

**\*\*\* EXTENDED ABSTRACT \*\*\***

**Taxation, Migration, and Innovation: Do Star Scientists Move in Response to Interstate Tax Differences?**

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**Overview**

In this paper, we investigate the extent to which taxes affect the locational decisions of star scientists. Due in large part to a lack of large longitudinal individual data sets, previous research on migration has tended to rely on aggregate data on the stock of persons in a given state or country or on aggregate flows, with little or no information about the income and other characteristics of the individuals within the aggregate. (A recent exception is Kennan and Walker 2011.) Recent work on the tax sensitivity of migration has tended to focus on either highly mobile star athletes in Europe (Kleven, Landais, and Saez 2013) or millionaires within the U.S. (Young and Varner 2013). Very little research has been done on the tax sensitivity of individuals thought to be especially economically productive and sought-after by jurisdictions.

Using data on the universe of U.S. patents filed between 1976 and 2010 (from Zucker, Darby, & Fong 2011), we identify star scientists as those whose patent counts place them at the top end of the distribution (i.e., top 10%, 5%, or 1%). All inventors on a patent are required to list their state of residence. By virtue of being prolific patenters, these star scientists tend to be observed in the patent database for many consecutive years, allowing us to observe their location and migration decisions (within the U.S.). We find that a little over 5% of stars change states at least once during the sample period. Moreover, there has been a secular rise in the internal migration rate of star scientists over the past three decades, which contrasts with the secular decline documented for the general population (Kaplan & Schulhofer-Wohl 2013).

We combine this patenter data with a rich comprehensive panel data set that we compiled on personal and business tax and credit rates at the state-year level.<sup>1</sup> Specifically, we consider 15 tax variables: the marginal and average tax rates at the 50<sup>th</sup>, 95<sup>th</sup>, 99<sup>th</sup>, and 99.9<sup>th</sup> percentiles of individual income (based on the national distribution); the corporate income tax rate; the R&D tax credit rate; the investment tax credit rate; and the implied user costs of R&D capital and physical capital (Hall & Jorgenson 1963).

Our empirical analysis is motivated by a random utility model in which scientists derive utility from after-tax income net of moving costs and idiosyncratic preferences, and each period choose where to locate among the 50 U.S. states. In this model, tax and credit rates in each potential destination state matter for individuals' location choice.<sup>2</sup> A simple generalization of the model allows for the possibility that tax and credit rates in the individual's current state matter more or less than tax and credit rates in other potential location choices. We estimate both an individual-level logit model (which allows for individual covariates) on the move-or-stay choice and a log odds-ratio model of destination choice at the level of origin-destination state pairs (which assumes individual covariates are uncorrelated with state tax rates)(McFadden 1976). In both cases, we condition on state-pair ordered fixed effects and year fixed effects. For each tax or credit, we estimate the percent change in the probability of locating in a given destination state in response to a 1% change in after-tax income (due to a change in that tax or credit).

## Main Results

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<sup>1</sup> From the NBER's TaxSim calculator, we obtained both marginal and average individual income tax rates by state and year for a hypothetical scientist whose salary and capital gains income are at a specific national income percentile for that year (50<sup>th</sup>, 95<sup>th</sup>, 99<sup>th</sup>, or 99.9<sup>th</sup> percentile). The national income percentiles are obtained from the World Top Incomes Database (Alvaredo, Atkinson, Piketty & Saez 2013). We obtain statutory rates by state and year for corporate income taxes, investment tax credits, and research and development tax credits from Chirinko & Wilson (2008), Wilson (2009), and Moretti & Wilson (2014).

<sup>2</sup> Individual of course do not directly pay the corporate tax nor do they in general directly benefit from R&D and investment tax credits. But they may be indirectly affected by these business tax policies both because the individuals may be attached to mobile firms and because part of the economic incidence of these policies is borne by individuals who work for businesses.

We begin our empirical analysis by simply plotting the distribution of interstate tax differentials (destination state tax rate minus origin state tax rate) over all moving star scientists. If taxes do not matter, we would expect a symmetric distribution, whereas if higher tax rates deter immigration and/or spur emigration, we would expect more mass of the distribution to the left of zero. For nearly all of the tax variables we look at, we find a roughly symmetric distribution over the full sample. However, this turns out to be driven nearly entirely by high average net migration into California, a high-tax state with a large technology sector. This reveals the importance of controlling for state (or even state-pair) fixed effects. Excluding California alone leads to a clear asymmetric distribution, as is illustrated in Figure 1 below for the interstate differential in the marginal tax rate for 95<sup>th</sup> percentile income. We find a similarly symmetric distribution for the corporate income tax (CIT) rate differential. Yet, when we generate separate distributions (over the CIT rate differential) for star scientists who work for a corporation and for those who do not, we find that the corporate scientists' distribution is shifted noticeably left of the non-corporate distribution, indicating that corporate scientists are relatively more likely to move from a high-CIT state to a low-CIT state than are non-corporate scientists. This lends credibility to our identification assumption that star scientists' migration decisions are causally influenced by interstate tax differentials.

The key regression results are shown in the tables below. We first estimate a simple move-or-stay logit model (as a function of the individual's current (origin) state tax policy). Table 4.2 shows the main results for the move-or-stay logit model, where we estimate the model separately for each tax or credit rate. The sample consists of roughly 260,000 star-scientist\*year observations, where a star scientist here is defined as an inventor whose past 10 years' patent count puts them above the 95<sup>th</sup> percentile of inventors in that year. The key independent variable is the log of the net-of-tax rate:  $\log(1 - \tau_{ot})$ , where  $\tau_{ot}$  is a tax or credit rate in the origin state,  $o$ , in year  $t$ . The net-of-tax rate, and hence after-tax income, decreases with a tax and increases with a credit. We thus would expect a positive (or zero) coefficient on this

regressor when it is measured using a tax rate – i.e., a higher probability of moving when the origin state raises its tax rate – and a negative (or zero) coefficient on this regressor when it is measured using a credit rate. This is exactly what is found – for all tax and credit variables (except for the R&D capital user cost which has a negative but insignificant coefficient) – in Table 4.2.

Next we estimate a series of OLS regressions of the log outmigration rate (number of scientists moving from state  $o$  to state  $d$  divided by number of scientists in  $o$ ) or the log odds ratio (log of the number of scientists moving from  $o$  to  $d$  divided by number staying in  $o$ ) on the differential in the net-of-tax rate between  $d$  and  $o$ . A positive (negative) coefficient on a tax (credit) rate indicates that a lower tax rate (higher credit rate) in the destination state is associated with a higher probability of moving from  $o$  to  $d$ . Controlling for either origin and destination state fixed effects or for state-pair fixed effects, we find strong evidence that tax differentials matter significantly in the expected direction – see Table 7.2. The effects are much weaker and more imprecise when we attempt to control for state-specific or state-pair-specific time trends, perhaps because the trends absorb some of the tax effects which may be gradual.

Table 8.7 puts the four main tax and credit variables in the same regression simultaneously to assess whether they have independent effects. We generally find that all four – the corporate income tax (CIT) rate, the investment credit (ITC) rate, the R&D credit rate, and the individual marginal tax rate (for someone at the 99<sup>th</sup> income percentile) – significantly affect star scientists' migration decisions. Table 9.2 repeats the regressions in Table 7.2 but relaxes the constraint that the effect of the origin state's tax variable is equal but of opposite sign to the effect of the destination tax variable. We generally find that for individual income taxes, the origin state's tax value matters more than that of the destination state, while for business taxes and credits, the destination state's value matters more or the two matter about the same. Lastly, Table 10.7 repeats the regressions in Table 8.7 but allowing asymmetric

effects. Origin state appears to matter more for the corporate income tax rate and the individual marginal tax rate, while the destination state matters more for the R&D credit. Destination and origin matter about equally for the investment tax credit rate.

The above results are preliminary. We currently are working on a number of extensions, placebo checks, and robustness checks.

Figure 1. Distribution of Interstate Tax Differentials Over Moving Stars

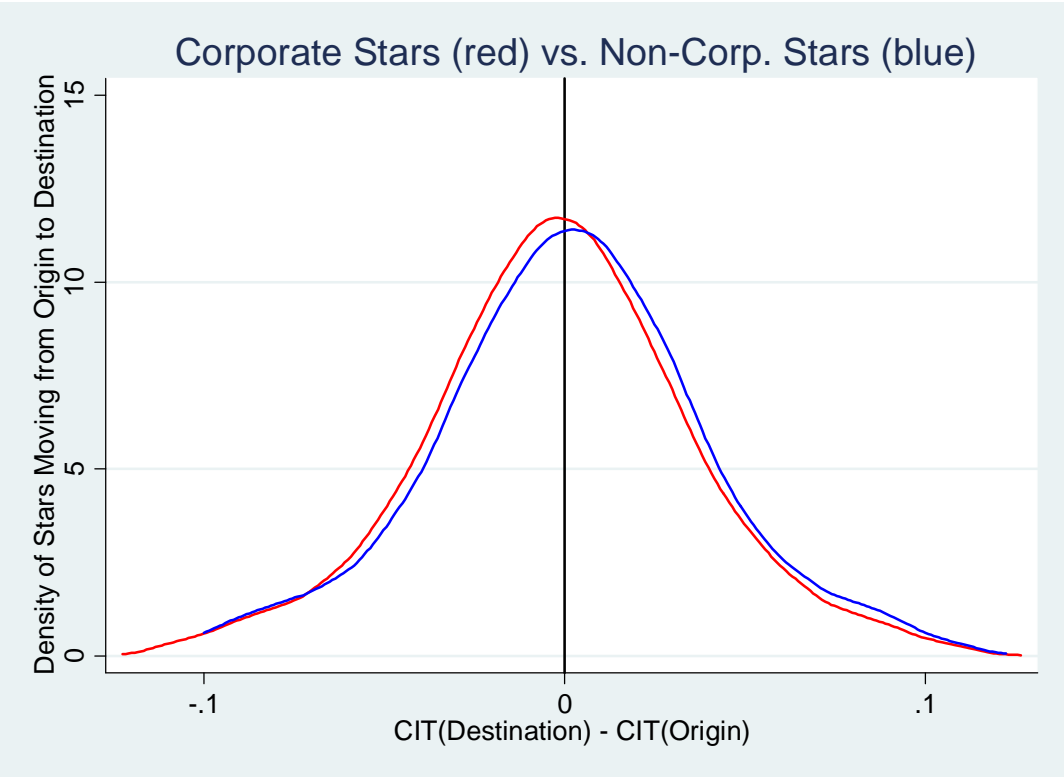
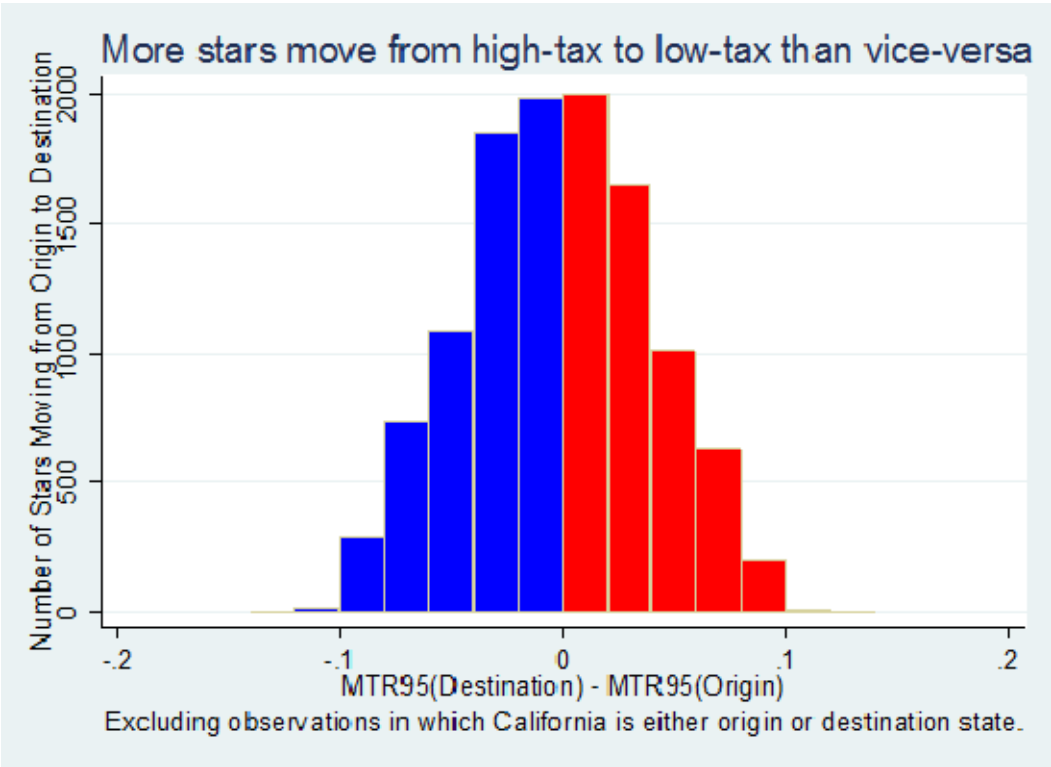


Table 4.2: Individual-Level Decision of Migrate vs Stay  
 Logit Model, State Fixed Effects  
 Star 95th Percentile

Tax Variable	MTR 99.9 %	MTR 99 %	MTR 95 %	MTR 50 %	CIT Rate	ITC	User Cost of Capital	R&D Credit	R&D User Cost	ATR 99.9 %	ATR 99 %	ATR 95 %	ATR 50 %
Tax Variable	5.1622*** (0.8673)	4.9204*** (0.9085)	5.3064*** (0.8980)	1.7858* (1.0835)	2.1891* (1.2161)	-3.1461*** (0.6735)	10.0826*** (1.6609)	-0.0146 (0.3242)	-0.0656 (0.3807)	4.9923*** (1.2881)	4.0814*** (1.2710)	4.3809*** (1.4649)	3.7334* (1.9773)
<b>Org. Type</b> (Omitted: Firm)													
University	0.1278*** (0.0420)	0.1280*** (0.0420)	0.1276*** (0.0419)	0.1221*** (0.0419)	0.1289*** (0.0420)	0.1109*** (0.0428)	0.1089** (0.0428)	0.1289*** (0.0420)	0.1289*** (0.0419)	0.1286*** (0.0420)	0.1293*** (0.0419)	0.1288*** (0.0419)	0.1217*** (0.0419)
US Government	-0.0622 (0.0716)	-0.0617 (0.0716)	-0.0598 (0.0716)	-0.0470 (0.0741)	-0.0562 (0.0717)	-0.0773 (0.0721)	-0.0818 (0.0721)	-0.0568 (0.0717)	-0.0568 (0.0717)	-0.0574 (0.0717)	-0.0575 (0.0717)	-0.0572 (0.0716)	-0.0460 (0.0741)
Other	0.0202 (0.0588)	0.0208 (0.0588)	0.0210 (0.0588)	0.0343 (0.0591)	0.0242 (0.0588)	0.0292 (0.0590)	0.0285 (0.0589)	0.0235 (0.0589)	0.0237 (0.0589)	0.0215 (0.0589)	0.0226 (0.0588)	0.0227 (0.0588)	0.0345 (0.0591)
<b>Tech Field</b> (Omitted: Bio/Chem)													
Computer Science	0.1131*** (0.0305)	0.1128*** (0.0305)	0.1129*** (0.0305)	0.1029*** (0.0304)	0.1103*** (0.0305)	0.1216*** (0.0310)	0.1222*** (0.0310)	0.1093*** (0.0304)	0.1093*** (0.0304)	0.1105*** (0.0304)	0.1104*** (0.0304)	0.1110*** (0.0304)	0.1026*** (0.0304)
Other Engineering	0.0423** (0.0204)	0.0421** (0.0204)	0.0421** (0.0204)	0.0358* (0.0206)	0.0404** (0.0203)	0.0527*** (0.0201)	0.0515** (0.0201)	0.0404** (0.0203)	0.0405** (0.0203)	0.0408** (0.0203)	0.0411** (0.0203)	0.0413** (0.0203)	0.0354* (0.0206)
Other Science	-0.0702** (0.0333)	-0.0702** (0.0333)	-0.0703** (0.0333)	-0.0737** (0.0338)	-0.0701** (0.0333)	-0.0616* (0.0330)	-0.0631* (0.0330)	-0.0702** (0.0333)	-0.0701** (0.0333)	-0.0705** (0.0333)	-0.0703** (0.0333)	-0.0700** (0.0334)	-0.0735** (0.0338)
Semiconductor	-0.2273*** (0.0469)	-0.2280*** (0.0469)	-0.2270*** (0.0469)	-0.2392*** (0.0473)	-0.2313*** (0.0469)	-0.2201*** (0.0480)	-0.2191*** (0.0481)	-0.2331*** (0.0468)	-0.2331*** (0.0468)	-0.2316*** (0.0468)	-0.2337*** (0.0468)	-0.2321*** (0.0468)	-0.2393*** (0.0473)

Standard errors in parentheses

All regressions include both year and state fixed effects

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7.2: State Tax Rate Differentials  
 Single Independent Variable per Regression  
 Star 95th Percentile

	Log Outmig. Rate (1)	Log Odds Ratio (2)	Log Outmig. Rate (3)	Log Odds Ratio (4)	Log Odds Ratio (5)	Log Odds Ratio (6)
	Inc. Zero, OLS	Exc. Zero, OLS	Inc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS
MTR, 99.9th Perc.	2.7411*** (0.4587)	2.9227*** (0.4729)	2.7574*** (0.4919)	2.8791*** (0.5767)	0.4067 (0.4140)	0.3024 (0.4986)
MTR, 99th Perc.	2.6023*** (0.4704)	2.7786*** (0.4841)	2.5867*** (0.5073)	2.6982*** (0.5803)	0.1352 (0.4112)	-0.0046 (0.5029)
MTR, 95th Perc.	2.5914*** (0.4746)	2.7773*** (0.4877)	2.5486*** (0.5121)	2.6783*** (0.5915)	-0.2420 (0.4249)	-0.3787 (0.5223)
MTR, 50th Perc.	1.7963*** (0.5727)	1.8287*** (0.5776)	1.7120*** (0.6402)	1.6412** (0.6923)	-1.0424 (0.6439)	-1.6024** (0.7773)
State CIT Rate	2.3960*** (0.6319)	2.4374*** (0.6415)	2.3129*** (0.6836)	2.4843*** (0.7304)	1.0861** (0.4750)	1.4580** (0.6485)
State ITC	-1.8420*** (0.3862)	-1.9719*** (0.3920)	-1.8781*** (0.4228)	-2.0566*** (0.5169)	-0.7535** (0.2992)	-1.2912*** (0.4089)
User Cost of Capital	6.2784*** (0.8230)	6.6225*** (0.8391)	6.1651*** (0.9159)	6.6694*** (1.2580)	0.4961 (0.6290)	1.7196** (0.8605)
R&D Credit	-0.5314*** (0.1728)	-0.5364*** (0.1782)	-0.5223*** (0.1922)	-0.5341** (0.2130)	0.0157 (0.1384)	-0.0217 (0.1655)
R&D User Cost	0.2779 (0.1694)	0.2839 (0.1738)	0.2462 (0.1852)	0.2687 (0.1970)	-0.0345 (0.1256)	0.0391 (0.1598)
ATR, 99.9th Perc.	0.3076 (0.2329)	0.3249 (0.2376)	0.3483 (0.2247)	0.3671 (0.2577)	-0.0366 (0.1708)	-0.1381 (0.2032)
ATR, 99th Perc.	0.1806 (0.2998)	0.2043 (0.3064)	0.1808 (0.3040)	0.1794 (0.3387)	-0.1120 (0.2362)	-0.2200 (0.3147)
ATR, 95th Perc.	2.1610*** (0.3803)	2.2248*** (0.3862)	2.1550*** (0.4061)	2.1879*** (0.4665)	-0.7663** (0.3295)	-0.9517** (0.4231)
ATR, 50th Perc.	4.8497*** (0.7938)	4.9003*** (0.8179)	4.5641*** (0.8695)	4.6192*** (0.9270)	0.9626 (0.7290)	0.6116 (0.9299)
No. Observations	11529	11510	11529	11510	11510	11510
Origin & Destination State Fixed Effects	Yes	Yes	No	No	Yes	No
Origin*Destination Pair Fixed Effects	No	No	Yes	Yes	No	Yes
Origin Fixed Effects *						
Year Time Trend	No	No	No	No	Yes	No
Pair Fixed Effects *						
Year Time Trend	No	No	No	No	No	Yes

Standard errors in parentheses  
 All regressions include year fixed effects  
 \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Table 8.7: State Tax Rate Differentials  
Multiple Independent Variables per Regression  
Star 95th Percentile, Tax Rate 99th Percentile

	Log Outmig. Rate (1)	Log Odds Ratio (2)	Log Outmig. Rate (3)	Log Odds Ratio (4)	Log Odds Ratio (5)	Log Odds Ratio (6)
	Inc. Zero, OLS	Exc. Zero, OLS	Inc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS
State ITC	-1.7101*** (0.3658)	-1.8434*** (0.3714)	-1.7297*** (0.3972)	-1.9086*** (0.4967)	-0.7230** (0.3019)	-1.2584*** (0.4117)
R&D Credit	-0.4243*** (0.1582)	-0.4202*** (0.1625)	-0.4414** (0.1747)	-0.4343** (0.2061)	-0.0297 (0.1421)	-0.0883 (0.1652)
State CIT Rate	2.2281*** (0.6648)	2.1848*** (0.6698)	2.0618*** (0.7253)	2.1898*** (0.7930)	0.8949* (0.5339)	1.2444* (0.7363)
State MTR, 99th Perc.	2.3622*** (0.4572)	2.5114*** (0.4678)	2.3173*** (0.4918)	2.4161*** (0.5742)	0.0387 (0.4348)	-0.2192 (0.5269)
Pair Distance	-0.0000* (0.0000)	-0.0000* (0.0000)			-0.0001* (0.0000)	
No. Observations	e(N)	e(N)	e(N)	e(N)	e(N)	e(N)
Origin & Destination State Fixed Effects	Yes	Yes	No	No	Yes	No
Origin*Destination Pair Fixed Effects	No	No	Yes	Yes	No	Yes
Origin Fixed Effects * Year Time Trend	No	No	No	No	Yes	No
Pair Fixed Effects * Year Time Trend	No	No	No	No	No	Yes

Standard errors in parentheses

All regressions include year fixed effects

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 9.2: State Tax Rates, Origin & Destination States  
 Single Independent Variable per Regression  
 Star 95th Percentile

	Log Outmig. Rate (1) Inc. Zero, OLS	Log Odds Ratio (2) Exc. Zero, OLS	Log Outmig. Rate (3) Inc. Zero, OLS	Log Odds Ratio (4) Exc. Zero, OLS	Log Odds Ratio (5) Exc. Zero, OLS	Log Odds Ratio (6) Exc. Zero, OLS
MTR, 99.9th Perc. Origin	-0.0021 (0.0036)	-4.8508*** (0.7904)	-0.0021 (0.0036)	-4.4903*** (0.8668)	0.0467 (0.6101)	0.2738 (0.7583)
MTR, 99.9th Perc. Dest.	0.0121*** (0.0047)	0.9067 (0.7226)	0.0122*** (0.0046)	1.1713 (0.7830)	0.8706 (0.5834)	0.8897 (0.7146)
MTR, 99th Perc. Origin	-0.0021 (0.0037)	-4.4476*** (0.8049)	-0.0021 (0.0037)	-4.0500*** (0.8851)	0.4575 (0.5981)	0.7229 (0.7510)
MTR, 99th Perc. Dest.	0.0110** (0.0047)	1.0362 (0.7487)	0.0109** (0.0046)	1.2655 (0.8121)	0.7448 (0.6015)	0.7380 (0.7392)
MTR, 95th Perc. Origin	-0.0034 (0.0037)	-4.6714*** (0.8200)	-0.0034 (0.0037)	-4.2297*** (0.9020)	0.7455 (0.6105)	1.0068 (0.8014)
MTR, 95th Perc. Dest.	0.0136*** (0.0052)	0.8021 (0.7530)	0.0135*** (0.0051)	1.0375 (0.8225)	0.2721 (0.6126)	0.2593 (0.7371)
MTR, 50th Perc. Origin	-0.0002 (0.0050)	-3.8888*** (0.8725)	-0.0001 (0.0050)	-3.6072*** (0.9838)	2.0481** (0.9896)	2.4374** (1.2084)
MTR, 50th Perc. Dest.	0.0207* (0.0111)	-0.2669 (0.8734)	0.0223* (0.0114)	-0.3295 (0.9613)	-0.0689 (0.9350)	-0.7866 (1.0816)
State CIT Rate - Origin	-0.0007 (0.0055)	-3.2665*** (1.0367)	-0.0007 (0.0055)	-3.1078*** (1.1302)	-1.1893* (0.6858)	-1.3535 (0.8586)
State CIT Rate - Dest.	0.0060 (0.0081)	1.5838* (0.8889)	0.0048 (0.0079)	1.8469* (0.9985)	0.9801 (0.8211)	1.5688 (1.0170)
State ITC - Origin	0.0028 (0.0044)	2.2277*** (0.5702)	0.0028 (0.0044)	1.9011*** (0.6520)	0.3464 (0.4867)	0.7497 (0.5565)
State ITC - Dest.	-0.0074 (0.0066)	-1.7264*** (0.6083)	-0.0072 (0.0068)	-2.2068*** (0.7249)	-1.1482** (0.5417)	-1.8164*** (0.5981)
User Cost of Capital - Origin	-0.0270** (0.0134)	-8.7344*** (1.3586)	-0.0271** (0.0134)	-7.4168*** (1.6106)	0.3266 (1.0450)	-0.7064 (1.1767)
User Cost of Capital - Dest.	0.0243* (0.0142)	4.5596*** (1.4399)	0.0217 (0.0148)	5.9319*** (1.7523)	1.2994 (1.1754)	2.7168** (1.2470)
R&D Credit - Origin	-0.0017 (0.0020)	0.1848 (0.2668)	-0.0017 (0.0020)	-0.1049 (0.3014)	-0.4638** (0.2085)	-0.4874** (0.2391)
R&D Credit - Dest.	-0.0046** (0.0020)	-0.8716*** (0.2739)	-0.0045** (0.0019)	-1.1535*** (0.3205)	-0.4187** (0.2038)	-0.5102** (0.2459)
R&D User Cost Origin	0.0013 (0.0020)	0.4946* (0.2577)	0.0013 (0.0020)	0.8290*** (0.2775)	0.4211** (0.1899)	0.4561** (0.2224)
R&D User Cost Dest.	0.0041* (0.0025)	1.0566*** (0.2668)	0.0038 (0.0023)	1.3616*** (0.3002)	0.3526* (0.1838)	0.5362** (0.2247)
ATR, 99.9th Perc. Origin	-0.0039* (0.0023)	-0.6693 (0.4346)	-0.0039* (0.0023)	-0.8113* (0.4460)	0.0404 (0.2473)	-0.0130 (0.3075)
ATR, 99.9th Perc. Dest.	0.0006 (0.0018)	0.0500 (0.3235)	0.0006 (0.0017)	0.0139 (0.3451)	-0.0337 (0.2385)	-0.2507 (0.3027)
ATR, 99th Perc. Origin	-0.0039	-0.2982	-0.0039	-0.3313	0.4302	0.5158

	(0.0029)	(0.5013)	(0.0029)	(0.5139)	(0.3367)	(0.4253)
ATR, 99th Perc. Dest.	0.0007 (0.0031)	0.1166 (0.4573)	0.0001 (0.0030)	0.0369 (0.4845)	0.1632 (0.3410)	0.0298 (0.4503)
ATR, 95th Perc. Origin	-0.0059 (0.0038)	-3.9071*** (0.6065)	-0.0059 (0.0038)	-3.8235*** (0.6386)	1.3708*** (0.4412)	1.1916** (0.5871)
ATR, 95th Perc. Dest.	0.0067 (0.0049)	0.4354 (0.6033)	0.0061 (0.0047)	0.4403 (0.6661)	-0.1438 (0.4537)	-0.7039 (0.6073)
ATR, 50th Perc. Origin	-0.0007 (0.0083)	-8.4692*** (1.2244)	-0.0007 (0.0083)	-8.2174*** (1.3976)	-1.3800 (1.0666)	-0.9480 (1.4107)
ATR, 50th Perc. Dest.	0.0302* (0.0159)	1.2640 (1.1680)	0.0304* (0.0161)	1.0538 (1.2739)	0.5417 (1.1221)	0.2785 (1.3722)
No. Observations	76700	11510	76700	11510	11510	11510
Origin & Destination State Fixed Effects	Yes	Yes	No	No	Yes	No
Origin*Destination Pair Fixed Effects	No	No	Yes	Yes	No	Yes
Origin Fixed Effects * Year Time Trend	No	No	No	No	Yes	No
Pair Fixed Effects * Year Time Trend	No	No	No	No	No	Yes

Standard errors in parentheses

All regressions include year fixed effects

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 10.7: State Tax Rate - Origin & Destination States  
Multiple Independent Variables per Regression  
Star 95th Percentile, Tax Rate 99th Percentile

	Log Outmig. Rate (1)	Log Odds Ratio (2)	Log Outmig. Rate (3)	Log Odds Ratio (4)	Log Odds Ratio (5)	Log Odds Ratio (6)
	Inc. Zero, OLS	Exc. Zero, OLS	Inc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS	Exc. Zero, OLS
State ITC - Origin	0.0027 (0.0044)	2.1377*** (0.5646)	0.0027 (0.0044)	1.8252*** (0.6423)	0.2848 (0.4940)	0.6695 (0.5606)
State ITC - Dest.	-0.0074 (0.0067)	-1.5733*** (0.5794)	-0.0072 (0.0069)	-1.9817*** (0.6763)	-1.1580** (0.5448)	-1.8350*** (0.6038)
R&D Credit - Origin	-0.0016 (0.0019)	-0.0022 (0.2652)	-0.0016 (0.0019)	-0.2834 (0.2985)	-0.3643* (0.2082)	-0.3167 (0.2379)
R&D Credit - Dest.	-0.0034 (0.0023)	-0.8295*** (0.2660)	-0.0031 (0.0022)	-1.1403*** (0.3074)	-0.4097** (0.2048)	-0.4812** (0.2434)
State CIT Rate - Origin	0.0009 (0.0071)	-3.3197*** (1.1458)	0.0009 (0.0071)	-3.1693** (1.2696)	-1.6886** (0.7893)	-2.1694** (1.0109)
State CIT Rate - Dest.	0.0138 (0.0096)	0.9282 (0.9467)	0.0122 (0.0096)	1.0967 (1.0733)	0.1709 (0.8598)	0.3573 (1.0787)
Origin State MTR, 99th Perc.	-0.0010 (0.0039)	-3.9045*** (0.8096)	-0.0010 (0.0039)	-3.4476*** (0.8821)	0.2907 (0.6271)	0.5814 (0.7773)
Destination State MTR, 99th Perc.	0.0091* (0.0047)	1.0764 (0.7330)	0.0091** (0.0046)	1.3260* (0.7942)	0.3652 (0.6110)	0.1153 (0.7759)
Pair Distance	-0.0000*** (0.0000)	-0.0000* (0.0000)			-0.0001* (0.0000)	
Origin & Destination State Fixed Effects	Yes	Yes	No	No	Yes	No
Origin*Destination Pair Fixed Effects	No	No	Yes	Yes	No	Yes
Origin Fixed Effects * Year Time Trend	No	No	No	No	Yes	No
Pair Fixed Effects * Year Time Trend	No	No	No	No	No	Yes

Standard errors in parentheses  
All regressions include year fixed effects  
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$