

Appendix O: Findings of peer-reviewed research

Table O-1

Summary of empirical research on corporate tax apportionment policies, green job incentives, and manufacturing sales and use tax exemptions

Economic impact of corporate tax apportionment policies						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Klassen and Schackelford (1998)	U.S.	States	Manufacturing shipments to state	OLS regression of change from 1983 to 1991	U.S. Census Bureau, Bureau of Economic Analysis, ACIR, CCH*	Manufacturing sales are negatively associated with state sales factor rate for throwback states.
Lightner (1999)	U.S.	States	Percentage change in employment	OLS regression, 1994–95	Bureau of Economic Analysis, other	Apportionment formula is not significantly associated with employment growth.
Goolsbee and Maydew (2000)	U.S.	States	Manufacturing and non-manufacturing employment	Fixed effects regression, 1978–1994	Bureau of Economic Analysis, CCH, other*	Double-weighted sales weighting induces 1.1% change in state manufacturing employment and 0.7% nonmanufacturing employment. Effect is greater in capital intensive manufacturing (durable goods) than other manufacturing (nondurable goods) and nonmanufacturing.
Agostini and Tulayasathien (2003)	U.S.	States	Foreign direct investment	Pooled interval regression with IV for years 1980, 1987, 1992, and 1997	Bureau of Economic Analysis FDI by state and source country	Increasing weight of property factor decreases share of total FDI received by state.
Gupta and Hofmann (2003)	U.S.	States	Capital expenditures	Pooled and fixed effects regression, 1983–1996	U.S. Census Bureau, ACIR, CCH, Site Selection Magazine, Energy Information Administration*	Pooled results indicate that lower property factor weight has positive effect on capital investment but effect is small. Fixed effects regression indicates that property tax burden effect is present only for states that have unitary taxation or throwback rule which exacerbates burden effect.

Appendix L: Findings of peer-reviewed research

Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Edmiston and Arze del Granado (2006)	Georgia	Firms	Local sales, payroll, and property	Fixed effects regression, 1992–2002	Georgia Department of Revenue	Adoption of double-sales weighting has positive effect on payroll and property and large negative effect on sales. Net revenue effect is substantially negative.
Gupta, et al (2009)	U.S.	States	State tax revenues	Fixed effects, two-stage least squares	U.S. Census Bureau, Bureau of Economic Analysis, CCH, Other*	States adopting double-weighted sales factor have 16%–18% lower corporate tax income revenues.
Bernthal et al. (2012)	U.S.	States	Manufacturing employment	Fixed effects regression, 1978–2010	Bureau of Economic Analysis, CCH, other*	Small but statistically significant relationship between sales apportionment weight and manufacturing. Effect is much smaller (4 times) than Goolsbee and Maydew (2000).
Merriman (2014)	U.S.	States	Manufacturing employment	Fixed effects regression, 1978–1994 and 1978–2010	Bureau of Economic Analysis, CCH, other*	Study shows that Goolsbee and Maydew (2000) results are not robust to sample changes and econometric estimation improvements. Double-weighting sales does not have significant effect on manufacturing employment.
Moore and Bruce (2014)	U.S.	States	Personal income, gross state production, non-farm employment	Fixed effects regression with policy interaction effects, 1996–2010	Bureau of Economic Analysis, CCH, other*	Higher sales factor weight is associated with higher personal income, GSP, and employment. Higher corporate tax rates decrease the effects.
Swenson (2015)	Five U.S. States that switched to SSF (Georgia, Louisiana, New York, Oregon, Wisconsin)	Firms	Employment and sales	Difference-in-difference regression	National Establishment Time Series (NETS) 1990–2009	Single sales factor apportionment is associated with expanding operations of locally based firms with interstate operations but effect is small.
Clausing (2016)	U.S.	States	Employment, capital expenditures, sales, and corporate tax revenue	Fixed effects regression	U.S. Census Bureau, Bureau of Economic Analysis, Other	Employment and investment are not sensitive to factor (payroll and asset) burden. Higher sales burden associated with reduced corporate tax revenue.

Economic impact of green job incentives						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Li (2013)	U.S.	Metropolitan statistical areas	Number of green jobs	Two stage probit least squares, 2006	Global Insight, DSIRE, EPA, Other*	Index of state and local clean energy and climate policy tools (including regulations and financial incentives) has a moderate, positive association with number of green jobs.
Lee (2017)	U.S.	State	Number of private sector green jobs per 1,000 population and percentage of all jobs that are green jobs	Panel fixed effects with IV, 1998–2007	Pew Charitable Trusts, DSIRE*	State renewable energy and energy efficiency regulations are associated with modest increase in green jobs, while green incentives have a slight negative association with jobs.

Economic impact of manufacturing sales and use tax exemptions						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Hageman, Bobek, and Luna (2015)	U.S.	States	Manufacturing capital expenditures, manufacturing employment	Fixed effects regression with IV, 1983–2006	U.S. Census Bureau, Bureau of Economic Analysis CCH, Other*	Sales and use tax burden for manufacturing equipment and materials is negatively associated with manufacturing capital expenditures and employment. Magnitude of effect, however, is small.
Mikesell and Ross (2017)	Contiguous U.S. states	State border counties	Manufacturing wages and employment	Cross border panel data, quarterly 2001–2011	Bureau of Labor Statistics, CCH*	Sales and use tax burden is not associated with manufacturing employment or wages.

SOURCE: Weldon Cooper Center.

*Advisory Commission on Intergovernmental Relations (ACIR), Commerce Clearing House (CCH), DSIRE (Database of State Incentives for Renewable Energy).