in the tax base using changes in tax rates. Panel B reports coefficients from a probit model estimating the probability of a change in the tax rate using changes in the tax base. The data used for this table are described in Section 1. See Appendix A for definitions of broadening and narrowing for each measure. Year fixed effects are included in each panel. Standard errors are clustered by state ($^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$). Overall, this table shows that tax rate changes and tax base changes do not occur simultaneously.

Table A5: Probability of Rate and Base Changes Border and Similar State Changes in Past Year

Panel A. Neighboring States

	(1)	(2)	(3)	(4)	(5)
Dep Var	Baseline	Corp Rate Inc	Corp Rate Dec	Base Broadened	Base Narrowed
Corp Rate Increase	0.313	-0.077	-0.190	0.000***	
(N = 1476)		(0.183)	(0.429)	(0.362)	
Corp Rate Decrease	0.025	-0.018	0.000		
(N = 1458)		(0.383)	(0.290)		
Tax Base Broadening	0.008	0.000			
(N = 1326)		(0.399)			
Tax Base Narrowing					
(N = 1193)					

Panel B. Similar States

	(1)	(2)	(3)	(4)	(5)
Dep Var	Baseline	Corp Rate Inc	Corp Rate Dec	Base Broadened	Base Narrowed
Corp Rate Increase	0.058	-0.003		-0.023	0.000**
(N = 1186)		(0.405)		(0.254)	(0.167)
Corp Rate Decrease	0.055	0.043	0.012	0.043	0.022
(N = 1210)		(0.336)	(0.440)	(0.193)	(0.225)
Tax Base Broadening	0.271	-0.107	0.069**	-0.180***	0.069**
(N = 1210)		(0.329)	(0.296)	(0.243)	(0.101)
Tax Base Narrowing	0.224	-0.093	0.000	-0.080	-0.032
(N = 1210)		(0.274)	(0.337)	(0.195)	(0.110)

NOTES: This table describes how the probability of a rate or base change in a given state in year t ("event") is affected by changes in other states in $t-1$. Panel A calculates the impact of an increase or decrease in the corporate tax rate of at least 0.5pp, and/or the broadening or narrowing of the tax base in neighboring states. Panel B does the same for similar states. These estimates follow the form of equation 10. Column (1) indicates the probability of an event absent a rate of base change in comparison states. Column (2) calculates the change in probability of an event given a corporate rate increase of at least 0.5pp in a border or similar state. Columns (3)-(5) replicate Column (2) for a decrease of at least 0.5pp in the corporate rate, broadening of the tax base and narrowing of the tax base, respectively. Note 57 observations are excluded when calculating the probability of corporate tax rate decreases in neighboring states because the absence of base narrowing changes in the previous 5 years perfectly predicts that corporate rates will not decrease. Standard errors are clustered by state ($^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$). Section B describes the construction of neighbor and similar state matches.

Table A6: Probability of Rate and Base Changes Given Border and Similar State Changes in Past 5 Years

Panel A. Neighboring States

	(1)	(2)	(3)	(4)	(5)
Dep Var	Baseline	Corp Rate Inc	Corp Rate Dec	Base Broadened	Base Narrowed
Corp Rate Increase	0.112	0.023	-0.019	0.023**	-0.086
(N = 1488)		(0.143)	(0.163)	(0.315)	(0.560)
Corp Rate Decrease	0.027	0.008	0.008		
(N = 1388)		(0.184)	(0.209)		
Tax Base Broadening	0.004	0.002	0.002		
(N = 1388)		(0.244)	(0.256)		
Tax Base Narrowing	0.004	0.000			
(N = 1018)		(0.375)			

Panel B. Similar States

	(1)	(2)	(3)	(4)	(5)
Dep Var	Baseline	Corp Rate Inc	Corp Rate Dec	Base Broadened	Base Narrowed
Corp Rate Increase	0.086	0.000	0.000	-0.043**	0.000
(N = 1210)		(0.204)	(0.258)	(0.164)	(0.153)
Corp Rate Decrease	0.072	0.000	0.000	0.000	-0.008
(N = 1210)		(0.226)	(0.315)	(0.146)	(0.177)
Tax Base Broadening	0.206	0.000	0.000	-0.048*	0.000
(N = 1210)		(0.164)	(0.194)	(0.096)	(0.091)
Tax Base Narrowing	0.219	-0.044	0.006	0.006	-0.043*
(N = 1210)		(0.129)	(0.239)	(0.094)	(0.090)

NOTES: This table describes how the probability of a rate or base change in a given state in year t ("event") is affected by changes in other states in years $t-1, t-2, t-3, t-4$ or $t-5$. Panel A calculates the impact of an increase or decrease in the corporate tax rate of at least 0.5pp, and/or the broadening or narrowing of the tax base in neighboring states. Panel B does the same for similar states. These estimates follow the form of equation 11. Column (1) indicates the probability of an event absent a rate of base change in comparison states. Column (2) calculates the change in probability of an event given a corporate rate increase of at least 0.5pp in a border or similar state. Columns (3)-(5) replicate Column (2) for a decrease of at least 0.5pp in the corporate rate, broadening of the tax base and narrowing of the tax base, respectively. Standard errors are clustered by state ($^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$). Section B describes the construction of neighbor and similar state matches.

Table A7: Variance Decomposition - Corporate Revenue Share of GDP, Level and Log

	Corp Rev Share of GDP						Log Corp Rev Share of GDP					
% Variance Explained	48.57	83.88	85.50	57.23	84.97	86.70	40.35	78.13	82.29	46.40	79.76	83.82
Corporate Rate % of Explained Variance	43.78	19.54	32.08	0.85	0.97	1.23	24.33	12.76	30.10	2.47	0.21	0.86
Base Measures % of Explained Variance	56.22	80.46	67.92	49.63	61.82	61.83	75.67	87.24	69.90	50.54	51.29	51.66
% Base Variation Explained by Base Rule												
Federal Inc as State Base	18.02	1.67	2.41	18.63	1.04	1.69	0.01	0.10	0.05	6.77	1.63	2.02
Federal Inc Deductible	16.36	7.92	12.17	0.00	1.12	0.00	35.88	3.79	8.36	0.25	7.37	3.85
Throwback Rules	8.77	1.24	1.14	0.04	0.25	0.08	7.00	1.28	0.99	0.02	0.01	0.04
Sales Apportionment Wgt	20.01	7.49	6.65	2.01	3.26	2.65	2.70	0.96	0.22	0.70	0.01	0.00
Loss Carryforward	5.05	0.68	0.12	3.63	9.02	11.91	24.87	3.46	0.08	3.31	0.75	2.76
Loss Carryback	0.29	0.18	0.54	7.46	5.63	4.73	0.13	0.02	0.10	4.86	0.28	0.22
Combined Reporting	2.47	2.12	0.22	2.13	0.58	0.58	0.01	6.37	0.60	4.15	2.20	1.47
Investment Tax Credit	0.92	5.38	7.09	0.55	0.00	0.03	1.13	4.93	6.65	0.49	0.04	0.03
R&D Credit	1.35	3.09	4.12	31.02	3.26	1.16	0.27	0.03	0.06	43.07	26.29	22.01
ACRS Depreciation	3.83	1.49	0.17	0.18	3.42	0.70	10.96	1.19	0.16	0.26	3.77	2.05
Federal Accelerated Dep	0.04	12.72	10.98	0.23	5.93	2.49	6.58	3.26	2.03	0.45	0.71	0.15
Federal Bonus Dep	0.26	0.71	0.66	0.04	2.24	2.41	0.13	0.00	0.43	0.44	2.25	2.80
Franchise Tax	20.64	52.62	51.14	4.18	57.01	66.13	4.72	73.88	79.72	1.94	22.59	33.11
Incremental R&D, Moving Avg	1.19	1.94	1.33	17.43	1.61	0.40	2.27	0.27	0.00	20.03	5.70	3.51
Incremental R&D, Fixed	0.80	0.76	1.26	12.47	5.64	5.04	3.35	0.45	0.54	13.24	26.40	25.97
State Fixed Effects	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year Fixed Effects	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Base Measures × Corporate Rate	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes

NOTES: This table decomposes the variation of corporate revenue share of GDP and its logged counterpart. State fixed effects are included where indicated. Five-year-period fixed effects are included in all specifications where year fixed effects are not included. See Section 1 for details on data sources.

Table A8: Correlation Between Tax Base Measures and Change in Corporate Keep Rate

Panel A. Level of Tax Base Rules

	$d(1-\tau^c)$	ACRSDep	FedAccDep	FedIncTxDed	FedBonusDep	FedIncTxBase	FranchiseTx	LossCarryback	LossCarryfwd	Combined	ITC	R&D	R&D MA	R&D Fixed	PayAppWgt	Throwback
$d(1-\tau^c)$	1.000															
ACRSDep	-0.026	1.000														
FedAccDep	-0.006	0.736	1.000													
FedIncTxDed	0.005	0.126	0.143	1.000												
FedBonusDepr	-0.010	0.386	0.504	0.080	1.000											
FedIncTxBase	-0.010	0.533	0.528	0.019	0.425	1.000										
FranchiseTx	-0.014	0.032	-0.057	0.070	-0.101	-0.123	1.000									
LossCarryback	-0.067	0.290	0.346	0.192	0.350	0.251	0.002	1.000								
LossCarryfwd	-0.006	0.525	0.513	0.148	0.172	0.556	-0.045	0.432	1.000							
CombinedRep	0.049	0.127	0.183	-0.104	0.120	0.176	-0.285	-0.013	0.071	1.000						
ITC	0.032	0.147	0.157	-0.021	-0.098	0.122	0.172	-0.057	0.078	0.050	1.000					
R&DCredit	0.029	0.119	0.090	-0.001	-0.136	0.254	-0.144	-0.078	0.173	0.233	0.238	1.000				
R&D Base is MA	0.012	0.122	0.053	0.061	-0.023	0.117	0.063	0.026	0.200	0.163	-0.070	0.336	1.000			
Fixed R&D Base	0.030	0.073	0.097	0.077	-0.079	0.200	-0.283	-0.110	0.088	0.211	0.148	0.596	-0.172	1.000		
SalesAppWgt	-0.000	-0.502	-0.594	-0.026	-0.527	-0.395	0.011	-0.328	-0.311	-0.025	0.068	0.026	-0.005	0.132	1.000	
ThrowbackRules	-0.031	0.228	0.264	0.045	0.143	0.070	-0.142	0.126	0.115	0.389	-0.004	0.075	0.121	0.057	-0.337	1.000

Panel B. Change in Tax Base Rules

	$1-\tau^c$	ACRSDep	FedAccDep	FedIncTxDed	FedBonusDep	FedIncTxBase	FranchiseTx	LossCarryback	LossCarryfwd	Combined	ITC	R&D	R&D MA	R&D Fixed	PayAppWgt	Throwback
$1-\tau^c$	1.000															
ACRSDep	-0.082	1.000														
FedAccDep	-0.001	0.185	1.000													
FedIncTxDed	0.033	0.003	-0.001	1.000												
FedBonusDepr	-0.010	0.073	0.240	-0.002	1.000											
FedIncTxBase	0.079	0.033	0.002	0.002	-0.039	1.000										
FranchiseTx	-0.026	0.049	0.000	0.000	0.052	0.000	1.000									
LossCarryback	-0.054	0.024	-0.002	-0.001	-0.005	-0.062	0.000	1.000								
LossCarryfwd	0.041	0.232	0.055	0.003	-0.011	0.074	-0.027	0.110	1.000							
CombinedRep	-0.059	0.038	0.003	0.002	0.036	-0.007	0.087	-0.020	-0.022	1.000						
ITC	-0.001	-0.006	0.003	0.002	0.008	-0.007	0.000	0.079	0.037	-0.010	1.000					
R&DCredit	-0.043	0.007	0.004	-0.107	0.007	-0.031	0.010	-0.057	-0.001	-0.007	0.035	1.000				
R&D Base is MA	0.005	0.017	0.001	-0.076	0.003	-0.003	0.000	-0.056	0.019	-0.004	-0.009	0.382	1.000			
Fixed R&D Base	0.013	-0.014	0.003	0.086	0.009	-0.008	0.000	-0.057	-0.003	-0.011	0.062	0.449	-0.315	1.000		
SalesAppWgt	0.058	-0.014	0.005	-0.036	0.033	0.064	0.042	-0.071	-0.014	0.063	-0.017	-0.022	-0.007	-0.016	1.000	
ThrowbackRules	-0.093	0.018	0.000	0.000	0.019	0.000	0.060	-0.028	0.012	0.063	-0.000	0.004	0.000	0.000	0.053	1.000

NOTES: This table shows the correlation between tax base measures and changes in the corporate keep rate. Panel A and B calculate the correlation for levels of and changes in tax base rules, respectively. Corporate keep rate is denoted $1-\tau^c$. See Section 1 for details on data sources.

Table A9: Pass-through Share of State Economic Activity (2010)

	Pass-through Share of State		
State	Employment	Establishments	Payroll
Alabama	35.5	45.7	32.2
Alaska	35.8	45.8	32.0
Arizona	35.4	54.0	27.9
Arkansas	34.6	49.9	28.8
California	33.2	42.2	27.6
Colorado	38.3	61.0	31.7
Connecticut	29.7	39.6	27.3
Delaware	33.9	47.3	31.2
Florida	38.0	64.1	33.9
Georgia	33.9	54.9	28.5
Hawaii	26.7	37.3	23.0
Idaho	43.9	57.3	39.2
Illinois	35.6	51.3	31.0
Indiana	39.8	54.1	35.1
Iowa	33.0	43.5	28.8
Kansas	32.8	43.2	27.7
Kentucky	35.0	49.2	29.9
Louisiana	39.0	47.3	36.7
Maine	35.7	48.0	31.3
Maryland	34.6	48.8	31.3
Massachusetts	29.7	44.8	25.5
Michigan	35.1	45.9	30.1
Minnesota	35.1	54.2	28.4
Mississippi	32.6	42.7	28.3
Missouri	32.7	43.0	27.9
Montana	42.7	56.3	37.0
Nebraska	35.4	49.7	31.1
Nevada	37.7	54.0	34.4
New Hampshire	31.8	36.5	29.0
New Jersey	35.8	47.6	29.8
New Mexico	37.4	45.9	34.2
New York	34.4	47.9	31.9
North Carolina	34.5	50.3	28.5
North Dakota	36.0	45.0	31.4
Ohio	33.4	42.9	28.6
Oklahoma	37.0	50.3	32.4
Oregon	37.3	50.7	30.3
Pennsylvania	33.3	45.0	29.9
Rhode Island	37.8	54.4	32.7
South Carolina	35.5	48.1	30.3
South Dakota	39.3	49.2	36.3
Tennessee	29.1	35.3	26.2
Texas	33.7	43.1	28.9
Utah	40.4	65.3	33.8
Vermont	34.1	48.1	30.6
Virginia	34.0	48.8	30.1
Washington	35.6	50.8	28.5
West Virginia	29.2	35.3	25.0
Wisconsin	35.8	43.9	31.0
Wyoming	41.1	54.5	36.3

NOTES: This table describes the share of state-level economic activity attributed to pass-through corporations in 2010. Aggregate activity is the sum of employment, establishments and annual payroll across all business forms. The cross-section was drawn from County Business Patterns and includes all 50 states. See Section 1 for details on data sources.

Table A10: Heterogeneous Effects of Corp Tax Rates on R_s^{corp}/GDP_s: Robustness to Including Lagged Values

	(1)	(2)	(3)	(4)	(5)	(6)
τ^c	0.004	-0.001	0.010	0.002	0.001	-0.001
	(0.010)	(0.005)	(0.007)	(0.005)	(0.006)	(0.006)
L1 Lagged τ^c	0.014*	0.019**	0.018*	0.029**	0.022***	0.023**
	(0.008)	(0.008)	(0.010)	(0.012)	(0.007)	(0.009)
L2 Lagged τ^c				-0.008		-0.002
				(0.009)		(0.008)
L3 Lagged τ^c				0.002		-0.000
				(0.005)		(0.006)
L4 Lagged τ^c				-0.007		-0.001
				(0.006)		(0.008)
L5 Lagged τ^c				0.008		-0.001
				(0.006)		(0.007)
$\tau^c\times$ Joint Interactions From Table 4			0.013***	0.001		
			(0.003)	(0.003)		
L1 Lagged $\tau^c\times$ Lagged Joint Interactions From Table 4			0.001	0.007***		
			(0.001)	(0.002)		
L2 Lagged $\tau^c\times$ Lagged Joint Interactions From Table 4				0.000		
				(0.002)		
L3 Lagged $\tau^c\times$ Lagged Joint Interactions From Table 4				0.004		
				(0.002)		
L4 Lagged $\tau^c\times$ Lagged Joint Interactions From Table 4				0.002		
				(0.002)		
L5 Lagged $\tau^c\times$ Lagged Joint Interactions From Table 4				0.003		
				(0.002)		
Total Effect $\sum_t \beta_i^{\tau^c}$	0.019	0.019	0.028	0.025	0.023	0.019
	(0.011)	(0.009)	(0.006)	(0.013)	(0.011)	(0.012)
	0.083	0.031	0.000	0.052	0.026	0.110
Base and L1 Lagged Base Controls	N	Y	Y	Y	Y	Y
L2-L5 Lagged Base Controls	N	N	N	Y	N	Y
Base Interaction and Lagged Base Interaction	N	N	N	N	Y	Y
L2-L5 Lagged Base Interaction	N	N	N	N	N	Y
State Fixed Effects	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y

NOTES: This table reports the coefficients of regressions of the revenue-to-GDP ratio on the corporate tax rate τ^c. The models in this table expand those of Table 6 by including lagged values of τ^c, the tax base measures, and the joint interactions. Each specification includes state and year fixed effects and we report the total effect $\sum_t \beta_t^{\tau}$ in the table, along with standard error and p-value. Columns (1) and (2) show that including lagged values of τ^c and the base measures does not impact the total effect. By comparison, Table 6, Column (2), reports a value of 0.016, while this table reports 0.019. Columns (3) and (4) include lagged values of the the joint interaction term from Table 6. This table finds a total effect of 0.028, compared to the effect reported in Table 6 of 0.024. Columns (5) and (6) include interactions between lagged values of the tax rate and each of the controls and also find quantitatively similar effects to those in Table 6. The data used for this table are described in Section 1. Standard errors are clustered by state ($^*p < .1$, $^{**}p < .05$, $^{***}p < .01$).

Table A11: Variance Decomposition - Corporate Revenue Share of GDP - Including Top Income Tax Rate

	Corp Tax Rev Share of GDP	
% Explained	47.02	47.06
Corporate Rate	42.35	40.22
Base Measures	57.65	59.47
Top Personal Rate		0.31
% Explained Var Among Base Rules		
Federal Inc as State Base	15.24	16.33
Federal Inc Deductible	14.25	13.62
Throwback Rules	8.12	8.04
Payroll Apportionment Wgt	18.55	17.64
Loss Carryforward	9.74	10.50
Loss Carryback	0.01	0.00
Combined Reporting	2.73	2.27
Investment Tax Credit	0.20	0.12
R&D Credit	1.77	1.84
ACRS Depreciation	4.89	4.22
Federal Accelerated Dep	0.29	0.17
Federal Bonus Dep	0.81	0.96
Franchise Tax	19.63	20.04
Incremental R&D, Moving Avg	0.66	0.76
Incremental R&D, Fixed	3.10	3.51

NOTES: This table replicates the baseline specification in Table A7, but includes the top statutory personal income tax rate as an additional control. See Section 1 for details on data sources.

Table A12: Summary of State Characteristics Used in Constructing Similarity Scores

					Share of GDP							
	Log Pop		Skill Share		Agric		Constr&Mine		Manuf		Services	
State	1980	2010	1980	2010	1980	2010	1980	2010	1980	2010	1980	2010
Alabama	15.2	15.4	10.2	19.7	1.9	1.3	1.9	1.3	24.4	15.8	14.8	27.1
Alaska	12.9	13.5	19.9	23.7	1.8	1.0	1.8	1.0	3.7	2.1	8.6	17.6
Arizona	14.8	15.7	16.6	27.3	3.0	0.7	3.0	0.7	13.7	8.6	20.0	34.7
Arkansas	14.6	14.9	11.1	16.8	4.9	2.5	4.9	2.5	24.2	14.6	16.3	27.5
California	17.0	17.4	19.2	29.8	2.9	1.6	2.9	1.6	17.5	11.3	23.8	41.3
Colorado	14.9	15.4	24.8	37.7	2.7	0.9	2.7	0.9	13.4	7.8	21.2	40.4
Connecticut	15.0	15.1	19.6	36.1	0.6	0.1	0.6	0.1	28.3	12.0	25.7	46.0
Delaware	13.3	13.7	16.1	26.3	0.8	0.7	0.8	0.7	33.6	7.5	19.5	55.5
Florida	16.1	16.7	12.9	27.2	3.1	1.0	3.1	1.0	11.0	5.0	22.5	37.9
Georgia	15.5	16.1	15.5	27.4	1.5	0.9	1.5	0.9	21.9	11.1	17.4	37.9
Hawaii	13.8	14.1	18.0	26.6	3.2	0.6	3.2	0.6	5.1	1.9	23.4	35.0
Idaho	13.8	14.3	13.9	23.9	9.8	5.5	9.8	5.5	16.2	11.4	19.6	30.0
Illinois	16.3	16.4	14.9	30.0	2.0	0.8	2.0	0.8	24.9	13.0	22.1	38.9
Indiana	15.5	15.7	9.8	20.8	3.0	1.3	3.0	1.3	32.5	29.6	17.7	24.4
Iowa	14.9	14.9	13.5	23.1	9.9	5.2	9.9	5.2	24.8	18.9	19.9	29.6
Kansas	14.7	14.9	15.1	29.2	4.7	3.9	4.7	3.9	18.5	15.3	17.8	28.7
Kentucky	15.1	15.3	8.4	21.0	3.7	1.1	3.7	1.1	26.0	17.2	15.6	25.2
Louisiana	15.3	15.3	11.8	22.8	1.2	0.8	1.2	0.8	13.4	22.7	11.3	22.6
Maine	13.9	14.1	12.5	27.0	2.8	1.6	2.8	1.6	24.2	10.7	17.7	31.5
Maryland	15.3	15.6	18.5	35.2	0.9	0.3	0.9	0.3	14.1	6.3	24.6	40.1
Massachusetts	15.6	15.7	17.3	37.1	0.7	0.3	0.7	0.3	24.7	10.8	27.3	44.0
Michigan	16.0	16.1	13.7	25.7	1.5	0.8	1.5	0.8	30.1	17.6	19.2	32.2
Minnesota	15.2	15.5	14.5	29.9	5.5	2.3	5.5	2.3	21.0	13.7	20.8	36.1
Mississippi	14.7	14.9	11.8	16.7	3.7	2.4	3.7	2.4	22.8	15.1	13.9	24.2
Missouri	15.4	15.6	14.8	20.6	2.9	1.4	2.9	1.4	22.6	12.6	17.9	36.0
Montana	13.6	13.8	14.8	26.5	7.1	4.1	7.1	4.1	8.4	5.2	14.3	27.3
Nebraska	14.3	14.4	14.0	27.3	9.0	6.8	9.0	6.8	14.2	12.1	20.1	28.7
Nevada	13.6	14.8	13.4	21.1	1.3	0.2	1.3	0.2	5.1	4.1	17.3	31.9
New Hampshire	13.7	14.1	19.6	34.5	0.7	0.2	0.7	0.2	30.7	11.3	20.2	35.8
New Jersey	15.8	16.0	16.0	32.4	0.5	0.2	0.5	0.2	25.5	9.4	21.5	42.6
New Mexico	14.1	14.5	16.0	24.6	2.4	1.5	2.4	1.5	5.3	5.3	14.7	29.4
New York	16.7	16.8	15.5	31.5	0.7	0.2	0.7	0.2	18.4	5.9	30.7	50.4
North Carolina	15.6	16.1	15.7	25.5	2.6	1.1	2.6	1.1	32.7	21.1	14.5	31.5
North Dakota	13.4	13.4	13.7	26.6	6.9	8.8	6.9	8.8	5.1	7.1	14.5	23.1
Ohio	16.2	16.3	12.0	20.9	1.6	0.7	1.6	0.7	32.6	16.4	16.4	34.5
Oklahoma	14.9	15.1	13.2	23.1	2.9	1.6	2.9	1.6	14.5	9.5	14.6	24.5
Oregon	14.8	15.2	17.0	27.5	3.8	1.7	3.8	1.7	23.0	29.5	18.6	27.8
Pennsylvania	16.3	16.4	13.2	24.8	1.1	0.5	1.1	0.5	28.2	12.3	19.1	37.3
Rhode Island	13.8	13.9	16.0	28.5	0.9	0.2	0.9	0.2	28.3	8.1	21.3	38.8
South Carolina	15.0	15.3	11.8	23.5	1.5	0.8	1.5	0.8	30.2	16.3	14.0	29.9
South Dakota	13.4	13.6	11.3	24.3	13.4	8.2	13.4	8.2	9.5	8.8	17.6	32.9
Tennessee	15.3	15.7	12.1	22.4	2.0	0.6	2.0	0.6	25.9	15.6	16.4	29.9
Texas	16.5	17.0	14.7	24.1	1.5	0.8	1.5	0.8	16.6	14.5	16.0	27.5
Utah	14.2	14.8	18.8	26.4	1.6	0.5	1.6	0.5	15.0	14.9	17.6	32.7
Vermont	13.1	13.3	16.9	32.0	4.0	1.3	4.0	1.3	26.9	11.4	18.3	31.0
Virginia	15.5	15.9	18.2	34.2	1.1	0.3	1.1	0.3	19.0	9.7	17.8	40.9
Washington	15.2	15.7	20.1	31.3	3.6	1.8	3.6	1.8	20.6	13.9	17.6	37.2
West Virginia	14.5	14.4	6.7	19.4	0.7	0.4	0.7	0.4	19.4	9.8	13.1	21.7
Wisconsin	15.4	15.6	13.8	26.5	5.3	1.6	5.3	1.6	31.0	18.9	17.9	32.0
Wyoming	13.1	13.2	16.6	21.8	2.6	1.3	2.6	1.3	4.1	4.7	8.5	16.0
United States			15.1	27.4	2.3	1.1	2.3	1.1	21.3	12.3	20.2	36.4

NOTES: This table summarizes log population, state skill share, agriculture share of GDP, construction and mining share of GDP, manufacturing share of GDP and services industries' share of GDP for all 50 states in the first and last years of the sample. The table also includes the national average. Skill share is the share of the population 18 or older with a Bachelor's Degree or above.

Table A13: States Considered "Similar" in the year before an event

State	Similar States
AK	NM, WY
AL	AR, KY, MS, TX, WV
AR	DE, ID, KY, ND, TN, WY
AZ	CA, GA, HI, IL, NM, OH, TX, WY
CO	AK, HI, IA, MA, ND, WY
CT	IN, MA, MI, WY
DE	NH
FL	AL, CA, HI, NE, TX
GA	CA, DE, NC, NJ, PA, SC, TN, TX, VA, WA
HI	NV, SD
IA	CA, CO, NC, ND, OR, WI, WY
ID	AR, CT, KY, NE, NY, SD, VT, WV, WY
IL	CA, MA, MI, NJ, NY, PA, TX
IN	AR
KS	CA, IA, IN, KY, UT, VT, WI
KY	AK, AR, IA, IN, LA, MS, NC, ND
LA	IN, KY, ND, OH, TX, WY
MA	NJ, NY, WI
MD	AK, CA, MA, NY, VA
ME	AR, HI, ID, MS, NH, NV, RI, SD, WV
MI	CT, DE, IL, IN, NH, NY, OH, WI
MN	CA, CO, CT, IN, NJ, WI, WY
MO	AL, CT, FL, GA, MI, NE, NV, NY, PA, WA
MS	AK, AR, HI, KY, SC, TN, TX, WY
MT	AK, HI, MD, ND, NV
NC	AR, CA, DE, IN, KS, NE, OH, WA, WI
ND	AK, IA, MT, NC, SD
NE	CA, HI, ID, MA, NY, SD, TN, WA
NH	CT, IN, MA, MD, RI, SC, VA, VT
NJ	MA, NY, WV
NM	AK, HI, MS, NE, NY, TX, WY
NV	HI
NY	NJ
OH	IN, NC, NJ, NV, NY, PA, SC, TN, VA
OK	AK, FL, LA, MS, NC, NM, TN, VA, WV
OR	CT, DE, HI, IN, NE, NH, TN, WI
PA	CA, FL, HI, IA, NV, NY, OH, TN, VA, WV
RI	NH, NV, TN
SC	NC, NM, OH, WV
TN	AL, AR, FL, ID, NE, OH, VA, WA
TX	AK, CA
UT	AK, DE, HI, LA, NH, NM, NV, SC, VA, WV
VA	AK, CA, CO, MA, MI, NJ, OH, SC
VT	DE, ID, KS, MT, ND, NH, SD
WI	CT, IA, MI, NC, OR, TN
WV	HI, IN, WY

NOTES: This table lists all states for whom there is a similar state match in the year before a corporate tax rate or a tax base change. See Section B.2 for a description of how similar states were defined.