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# Tax Flight Has Tangible Effects On Income Tax Revenue

*by Roger Cohen, Andrew Lai, and Charles Steindel*

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**Summary**

Using annual IRS migration data from 1992 to 2009, we study how income taxes and other economic factors affect the migration flows of taxpayers and income. Our results indicate that variations in differential average marginal tax rates are associated with small but significant effects on net outmigration from a state. Calibrating the model for New Jersey, we estimate that by the end of the decade, the state's cumulative losses from increases in average marginal tax rates after 2003 (most importantly the 2004 millionaire tax) totaled roughly 18,000 taxpayers and $2.4 billion in annual income.

**Background**

The tax flight controversy has resurfaced, as legislators in cash-strapped states seek new sources of revenue following the 2007-2009 recession and the more recent loss of federal stimulus funds. The concept of tax flight — the migration of individuals from higher- to lower-taxed states — is simple enough to understand. However, the historical migration evidence has been somewhat difficult to interpret, which is unsurprising when we consider the complex nature of migration and the ever-changing array of state taxes. Unsurprisingly, there remains heated debate among policymakers and academics over the size (and indeed, the existence) of tax flight and its effect on tax revenue.

Tax flight has played a particularly prominent role in recent debates over so-called millionaire taxes, which are targeted higher-income tax rates on high-income earners.[1] Enacted or proposed in California, New Jersey, New York, Maryland, and Hawaii, these taxes have received extensive coverage in the press, including in the pages of this publication.

Proponents argue that while millionaire taxes do raise significant revenue — in New Jersey's case, the temporary 2009 millionaire tax is estimated to have raised about $560 million[2] — their effect on individual taxpayers is too small to affect migration decisions. Opponents reject the characterization of millionaire taxes as a "free lunch." They argue that millionaire taxes are sufficient to drive a significant number of wealthy taxpayers out of a state and hurt a state's economic competitiveness.

In our study, we examine interstate migration flows in the United States from 1992 to 2009 and relate them to state income tax rates. This approach allows us to measure the effect of each state's income

[1]Taken literally, the term "millionaire tax" is often a misnomer, because the taxes it describes are frequently applied to taxpayers earning less than $1 million. For example, New Jersey's 2004 millionaire tax laws raised rates for those making between $500,000 and $1 million as well as for true millionaires. In any case, the term "millionaire tax" has long been applied to the levy and is standard in many discussions.

[2]New Jersey's 2009 law not only increased tax rates on incomes above $400,000 but also rolled back deductions for property tax payments and rents for filers earning more than $150,000.

taxes on its migration flows and empirically test whether tax flight has statistically significant effects. Our detailed results are described in a recent New Jersey Treasury study.[3]

We place particular emphasis on New Jersey migration in our analysis because of the Garden State's consistent migration losses over the past 20 years and the state's recent millionaire taxes, 2004's "permanent" tax, and 2009's one-year surcharges. Out-migration from New Jersey has been attributed to many factors — certainly the state's tax burden, but also high housing and living costs and the shift of economic activity out of the Northeast over the past 50 years.[4] But what specific role does New Jersey's income tax play, if any, in driving people out of the state?

## Method and Results

In this report, we take a broad look at the effect of state income tax differentials on domestic migration in the United States. We integrate two unique datasets: the annual IRS series on movements of taxpayers and income, and the National Bureau of Economic Research TAXSIM series on state average marginal tax rates.[5] Our modeling strategy has the following characteristics:

- We measure migration two ways: movement of taxpayers (individuals) and movement of adjusted gross income.
- The migration data consist of aggregated flows to and from each state and the District of Columbia. (We lack information about individual migrants and their characteristics.) For each of the 51 possible origins (50 states + the district), there are 50 potential destinations, for a total of 51*50 = 2,550 observations per year.
- Our migration data do not include taxpayers who file extensions. According to the IRS, this may cause rich households to be underrepresented.[6]
- We restrict our analysis to domestic migrants only, because they are the ones most likely to be influenced by differences in state tax rates.
- We use the average marginal income tax rate on wages to measure a state's tax burden. The average marginal tax rate is the additional revenue received by the state from an additional dollar of income that leaves the pretax distribution of income unchanged.

To estimate the effect of state income tax on interstate migration, we estimate the following linear equations:

$$\begin{aligned}\text{Outmigration\_population}_{i,j,t} = {} & \beta_0 + \beta_1\text{Housing\_price}_{i,j,t-1} + \beta_2\text{Unemployment\_rate}_{i,j,t-1} + \\ & \beta_3\text{Average\_MTR}_{i,j,t-1} + \beta_4\text{Population}_{i,j,t-1} + \beta_5\text{Distance}_{i,j} + \beta_6\text{Distance}^2_{i,j} + \\ & \beta_7\text{Foreclosure\_rate}_{i,j,t-1} + \beta_8\text{Average\_MTR}_{i,j,t-1}*\text{Distance}_{i,j-1} + \\ & \Sigma\alpha_1\text{state}_i + \Sigma\alpha_2\text{state}_j + \varepsilon_{i,j,t}\end{aligned} \quad \text{[Eq. 1]}$$

$$\begin{aligned}\text{Outmigration\_income}_{i,j,t} = {} & \beta_0 + \beta_1\text{Housing\_price}_{i,j,t-1} + \beta_2\text{Unemployment\_rate}_{i,j,t-1} + \\ & \beta_3\text{Average\_MTR}_{i,j,t-1} + \beta_4\text{P opulation}_{i,j,t-1} + \beta_5\text{Distance}_{i,j} + \beta_6\text{Distance}^2_{i,j} + \\ & \beta_7\text{Foreclosure\_rate}_{j,t-1} + \beta_8\text{Average\_MTR}_{i,j,t-1}*\text{Distance}_{i,j} + \\ & \Sigma\alpha_1\text{state}_i + \Sigma\alpha_2\text{state}_j + \varepsilon_{i,j,t}\end{aligned} \quad \text{[Eq. 2]}$$

where

- $\text{outmigration\_population}_{i,j,t}$ = the number of taxpayers moving from state *i* to state *j*, divided by the number of taxpayers remaining in state *i*.
- $\text{outmigration\_income}_{i,j,t}$ = the total AGI moving from state *i* to state *j*, divided by the total AGI remaining in state *i*.
- $\text{housing\_price}_{i,j,t-1}$ = the difference between median home prices in state *i* and state *j* in year *t-1*.
- $\text{unemployment\_rate}_{i,j,t-1}$ = the difference between unemployment rates in state *i* and state *j* in year *t-1*.
- $\text{average\_MTR}_{i,j,t-1}$ = the difference between the weighted average marginal tax rate in state *i* and state *j* in year *t-1*.
- $\text{population}_{i,j,t-1}$ = the difference between the populations of state *i* and state *j* in 2000.
- $\text{distance}_{i,j}$ = the distance between the centers of population of state *i* and state *j* in 2010.
- $\text{foreclosure\_rate}_{j,t-1}$ = the foreclosure rate in state *j* in year *t-1*.
- $\text{state}_i$ = 1 if the origin state is *i*; 0 otherwise.
- $\text{state}_j$ = 1 if the destination state is *j*; 0 otherwise.

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[3]Roger Cohen, Andrew Lai, and Charles Steindel, 2011, "The Effects of Marginal Tax Rates on Interstate Migration in the U.S.," *available at* http://www.state.nj.us/treasury/gsef/OCE-Migration-Study.pdf.

[4]Ashlea Ebeling, 2010, "Wealthy Avoid New Jersey," *available at* http://www.forbes.com/2010/02/04/state-estate-income-tax-migration-personal-finance-rich-avoid-new-jersey.html. Presumably, New Jersey was for a long time relatively unaffected by out-migration from the Northeast, since the state actually gained in-migrants from New York and Philadelphia as suburbanization progressed. In recent years, extensive growth of suburbs has largely ceased, and, in effect, the state has become close to "fully developed," allowing greater traction for the regional forces to take hold.

[5]Daniel Feenberg, 2011, *available at* http://www.nber.org/~taxsim/state-marginal/avrate.html.

[6]Emily Gross, 2003, "U.S. Population Migration Data: Strengths and Limitations," *available at* http://www.irs.gov/pub/irs-soi/99gross_update.doc.

| Table 1. | | | |
|---|---|---|---|
| | Out-Migration Ratio (Returns) | | |
| | (1) | (2) | (3) |
| | National — No State Fixed Effects | National — With State Fixed Effects | NJ Only — No Fixed Effects |
| Housing price | -4.7E-7** | -4.8E-7** | -2.1E-6** |
| Unemployment rate | -4.0E-5** | -1.4E-5* | -5.4E-5** |
| Distance | -8.3E-7** | -1.3E-6** | -6.4E-7** |
| Distance$^2$ | 1.0E-10** | 1.3E-10** | 7.6E-11* |
| State population | 9.3E-8** | 2.8E-8* | 1.3E-7** |
| Foreclosure rate | -4.4E-5** | -3.8E-5** | -3.9E-5* |
| Average marginal tax rate | -2.4E-5** | -3.4E-5* | -2.0E-5* |
| MTR * distance (interaction) | 5.4E-9** | 7.0E-9** | 3.4E-9 |
| State fixed effects included? | No | Yes | Yes |
| **Summary statistics** | | | |
| $R^2$ | 0.1863 | 0.3423 | 0.4373 |
| RMSE | 0.00148 | 0.00133 | 0.000768 |
| Number of observations | 43,378 | 43,378 | 1,701 |
| *Note*: Asterisks denote signifigance at the 5 percent (*) and 1 percent (**) levels. | | | |

In this model we assume that the out-migration rate across state pairs is a linear function of state housing prices, state unemployment rates, average marginal tax rates, population, geographic distance, the destination state's foreclosure rate, and the interaction between average marginal tax rate and distance. The origin ($\alpha_1$) and destination ($\alpha_2$) state fixed effects capture time-invariant state characteristics that are not captured by the other variables. We choose to use a linear model, because linear regressions have easy-to-interpret coefficients; we can unambiguously estimate the change in out-migration when a regressor is altered.

Regression results using the population out-migration ratio (Eq. 1) are presented in Table 1; regression results using the income out-migration ratio (Eq. 2) are presented in Table 2 (next page). In our regressions, we find most explanatory variables to be very significant and to have plausible signs: People eschew migrating to states with higher housing prices, tax rates, and unemployment rates than where they are living. They tend to move from less-populated states to more-populated ones, try to avoid moving to places with high foreclosure rates, and find nearby states to be more attractive destinations.

We find evidence of a statistically significant tax flight effect. The model estimates suggest that there is greater out-migration when the originating state's average income tax rate is higher than the destination state's average tax rate. Also, the tax-distance interaction term suggests that differences in state tax rates matter less (in terms of migration) when the states are farther apart. That makes intuitive sense. Washington state levies no income tax, but every year a few people will likely move to Washington from an East Coast state such as New Jersey for that reason. Our findings suggest that people are most sensitive to income tax rates of nearby states, so, for example, there would be a stronger effect on New Jersey migration if New York were to change its income tax rates.

## Analysis

In Table 3 (p. 621), we estimate how annual New Jersey migration would differ in three hypothetical scenarios: If New Jersey income tax rates rose by 1 percentage point across the board (scenario 1), if housing prices were $10,000 higher (scenario 2), and if the state's weighted average marginal tax rate had been fixed at its 2003 level (scenario 3). We use New Jersey as our test case. However, our regressions are based on domestic migration flows for the entire nation, and so we can perform similar calculations for any state or the district.

In Scenario 1, we estimate the change in annual migration if New Jersey were to raise state income tax rates in all tax brackets by 1 percentage point. We chose a 1 percentage point increase for elucidation purposes only, because it is equal to a 1 percentage point increase in the state's weighted average marginal tax rate. Based on internal New Jersey treasury calculations, we estimate that a 1 percentage point across-the-board increase in tax rates would be a very large tax increase, raising roughly $2.5 billion a year in additional revenue.

We estimate that starting in the year following a 1 percentage point tax increase, New Jersey would see increased annual net outflows of roughly 4,000 to

| Table 2. | | | |
|---|---|---|---|
| | Out-Migration Ratio (Income) | | |
| | (1) | (2) | (3) |
| | National — No State Fixed Effects | National — With State Fixed Effects | NJ Only — No Fixed Effects |
| Housing price | -3.8E-7** | -4.3E-7** | -1.8E-6** |
| Unemployment rate | -3.9E-5** | -1.4E-5* | -5.2E-5** |
| Distance | -6.9E-7** | -1.1E-6** | -6.1E-7** |
| Distance$^2$ | 8.4E-11** | 1.0E-10** | 7.0E-11* |
| State population | 8.2E-8** | 4.1E-8** | 1.2E-7** |
| Foreclosure rate | -4.5E-5** | -4.6E-5** | -4.9E-5* |
| Average marginal tax rate | -3.6E-5** | -3.8E-5** | -3.3E-5* |
| MTR * distance (interaction) | 7.3E-9** | 1.1E-8** | 5.7E-9 |
| State fixed effects included? | No | Yes | Yes |
| **Summary statistics** | | | |
| $R^2$ | 0.2021 | 0.3499 | 0.4336 |
| RMSE | 0.00123 | 0.00111 | 0.000747 |
| Number of observations | 43,378 | 43,378 | 1,701 |
| *Note*: Asterisks denote signifigance at the 5 percent (*) and 1 percent (**) levels. | | | |

6,000 taxpayers and $480 million to $540 million of adjusted gross income, depending on which regression is used. Assuming that the state receives 5 percent of AGI as income tax revenue, New Jersey would lose between $24 million and $27 million of annual revenue as a result of increased net out-migration. By dividing the estimated total lost AGI by the number of lost taxpayers, we calculate that the state would lose between $78,000 and $137,000 in annual income per lost taxpayer. (In comparison, New Jersey's median household income in 2009 was $68,000.) This suggests that income tax increases are associated with increased out-migration (or lessened immigration) of comparative high-income households.[7] The revenue gain from the tax increase would be partially offset and eroded over time by losses from out-migration. In alternative regressions, not included here, we find little evidence of any counteracting positive in-migration in the two to three years after a changed tax differential. In other words, the increase in annual tax-induced out-migration appears to persist so long as the increased differential in rates between one state and others is maintained.

In Scenario 2, we consider the effects of a $10,000 increase in median New Jersey home prices on migration. The median New Jersey home sales price in 2009 was $288,000. In the regressions using national migration data, we find that the increase in housing prices would be associated with a modest increase in out-migration. On net, the state would lose roughly 1,300 taxpayers and $70 million to $85 million in AGI. The regression based solely on New Jersey data predicts a much stronger migration response, suggesting that New Jersey residents are particularly sensitive to changes in housing prices. In any case, our findings indicate that there is a positive relationship between higher home prices and higher out-migration.

In Scenario 3, we estimate how New Jersey's population and AGI would differ if the state's weighted average marginal tax rate remained fixed at its 2003 level.[8] This exercise assumes that the 2004 tax increase had not taken effect and that bracket creep was offset. We estimate the cumulative effect of New Jersey tax changes on migration from 2004 through 2010: If average marginal tax rates had remained at 4.56 percent, we predict that New Jersey would have had roughly 18,000 to 28,000 more taxpayers in 2010. Also, AGI would have been $2.2 billion to $2.4 billion higher, generating $108 million to $119 million in additional annual tax revenue. The annual revenue gain from the 2004 tax increase has been about $1 billion,

[7]As mentioned above, the IRS dataset may not fully capture the migration of the wealthiest, who often file taxes late in the filing year. Therefore, we are possibly understating the AGI loss and the average income of taxpayers who leave.

[8]In our model, we assume that state tax effects on migration lagged by one year: For example, migration in 2004 responds to 2003 average marginal tax rates. That allows us to estimate migration changes through 2010 (using 2009 average marginal tax rates).

**Table 3.**

SCENARIO 1: +1 percentage point in average marginal tax rate

| | National — No state fixed effects | National — State fixed effects | NJ Only — No state fixed effects |
|---|---|---|---|
| Net change in taxpayers | 4,073 | 6,085 | 3,928 |
| Net change in income | $525,760,580 | $476,510,018 | $537,766,563 |
| Avg. income per taxpayer | $129,084 | $78,309 | $136,906 |

SCENARIO 2: +$10,000 in average housing price

| | National — No state fixed effects | National — State fixed effects | NJ Only — No state fixed effects |
|---|---|---|---|
| Net change in taxpayers | 1,312 | 1,340 | 5,862 |
| Net change in income | $73,848,266 | $83,565,143 | $349,807,576 |
| Avg. income per taxpayer | $56,287 | $62,362 | $59,674 |

SCENARIO 3: 2004 and 2009 New Jersey millionaire taxes

| | | | | National model (no fixed effects): Net change in migration | | National model (fixed effects): Net change in migration | | New Jersey only model: Net change in migration | |
|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Avg. MTR (lagged 1 yr.)** | **Avg. MTR (2003)** | **Avg. MTR diff.** | **Tax-payers** | **Income** | **Tax-payers** | **Income** | **Tax-payers** | **Income** |
| 2004 | 4.56 | 4.56 | — | — | — | — | — | — | — |
| 2005 | 4.95 | 4.56 | 0.39 | 1,588 | $205,046,626 | 2,373 | $185,838,907 | 1,532 | $197,170,127 |
| 2006 | 5.14 | 4.56 | 0.58 | 2,362 | $304,941,137 | 3,530 | $276,375,811 | 2,279 | $293,227,369 |
| 2007 | 5.3 | 4.56 | 0.74 | 3,014 | $389,062,829 | 4,503 | $352,617,413 | 2,907 | $374,117,678 |
| 2008 | 5.43 | 4.56 | 0.87 | 3,543 | $457,411,705 | 5,295 | $414,563,716 | 3,418 | $439,841,053 |
| 2009 | 5.44 | 4.56 | 0.88 | 3,584 | $462,669,311 | 5,355 | $419,328,816 | 3,457 | $444,896,698 |
| 2010 | 5.64 | 4.56 | 1.08 | 4,398 | $567,821,427 | 6,573 | $514,630,820 | 4,243 | $546,009,584 |
| **Totals** | | | | **18,490** | **$2,386,953,034** | **27,629** | **$2,163,355,482** | **17,837** | **$2,295,262,509** |
| | **Average income per taxpayer** | | | | **$129,096** | | **$78,300** | | **$128,680** |

*Notes*: Net change in taxpayers is calculated using Table 1 regressions. Net change in income is calculated using Table 2 regressions. Average income per taxpayer is calculated by dividing net change in taxpayers by net change in income.

which is still substantially higher than these revenue loss estimates. Nonetheless, by 2010 an appreciable portion of the post-2003 increases in taxes had been apparently offset by induced out-migration.

## Conclusion

This report analyzes the effects of state marginal tax rates on domestic migration in the United States between 1992 and 2009. Using IRS migration data and NBER state tax data, we calculated annual migration flows of taxpayers and income for every state pair. We find that average marginal tax rates have a small but significant effect on migration in the United States, specifically in New Jersey. Consistent with tax flight theory and findings from earlier migration studies, we find that an increase in a state's average income tax rate will increase out-migration from that state, holding all else equal. We estimate that higher New Jersey income taxes after 2003 were by 2010 associated with a net loss of approximately 18,000 to 28,000 taxpayers and $2.2 billion to $2.4 billion of annual income.

In conclusion, we find that migration after the New Jersey 2004 millionaire tax is associated with a non-trivial loss of tax revenue. In our calculations, we do not find evidence that income tax losses from migration would eclipse the immediate revenue gain from an across-the-board income tax increase in a short time period.[9] However, revenue losses from

[9]As noted, in our exercise we assume that a 1 percent increase in the weighted average marginal tax is a 1 percentage point across-the-board increase in tax rates, which raises revenue substantially. There could be alternative means of

**(Footnote continued on next page.)**

migration could also be significantly larger than what we predict here, since losses from other tax revenue streams (for example, sales, corporate, and property tax) should magnify the total fiscal cost of out-migration.

In our analysis, we make some assumptions. When we estimate tax losses for New Jersey, we assume all other states keep their tax rates constant; in the real world, of course, that would be extremely unlikely. Other states raising their tax rates simultaneously would attenuate the tax flight response. We also do not claim that taxes are the only element in migration decisions. Notably, net out-migration from New Jersey has ebbed in recent years. It is likely that recent weakness in the labor and housing markets has reduced American mobility and helps explain the observed drop in New Jersey flows. Results from a recent study by United Van Lines in 2011 seem to confirm that interstate migration levels have indeed dropped nationwide, although the direction of state-to-state migration flows appears to be largely unchanged.[10]

Conceivably, detailed analysis could reveal that the relationship we identify is not causal. Independent forces could simultaneously spur out-migration from a state and impose sufficient fiscal stress to trigger tax hikes. However, we do control for state fixed effects and unemployment rates, suggesting that those independent forces must be found elsewhere. Moreover, our findings would still suggest that a widened state tax differential is associated with potential stress on a state's economy, as indicated by increased out-migration. The bottom line is that our results appear to indicate a meaningful association between state income taxes and domestic migration.

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boosting the marginal rate by 1 percentage point, which would, according to our models, have equivalent migration effects but raise less immediate revenue. Indeed, we have found that substituting a state's top marginal income tax rate for the weighted average marginal rate produced similar tax migration effects. In New Jersey, a 1 percentage point rise in the state's top marginal rate would generate roughly $300 million in revenue; clearly, in this instance our estimated migration effects would offset a large share of the immediate revenue gain over a relatively short period. It must be noted that in this instance the migration effects would be associated with substantial movements of people not directly affected by the tax increase. Relocations of those taxpayers would presumably arise from concerns that a tax increase at the top could be associated with future tax increases in lower brackets, or that movements of top taxpayers from a state include shifts of business associates or employers.

[10]United Van Lines, 2012, "Northeast Exceeds Great Lakes Region to Lead the Nation in Outbound Migration," *available at* http://www.unitedvanlines.com/united-newsroom/press-releases/2012/documents/2011-migration.pdf.