State Corporate Income Tax Apportionment Policy: Lessons Learned

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Outline

- Lessons from the effects on real economic activity
  - Employment
  - Investment (Gupta & Hofmann, 2003)
- Lessons from the behavioral response of firms
  - Gupta & Mills, 2002
- Preliminary lessons from the effects on state corporate income tax revenues
  - Gramlich, Gupta & Hofmann, 2004

Effects on Employment

- E.g., Goolsbee & Maydew (2000)
  "Coveting thy neighbor's manufacturing: The dilemma of state income apportionment," *Journal of Public Economics* 75 (2000): 125-143.
  - Use panel data from 1978 to 1994 to examine the effect of double-weighting the sales factor
  - Results
    - Reducing the payroll factor weight from 1/3 to ¼ (i.e., double-weighting the sales factor) increases manufacturing employment in the state by 1.1%
    - However, there are important negative externalities
      - Increase in jobs in the change-state is offset by a loss of jobs in other states
      - Thus, aggregate effects are close to zero

Effects on Investment

- Several studies
  - **Carlton (1979, 1983)** – examined location decisions of firms; state corporate tax rate not significant
  - **Papke (1987, 1991)** – regressed new capital expenditures on three measures of tax burden; only the simulated after-tax return measure was significant
    - **Tannenwald (1996)** – reexamined Papke's result with newer data; tax effect was smaller and statistically insignificant
  - **Weiner (1996)** – found formula apportionment has no independent effect on capital-labor ratios and only marginally significant effects on capital spending when examining apportionment changes from 1982 to 1990

Gupta & Hofmann (2003)

"The Effect of State Income Tax Apportionment and Tax Incentives on New Capital Expenditures," *The Journal of the American Taxation Association* 25 (Supplement) 2003.

- Research questions
  - Do states with lower *income tax burden on property* experience a higher level of new capital spending by corporations?
    - BURDEN = (top statutory tax rate) * (property factor weight)
  - Do states with more *investment-related tax incentives* experience a higher level of new capital spending by corporations?
  - Do the above effects differ in states whose *tax base* is determined using "unitary taxation" or a "throwback rule"?

Gupta & Hofmann (2003)

Motivation

- The accelerating trend among states to change their apportionment formula to double-weighted sales or even 100% sales
- The proliferation of state tax incentives for business investment/employment
- The focus of prior research on one or two structural components of the state tax regime, with conflicting results.

Gupta & Hofmann (2003)
The Apportionment Formula

$$x_i = \left[\left(w_i^S * \frac{s_i}{S} \right) + \left(w_i^L * \frac{l_i}{L} \right) + \left(w_i^P * \frac{p_i}{P} \right) \right] * \pi * r_i$$

x_i	the firm's income tax liability in state *i*
π	the firm's nationwide (or worldwide) taxable income
r_i	the statutory tax rate in state *i*
s_i , l_i, p_i	the firm's sales, payroll, and property in state *i*
S, L, P	the firm's nationwide sales, payroll, and property
w_i^S, w_i^L, w_i^P	state *i*'s factor weights for sales, payroll, and property

(the factor weights must sum to one)

Gupta & Hofmann (2003)
Effects of Factor Apportionment

Distributing the rate and income terms, the apportionment formula transforms the state corporate income tax into separate taxes on sales, labor and property (McClure, 1980):

$$\left[\left(w_i^S r_i * \frac{s_i}{S} * \pi \right) + \left(w_i^L r_i * \frac{l_i}{L} * \pi \right) + \left(w_i^P r_i * \frac{p_i}{P} * \pi \right) \right]$$

When a firm acquires additional property in state *i*, holding all else constant, its income tax liability will increase in the following manner:

$$\Delta x_i = w_i^P * r_i * \Delta \frac{p_i}{P} * \pi \qquad (w_i^P * r_i = BURDEN)$$

Hyp.1: *Ceteris paribus*, new capital expenditures in a state are decreasing in its income tax *BURDEN* on property.

Gupta & Hofmann (2003)
Effects of Tax Incentives

- Investment-related incentives
  - Income tax credits for
    - investment expenditures
    - enterprise zone activities
    - job creation
    - research/development expenditures
  - Accelerated depreciation
  - Exemption of manufacturing facilities, equipment, supplies, and/or inventories from state sales and/or property taxes
- Hyp.2: *Ceteris paribus*, new capital expenditures in a state are increasing in investment-related tax incentives available in that state.

Gupta & Hofmann (2003)
Effects of Unitary Reporting Rules

- Firms in unitary states are
  - taxed on a broader income base
  - less able to use tax-planning to minimize state taxes
  - more responsive to tax rate changes
- Hyp.3: *Ceteris paribus,* new capital expenditures in unitary states are decreasing in the income tax *BURDEN* on property, and by a greater amount than in non-unitary states

Gupta & Hofmann (2003)
Effects of the Throwback Rule

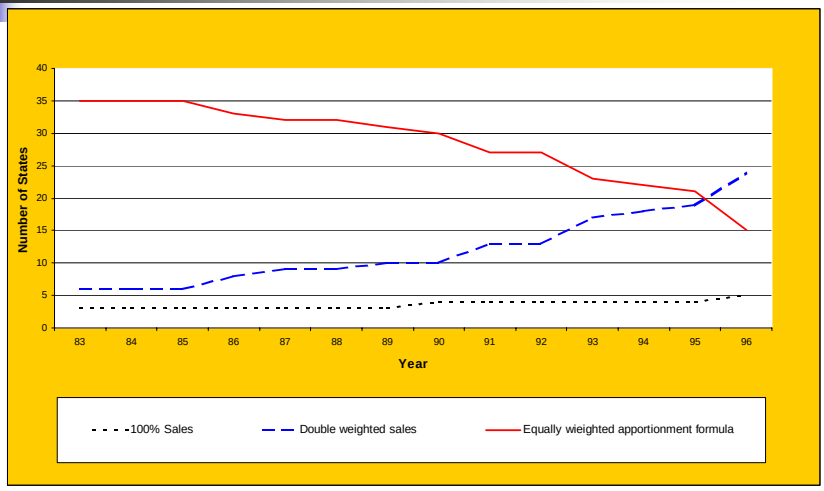
- Firms in throwback states are
  - taxed on a larger proportion of income
  - more sensitive to tax rate or apportionment formula differences
- Hyp.4*: Ceteris paribus,* new capital expenditures in states employing the throwback rule are decreasing in the income tax *BURDEN* on property, and by a greater amount than in states not employing this rule.

Gupta & Hofmann (2003):
Empirical Procedures

- Data
  - New capital expenditures in the manufacturing sector (most complete data available)
  - 44 states with a corporate income tax
    - Omitted NV, SD, WY – no corporate income tax
    - Omitted MI, WA, TX – tax base other than income
  - 14 years of data (1983-1996)
  - 44*14 = 616 state-year observations
- Methodology
  - Controls for size of the manufacturing sector, census region, energy costs, public expenditures, state fixed-effects
  - Sensitivity tests: all 50 states, separation of rate and factor weight, annual regressions, varying definition of unitary

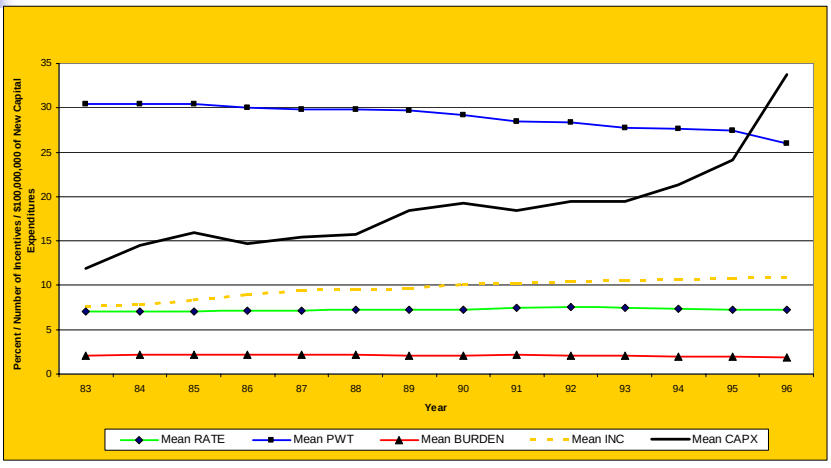
Trends in Sales Factor Weights in Apportionment Formulae, 1983-96

(Source: Gupta & Hofmann, 2003)



Trends in Tax Variables and New Capital Spending, 1983-96

(Source: Gupta & Hofmann, 2003)



Gupta & Hofmann (2003): Results

- See Table 3 of paper
- State corporate income tax policies do have a (statistically) significant influence on new capital spending in the state
  - New capital spending is declining in BURDEN, and increasing in investment-related tax incentives
- However, the estimated magnitude of these effects is VERY modest (economically insignificant)
  - 1% decline in BURDEN is associated with a $2-6 million increase in new capital spending
  - An additional investment-related incentive is associated with a $0.5-2.5 million increase in new capital spending

Gupta & Hofmann (2003): Conclusions

- Rates, apportionment factor weights, and investment-related incentives are more influential on new capital spending in unitary and/or throwback states
- Triangulating this study with prior research suggests the following hierarchy of the relative importance of state income tax regimes
  - Unitary/throwback definition of tax base
  - Tax rates/apportionment factor weights
  - Investment-related tax incentives

Firms' Responses to Disconformity in States' Apportionment Formulae

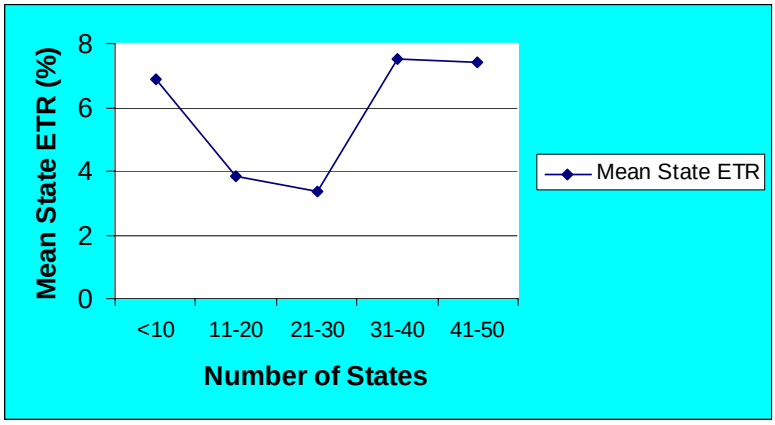
- Gupta & Mills (2002)
  "Corporate multistate tax planning: Benefits of multiple jurisdictions," *Journal of Accounting & Economics* 33 (February 2002): 117-139.
  - Investigate how firms use differences in state income tax regimes to lower their state tax burdens
  - Specifically, we examine relationship between firms' state effective tax rate and
    - Number of states in which they file returns, and
    - A proxy for firms' ability to shift income through sales factor apportionment
  - Develop a model that predicts that firms' state effective tax rates (SETR) first increase and then decrease as a function of the number of states in which they file

Gupta & Mills (2002)
Results

- Find evidence consistent with the model's predictions
  - State ETRs are minimized at about 24 states
  - Reduction in state ETRs is associated with greater use of sales factor apportionment, widely recognized as the most common form of state tax planning

Mean State Effective Tax Rates

(Source: Gupta & Mills, 2002)



Gupta & Mills (2002)

Implications

- Firms adopt reporting and corporate structures to reduce their state income tax burdens
- The reduction of state ETRs as a function of number of states implies that disconformity between states potentially causes state tax revenues to decline

Effects on State Corporate Income Tax Revenues

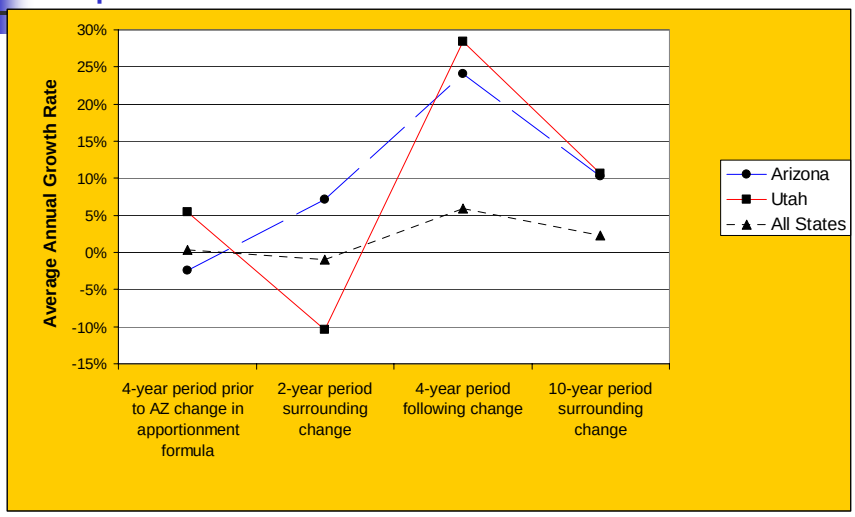
- Several studies; example
  - Fox & Luna (2002)
    "State corporate tax revenue trends: Causes and possible solutions," *National Tax Journal* 55 (September 2002): 491-508
    - Examines the extent to which state corporate income tax revenues have declined and possible causes
  - Edmiston (1999)
    "Optimal factor weights in state corporate income tax apportionment formulas," State Tax Notes 16 (June 1999).
    - Uses simulations and a non-cooperative game to determine the optimal apportionment structure from different perspectives – finds that in terms of revenue optimality depends on whether the state is a production state or a market state

New Analysis

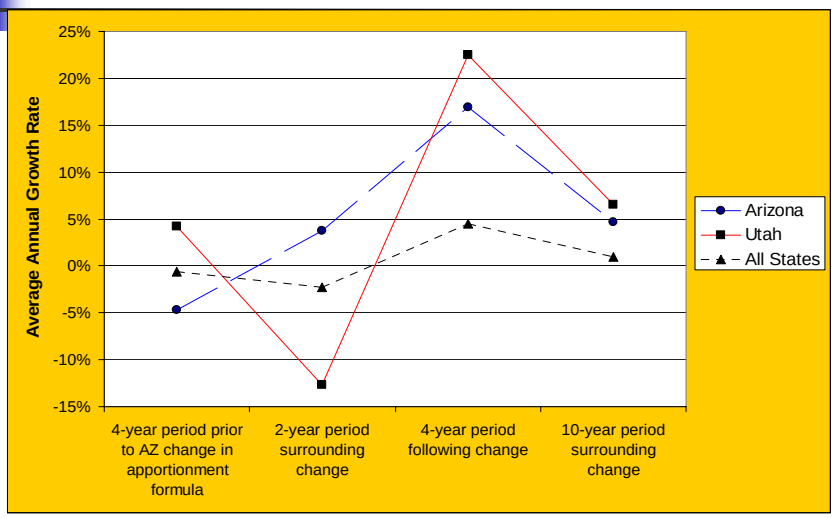
Gramlich, Gupta & Hofmann (2004)

- Analysis of certain states that changed apportionment factor weights with neighboring no-change states
- 4 pairs of change v. no-change states
  - Arizona v. Utah
  - Maine v. Vermont
  - Nebraska v. Kansas
  - Oregon v. Colorado
- AZ, ME, NE and OR changed the weight on their sales factor in 1990-91

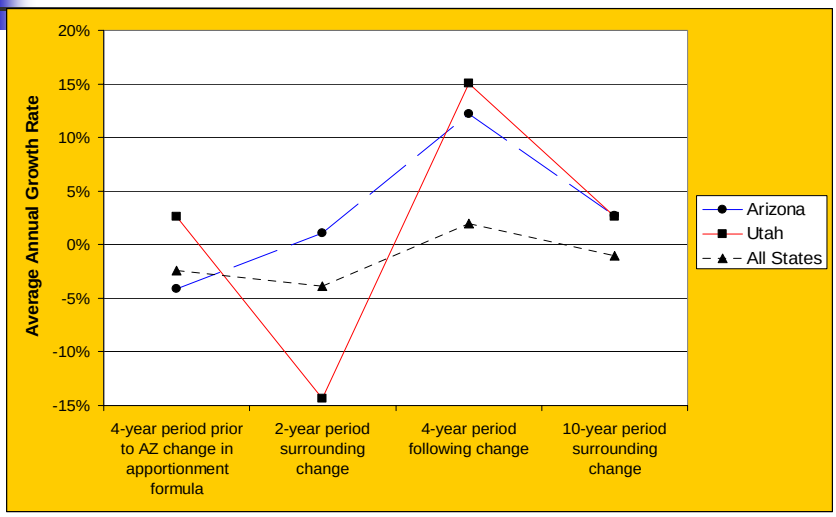
AZ v. UT: Average Annual Growth in State Corporate Income Tax Revenues



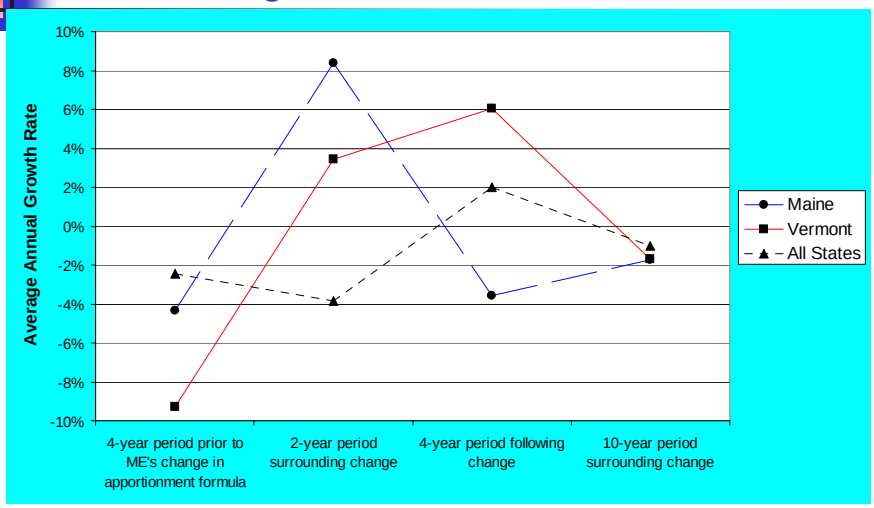
AZ v. UT: Average Annual Growth in Per-Capita State Corporate Income Tax Revenues



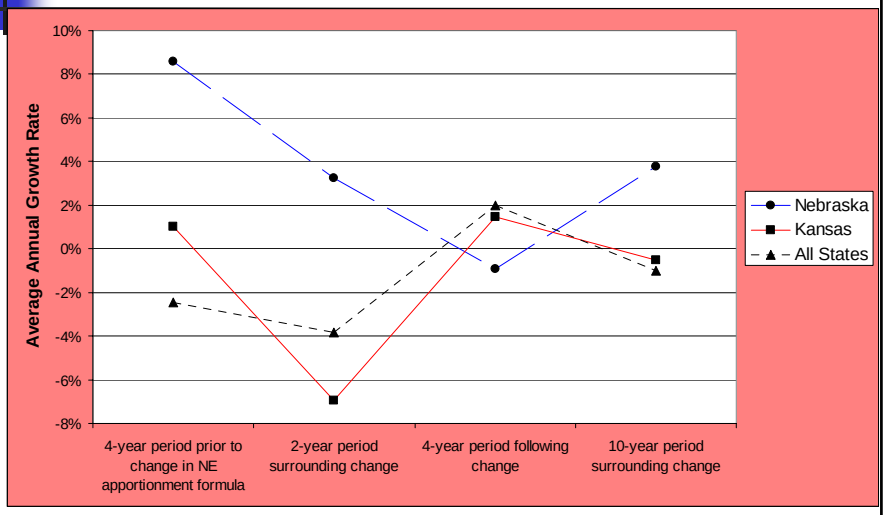
AZ v. UT: Average Annual Growth in State Corporate Income Tax Revenues as a Percentage of GSP



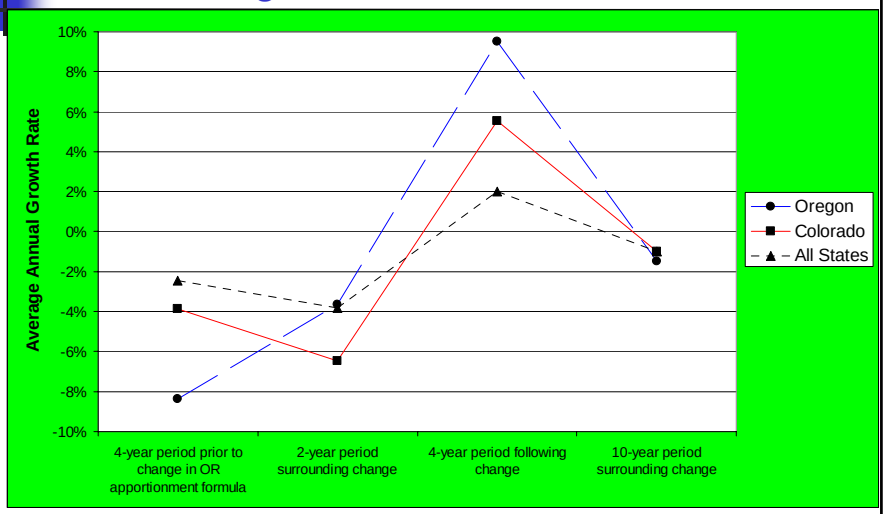
ME v. VT: Average Annual Growth in State Corporate Income Tax Revenues as a Percentage of GSP



NE v. KS: Average Annual Growth in State Corporate Income Tax Revenues as a Percentage of GSP



OR v. CO: Average Annual Growth in State Corporate Income Tax Revenues as a Percentage of GSP



Summary of Analysis

- Reasons for the change in apportionment factor weights appear to be defensive rather than proactive
  - Three of the 4 change states (AZ, VT, and OR) were experiencing negative revenue growth prior to change
- Change appears to be followed by a strong growth in CIT revenues
  - But, three of four NON-change states had stronger growth in CIT revenues in the 4-year period following change
  - And over a 10-year period surrounding the change, there appears to be virtually no difference in the CIT revenue growth between change and non-change states
- Change in state corporate income tax revenues is consistent across scaling for population, GSP, etc.
  - Signs are in the same direction; magnitudes are proportional
- Caveat: choice of non-change state

Closing Remarks

- Effects of formula apportionment changes
  - Likely to have small, if any, effects on real economic activity, especially new capital investment
  - Initially there will be winners and losers, but firms will plan around the new rules
  - Long-term revenue effects unlikely to be significantly different from not changing the formula
- Overall, piecemeal changes to state corporate income tax regimes probably not a good idea