

Taxes and the Location of U.S. Business Activity Abroad

John Mutti*
Grinnell College

Eric Ohrn†
Grinnell College

June 2018

Abstract

Using panel data describing the activities of U.S. multinational enterprises abroad from the BEA, we extend classic models in the international tax literature ([Grubert and Mutti \(1991\)](#), [Hines Jr and Rice \(1994\)](#), [Altshuler et al. \(2000\)](#)) to a panel-fixed effects econometric setting. We present four key findings. (1) Even in the presence of country and year fixed effects, effective corporate tax rates have substantial effects on the location of U.S. business activity abroad, (2) The responsiveness of business activity has remained stable over the past 28 years, (3) Elasticities are stable or larger when we instrument for or lag effective tax rates suggesting mechanical endogeneity is not responsible for the estimates, and (4) The estimated elasticities of U.S. business activity are robust across model specification. We conclude that classic estimates in the international tax literature stand the test of time and continue to be the benchmark for future international tax research.

Keywords : international taxation, investment

JEL Classification : F2; H2

*mutti@grinnell.edu

†ohrneric@grinnell.edu

1 Extended Abstract

Classic papers in the international tax literature, such as [Grubert and Mutti \(1991\)](#), [Hines Jr and Rice \(1994\)](#), and [Altshuler et al. \(2000\)](#) show that effective tax rates have substantial effects on the location of U.S. multinational enterprise business activity abroad. In this paper, we use panel data and panel-fixed effects econometric specifications to explore the durability of the estimates presented in these classic works.

We present four main results. First, as shown in [Table 1](#) and [Figure 1](#), even in the presence of country- and year- fixed effects, effective tax rates continue to have a substantial impact on the location of U.S. business activity abroad. Second, as shown in [Figure 2](#), the responsiveness of U.S. business activity to effective tax rates has remained stable over the past 28 years. Third, as shown in [Table 2](#) and [Table 3](#), our key estimates are stable when we instrument for effective tax rates or lag effective tax rates suggesting mechanical endogeneity is not inflating the estimated elasticities. Fourth and finally, as shown in [Table 4](#), the estimated responsiveness of U.S. business activity abroad to effective tax rates is robust to alternative effective tax rate specifications.

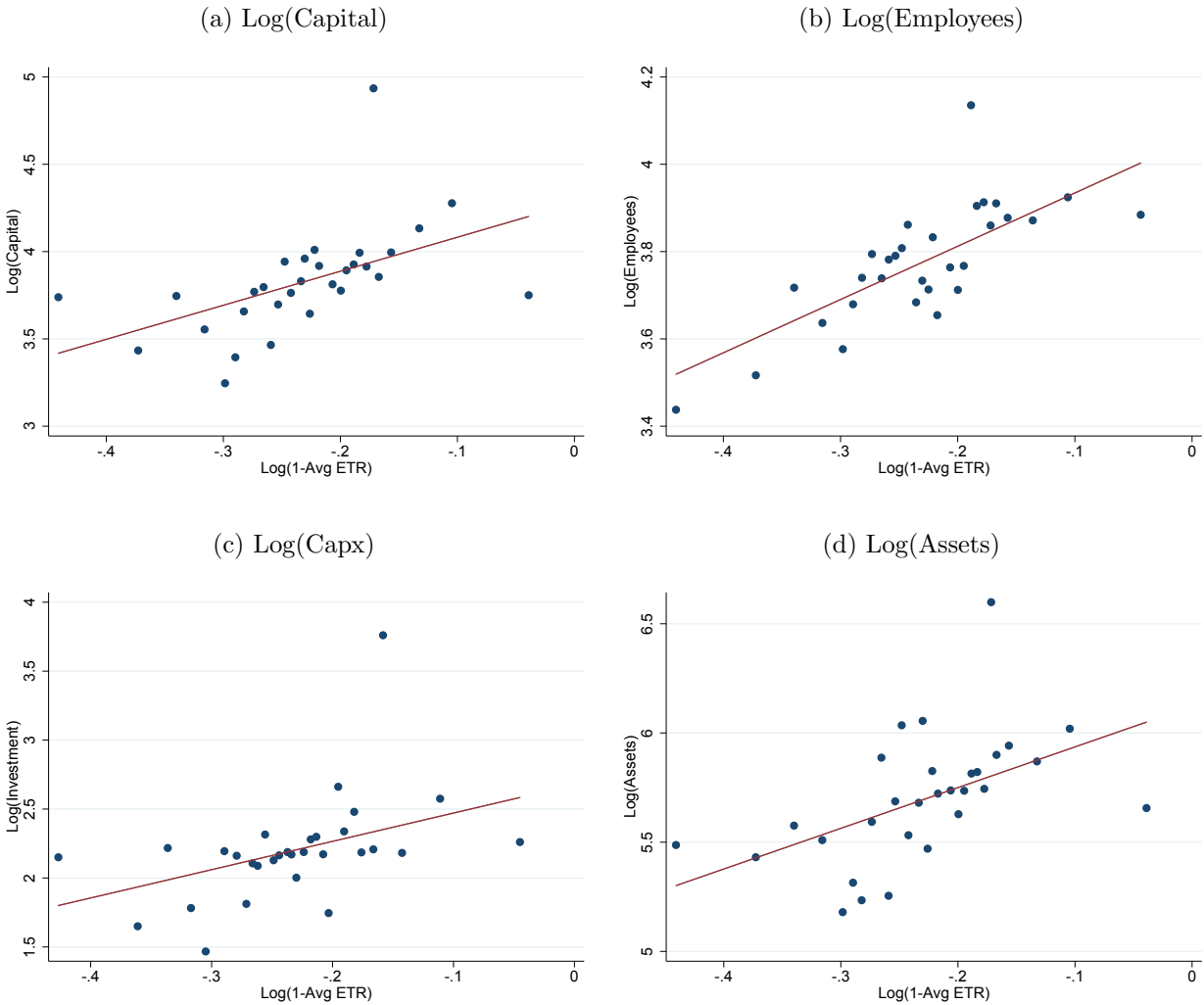
We conclude that classic estimates in the international tax literature stand the test of time and continue to be the benchmark for future international tax research.

Table 1: Sensitivity of U.S. Business Activity Abroad to Effective Tax Rates

	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Log(1-Avg ETR)	1.949** (0.781)	1.220*** (0.363)	2.053** (1.009)	1.863** (0.722)
Log(GDP)	-1.342 (1.136)	-0.330 (0.496)	-1.529 (1.366)	-2.074 (1.418)
Log(GDP per capita)	3.841** (1.654)	2.515*** (0.574)	4.337** (1.870)	4.265** (2.001)
Trade Openness	0.00128 (0.00336)	-0.000170 (0.00121)	0.00268 (0.00407)	0.00821 (0.00509)
Real Exchange Rate	-0.107** (0.0537)	-0.0495*** (0.00939)	-0.347 (0.526)	-0.0701 (0.0510)
Fraser Index	-0.462 (0.326)	0.115 (0.0701)	-0.644** (0.321)	-0.648* (0.335)
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	298	300	274	298
Adj. R2	0.170	0.672	0.180	0.367
Countries	70	70	69	70

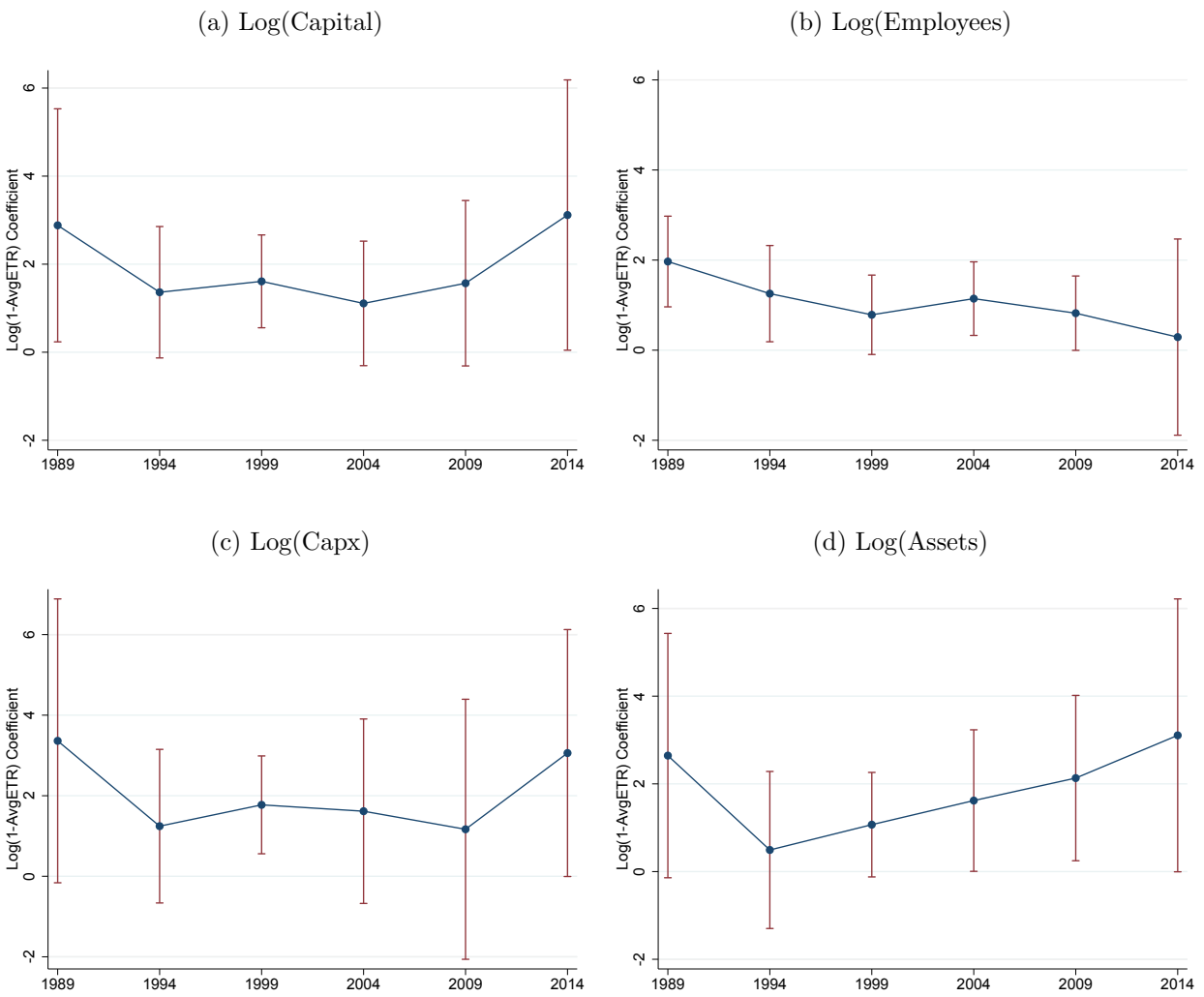
Notes: Table 1 presents baseline results describing the effect of taxation on the location of U.S. business activity abroad. All specifications include country and year fixed effects. Standard errors are presented in parentheses and clustered at the country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Sensitivity of U.S. Business Activity Abroad to Effective Tax Rates; Bin-scatters



Notes: Figure 1 presents bin-scatterplots corresponding to the regression results presented in Table 1. Each bin-scatterplot includes time-varying country controls as well as country and year fixed effects.

Figure 2: Dynamic Sensitivity of U.S. Business Activity Abroad to Effective Tax Rates



Notes: Figure 2 presents estimates of the effect of $\text{Log}(1-\text{ETR})$ on each of the four primary outcomes in each survey year 1989, 1994, 1999, 2004, 2009, and 2014.

Table 2: Sensitivity of U.S. Business Activity Abroad to Effective Tax Rates; IV Estimates

(a) Instrumental Variables Estimates				
	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Log(1-Avg ETR)	1.620** (2.47)	0.326 (0.61)	3.945*** (3.04)	1.529** (2.16)
Observations	92	92	84	92
Countries	26	26	26	26
First Stage F Stat	13.59	13.59	6.9	13.59

(b) OLS Estimates; IV Sample				
	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Log(1-Avg ETR)	1.025** (0.429)	0.392 (0.306)	0.649 (0.430)	1.132*** (0.377)
Observations	93	93	86	93
Countries	26	26	26	26

Notes: Panel (a) of Table 2 presents instrumental variables estimates in which effective tax rates are instrumented using statutory tax rates and base expansion and contraction data from Kawano and Slemrod (2016). Panel (b) presents OLS estimates of the effect of effective tax rates on measures of U.S. business abroad for the sample in Panel (a). Standard errors are presented in parentheses and clustered at the country level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Sensitivity of Business Activity to Effective Tax Rates; Lagged ETR

	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Log(1-Lagged Avg ETR)	1.392** (0.649)	0.968*** (0.317)	1.138 (0.852)	1.388** (0.592)
Observations	289	291	266	289
Countries	70	70	69	70
Adj. R2	0.157	0.675	0.157	0.344

Notes: Table 3 presents estimates of the effect of lagged effective tax rates on the location of U.S. business activity abroad. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Sources: See notes to table ??.

Table 4: Sensitivity of Business Activity to Effective Tax Rates; Alternate Specifications

(a) Inverse Tax Term				
	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
1 / Avg. ETR	0.0206** (0.00880)	0.0141*** (0.00526)	0.0363*** (0.0112)	0.0264*** (0.00982)
Observations	298	300	274	298
Countries	70	70	69	70
Adj. R2	0.153	0.655	0.182	0.363

(b) Quadratic Specification				
	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Tax Rate	-4.373** (2.186)	-2.179 (1.403)	-8.545*** (2.575)	-5.089** (2.363)
Tax Rate ²	3.190 (4.664)	0.956 (2.531)	10.80* (5.985)	4.824 (4.714)
Observations	298	300	274	298
Countries	70	70	69	70
Adj. R2	0.170	0.673	0.192	0.368

(c) Linear Specification				
	(1)	(2)	(3)	(4)
	Log(Capital)	Log(Employees)	Log(Investment)	Log(Assets)
Tax Rate	-2.774*** (1.016)	-1.700*** (0.484)	-3.065** (1.270)	-2.672*** (0.960)
Observations	298	300	274	298
Countries	70	70	69	70
Adj. R2	0.172	0.673	0.185	0.368

Notes: Table 4 uses alternative tax measures to estimate the effect of effective corporate tax rates on the business activity of U.S. multinational subsidiaries operating abroad.

References

- Altshuler, Rosanne, Harry Grubert, and T Scott Newlon**, “Has US investment abroad become more sensitive to tax rates?,” in “International taxation and multinational activity,” University of Chicago Press, 2000, pp. 9–38.
- Grubert, Harry and John Mutti**, “Taxes, tariffs and transfer pricing in multinational corporate decision making,” *The Review of economics and Statistics*, 1991, pp. 285–293.
- and –, “Do taxes influence where US corporations invest?,” *National Tax Journal*, 2000, pp. 825–839.
- Jr, James R Hines and Eric M Rice**, “Fiscal paradise: Foreign tax havens and American business,” *The Quarterly Journal of Economics*, 1994, 109 (1), 149–182.
- Kawano, Laura and Joel Slemrod**, “How do corporate tax bases change when corporate tax rates change? With implications for the tax rate elasticity of corporate tax revenues,” *International Tax and Public Finance*, 2016, 23 (3), 401–433.
- Mutti, John and Harry Grubert**, “Empirical asymmetries in foreign direct investment and taxation,” *Journal of International Economics*, 2004, 62 (2), 337–358.