

The Tax Flight Myth

People move for jobs, housing, family – not taxes

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Reducing state income taxes will have no discernible impact on whether people move into or out of Ohio. An overwhelming body of serious economic research shows that people are far more likely to move between states because of job prospects, housing costs, family considerations and weather than because of tax levels. This new study provides additional information showing that taxes do not affect interstate moves in the Ohio region.

Ohio Gov. John Kasich's fiscal year 2014-15 budget proposes a 20 percent reduction in income tax rates over a three-year period and a tax cut for certain business income. The plan reduces revenue in the state budget and broadens the sales tax, which falls more heavily on low- and middle-income families. Taken together, these changes on average would slash taxes for Ohio's wealthiest by more than \$10,000 each and slightly increase taxes for middle-income and poor households.²

In proposing this income tax reduction, the Kasich administration cited one rationale as reducing outmigration of households, referring to study findings that personal income taxes "encourage outmigration from a state."³ Gov. Kasich himself said that he was lowering taxes in part because, "We've had too many businesses, too many people that

Key findings

Do states that lower their income taxes attract or retain more people?

No

What would be the net result of the plan to reduce taxes and state revenue?

More people would leave

Why do people move?

**Jobs, affordable housing,
good pay, family**

Do taxes matter?

Too little to be measured

Will reducing Ohio's income tax keep people in Ohio?

No

¹ Jeffrey Thompson and David Rothstein contributed data analysis and data to this report.

² See <http://www.policymattersohio.org/tax-policy-feb2013>, which finds, in part, "The proposal would provide a \$10,369 annual tax cut on average to taxpayers in the top 1 percent of the income spectrum, who made more than \$335,000 in 2012. The bottom fifth of taxpayers, making less than \$18,000 a year, would see an average increase of \$63. Those in the middle fifth, making between \$33,000 and \$51,000 in 2012, would come out about even, averaging an annual tax increase of \$8." Broadening the base of the sales tax is good policy but steps must be taken to protect low-income Ohioans if that goes ahead. One such step is a state Earned Income Tax Credit. See <http://www.policymattersohio.org/eitc-mar2013>

³ State of Ohio Executive Budget, Fiscal Years 2014-2015, Governor John R. Kasich, Office of Budget and Management, p. 38, http://jobsbudget.ohio.gov/budget/Reforms_14-15.pdf.

have left this state and taken their wallets with them.”⁴ This line of reasoning is not unique to the Kasich administration.

Proponents of lower taxes often argue that higher income taxes encourage large numbers of people to leave or avoid a state, and that low taxes attract residents. Some have even gone so far as to claim that raising taxes will force enough flight that the state will actually see a revenue reduction. In fact, however, as a February story in the *New York Times* said, “It turns out that a large majority of people move for far more compelling reasons, like jobs, the cost of housing, family ties or a warmer climate. At least three recent academic studies have demonstrated that the number of people who move for tax reasons is negligible, even among the wealthy.”⁵ One author quoted in the story, Jon Shure, added, “I can flatly say that no state has ever raised taxes and lost money.”

This paper examines these issues for the Ohio area. The first section reports on a new in-depth analysis completed for Policy Matters Ohio by the Political Economy Research Institute at the University of Massachusetts-Amherst. This analysis looks at the relationship between taxes and migration for Ohio and neighboring states, controlling for a variety of variables, and examines how taxes compare to other factors in encouraging interstate moves. The rest of the paper reports on the frequency of interstate moves, examines demographic characteristics of those who move between states, considers where Ohio residents move from and to, and examines motivations for moving between states.

Our research found that unemployment has the largest impact on interstate migration in the Ohio region. When employment rises, in-migration rises in states in this region. By contrast, migration rises and falls with no clear pattern related to income tax levels, sometimes going down when taxes go down and sometimes doing the opposite.

We found that even a large across-the-board tax increase, far exceeding the magnitude of the proposed cuts, would not have a statistically significant effect on moves in the Ohio region. By contrast, similarly sized changes in unemployment insurance claims, housing affordability, or property crime have statistically significant effects on migration patterns.

These findings support what other studies have concluded. Previous research by Policy Matters found no relationship between changes in state income tax rates and migration patterns in the 1990s.⁶ An exhaustive review by the Center on Budget and Policy Priorities, a policy research institute, concluded that interstate moves are rare, that most people who move between states do so to find lower-cost housing or because of job opportunities, that income tax increases cause little or no interstate migration, and that increasing income taxes gives states a significant net increase in revenue to support schools, universities, local government, health care, environmental protection and human

⁴ As heard on Ohio Public Radio, 2/8/12, <http://tinyurl.com/audwk8a>.

⁵ Stewart, James, “The Myth of the Rich who Flee for Taxes,” *New York Times*, 2/15/13, <http://tinyurl.com/a3xm9tz>.

⁶ <http://www.policymattersohio.org/income-taxes-and-ohio-migration-a-link-that-doesnt-exist>.

services – investments that in the long run help create jobs and build a strong economy.⁷ This new regression analysis for Ohio finds similarly that housing and employment cause people to move. Taxes, in contrast, do not.

Ohio study

Much academic research finds that tax rates do not significantly affect interstate moves.⁸ Policy Matters contracted with the Political Economy Research Institute at University of Massachusetts-Amherst to explore this issue for Ohio and surrounding states. We measured migration patterns from 1988 to 2008, the most recent 20-year period for which complete data are available. We did the analysis for all states and for an Ohio region that included Ohio, all adjoining states and Illinois (Ohio, Indiana, Illinois, Michigan, Pennsylvania, West Virginia and Kentucky). The equation, all variables, and in-depth results are described in the appendix and described in less technical terms here.

We use Internal Revenue Service data that tracks households claiming different states as primary residence from one year to the next to examine how fluctuations in 16 variables – including crime rates, housing prices, unemployment insurance claims, and state income taxes – corresponded with fluctuations in migration between each of our seven focus states and each other continental state plus Washington, D.C. Alaska and Hawaii were excluded from the analysis because of geographic isolation.⁹

For each variable, we considered a change of one standard deviation, a typical measure used by statisticians that illustrates how far something is likely to vary from the middle. For some variables, as for taxes, policy makers are unlikely to change taxes by a standard deviation. Even so, we did not get a statistically significant change in migration patterns for a one standard deviation change in tax rates. A comparable change in other variables, by contrast, yielded statistically significant and sometimes large results.

Results: what matters?

Employment matters

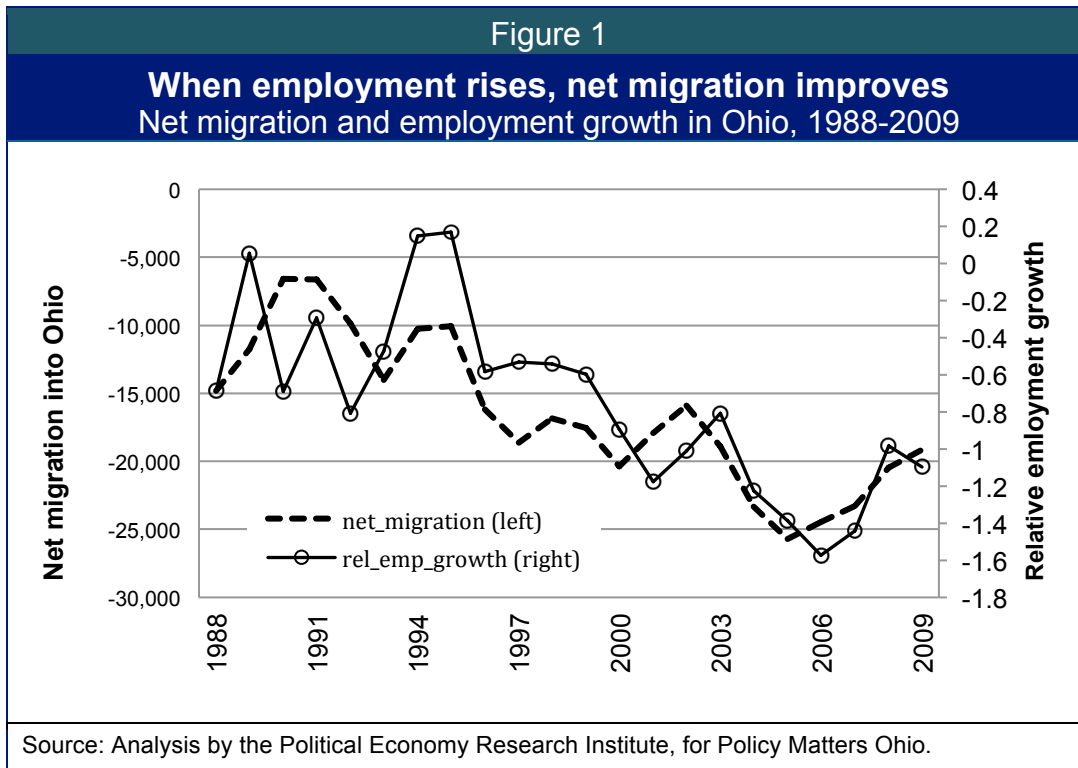
We found that for Ohio, employment and unemployment have the largest impact on interstate migration. Figure 1 depicts the fairly straightforward relationship – when employment in Ohio rises, net migration to Ohio rises.¹⁰

⁷ Tannenwald, Robert, Jon Shure and Nicholas Johnson, “Tax Flight is a Myth: Higher State Taxes Bring More Revenue, Not More Migration,” Center on Budget and Policy Priorities, August 4, 2011 at <http://www.cbpp.org/cms/index.cfm?fa=view&id=3556>

⁸ See the CBPP paper <http://www.cbpp.org/cms/index.cfm?fa=view&id=3556> for a summary.

⁹ Other variables in the model included per-capita income, housing affordability, employment growth, insured unemployment rate initial claims, insured unemployment rate continuing claims, K-12 per capita spending, higher education enrollment, violent crime rate, property crime rates, and age variables. We also controlled for distance between the largest cities in the states and the U.S. unemployment rate in the period, as is standard in such models. See the Appendix for a list of the variables.

¹⁰ Relative employment growth is the state’s employment growth rate (employment in year one minus employment in year zero, divided by employment in year zero) less the employment growth of the entire country. Net migration is calculated from IRS state-to-state migration data.



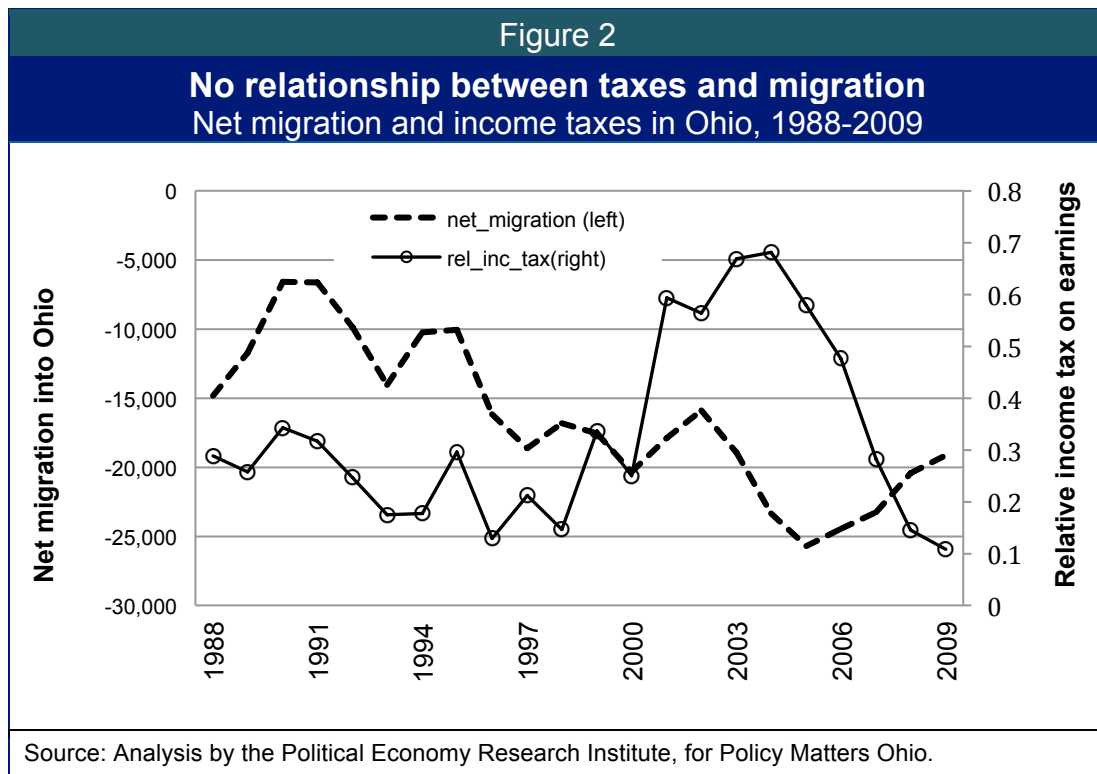
Taxes do not cause migration

Income taxes had no discernable relationship to migration; in fact there are times when the number of people leaving the state drops as taxes go down and vice versa.

Figure 2 shows this lack of relationship – taxes and migration have sometimes moved in the same direction but sometimes moved in opposite directions over recent decades.¹¹ This is very different from the employment chart above, where the relationship is clear and in the same direction.¹²

¹¹ The relative income tax rate is the average marginal tax rate in the state minus the national average, calculated by the National Bureau of Economic Research using the TAXSIM program.

¹² For this chart, the indicators would be moving in opposite directions if the taxes were driving out-migration in any meaningful sense. If higher income taxes consistently made people leave or not come to Ohio, the dashed line would go up when the solid line went down. This indeed happened between 2005 and 2009 but for the entire period between 1988 and 2005 the lines moved either in the same direction or in inconsistent ways.



Gov. Kasich's budget proposal for the 2014-2015 fiscal years would reduce the state income tax by 20 percent over three years.¹³ Policy Matters and others have recommended keeping the current income tax rate for those earning less than \$250,000, restoring the previous 7.5 percent rate on income over \$250,000, and adding an 8.5 percent bracket for income over \$500,000. We examined the effect on net migration of raising the average marginal income tax rates paid by residents in the Ohio region by one standard deviation. One standard deviation of this tax rate over the period studied is 1.9 percentage points, and would be a large across-the-board tax increase, far exceeding the scope of changes being discussed by those who want to raise or lower taxes.¹⁴ The average tax in Ohio is 3.4 percent, so this would increase state income taxes on average by well over 50 percent – and because Ohio has a graduated tax, the increase for most taxpayers would be more than that. A 1.9 percentage-point increase also would be nearly twice as large as the reduction being proposed.¹⁵ We found that even an increase this

¹³ It also would exclude from the tax half of business income from partnerships, S Corporations and other passthrough entities up to a maximum of \$750,000 a year.

¹⁴ The Kasich administration proposal would lower income taxes by less for many Ohioans than they would pay in additional sales taxes. Even for those in the top bracket, those earning more than \$208,500, constituting less than 5 percent of Ohioans, the reduction would be below the 1.9 percentage point reduction modeled here for all taxpayers.

¹⁵ American households pay a low percentage of their income in state income taxes though it varies from state to state. Ohio income tax rates now range from .59 percent for taxable income below \$5,000 to 5.925 percent for taxable income over \$208,500. As low as those rates are, what people pay, after deductions and credits, works out to much less, ranging from .3 percent of income on average for the poorest fifth of families to 4.4 percent of income on average for the top 1 percent, according to analysis by the Institute on Taxation and Economic Policy. This is because people only pay higher rates on income over the level that falls in higher brackets, and they pay the lower rate on income up to the bracket. On average, after credits, Ohio residents paid 3.4 percent of their income in state income taxes, according to e-mail correspondence

extreme would not result in people leaving Ohio. There was no statistically significant net migration effect from this change. The result was the same for the nation as a whole.

Some past studies and our own analysis found a tiny but sometimes statistically significant effect if we look at the impact in the origin and the destination states separately, instead of only looking at net differences between the origin and destination states. Interestingly, we and others¹⁶ found both a small increase in retention of people, and a small decrease in in-migration when states raised their income taxes by one standard deviation.¹⁷ Because these trends are in opposite directions, however, when considering net migration, as we did, the change is not statistically significant.

Many variables do cause interstate moves

Table 1 gives migration results for unemployment, employment, property crime and housing affordability (defined as median household income divided by median home price), as well as for taxes, for Ohio.

In Ohio, a 0.9 percentage point increase, from 2.1 percent to 3 percent, in the rate of continuing unemployment compensation insurance claims (one standard deviation) results in more than 10,000 people either leaving or not coming to Ohio.¹⁸ The finding was statistically significant to a 99 percent degree of confidence. A one standard deviation increase in property crime would result in more than 5,000 people leaving or not coming to Ohio, also statistically significant. A standard deviation increase in Ohio's housing affordability compared to other states would have meant more than 2,000 people coming to or not leaving Ohio. And a standard deviation increase in employment would have meant that nearly 1,000 people came to or stayed in Ohio when they otherwise would have left, also statistically significant.

By contrast, a comparable change in either the marginal income tax rate or the capital gains tax rate would not have resulted in a statistically significant change in net migration in Ohio. The point is not to focus too deeply on the exact numbers, as other states have found larger or smaller effects from changes in unemployment, crime or housing affordability. The important finding is that many factors that are affected by policy change do in fact result in migration, often in numbers that matter. Income taxes, however, are not one of them. Table 1 explains the results in simple terms; the appendix presents several more technical tables.

between Policy Matters Ohio research director Zach Schiller and Gary Gudmundson of the Ohio state tax department. Families pay more in other state and local taxes such as property and sales tax.

¹⁶ http://www.peri.umass.edu/fileadmin/pdf/published_study/Migration_PERI_April13.pdf.

¹⁷ A large increase in taxes both causes fewer people to come to a state and also, somewhat paradoxically, causes fewer people to leave, although both results are quite small. This may be because increasing taxes improves the quality of education, amenities or services, thereby making residents more likely to remain in a state, or it may be because increasing taxes leads to retention of public sector workers, reducing their out-migration, but we can't say for sure that those are the causes. In any event, when considering net migration, we found no statistically significant effect.

¹⁸ The increase used in the Ohio regression was from a statewide rate of 2.1 percent of Ohioans to 3.0 percent filing "continuing unemployment compensation claims".

Table 1	
What happens when you change inputs by the same relative amount? Migration impacts from a one-standard-deviation change	
When unemployment claims rise one standard unit	10,211 people leave or don't come to Ohio
When property crime rises one standard unit	5,047 people leave or don't come to Ohio
When employment rises one standard unit	924 people come to or don't leave Ohio
When housing affordability rises one standard unit	2,025 people come to or don't leave Ohio
Tax variables	
When the share of state GDP coming from the state's own sources (as opposed to the federal government) rises one standard unit	3,131 people leave or don't come to Ohio
When the capital gains tax rate rises one standard unit	There is no measurable change in state population
When income taxes rise one standard unit	There is no measurable change in state population
Source: Political Economy Research Institute analysis for Policy Matters Ohio.	

The discussion so far and all of the numbers we've presented consider the impact of raising taxes while holding other conditions constant. The income tax changes described above assume that no other factors, including revenue, change. In practice, tax increases bring in more revenue and tax cuts reduce revenue. Reduced revenue means less money for public spending, which in turn means both layoffs and quality of life declines for communities as parks, schools, libraries, safety services and other public goods are cut.

According to Gov. Kasich's budget proposal, Ohio will receive \$487 million less in revenue in fiscal year 2016 as a result of proposed tax changes (reduced income and business taxes and increased sales and severance taxes).¹⁹ This equates to a one percentage-point decrease. If Ohio reduces income taxes by one percentage point – in the spirit of Gov. Kasich's proposal – it would cause a very small but statistically significant net out-migration.²⁰ But that is only part of the story. Depending on what spending cuts the state makes, the outcome could be worse. If the public sector reduces employment or avoids hiring that it otherwise would have done, more people would leave Ohio. If the

¹⁹ Ohio's Jobs Budget 2.0, The State of Ohio Executive Budget Fiscal Years 2014-2015, Reforms Book, Appendix E.

²⁰ Ohio's GDP was \$484 billion in 2011. The \$487 million revenue reduction is equivalent to 0.1 percent of GDP. Ohio's average marginal tax rate on wage income is 5.0 percent; a 20 percent reduction in average MTR is equivalent to a 1-point decrease. For the calculations in these two paragraphs we simply divide 1 by 1.9 (the change that we modeled for the larger analysis) and multiply that by changes described in our analysis and detailed in the appendix.

\$487 million in cutbacks results in a loss of 7,300 jobs,²¹ it would cause nearly 1,200 people to leave or not come to Ohio on net.²²

If jobs were lost in law enforcement or other sectors that could lead to higher property crime, then the impacts on migration could be even greater, further increasing net out-migration. This paper does not consider all of the possible ways states spend or invest revenue. But if revenue from increased taxes is used to create jobs, reduce unemployment or reduce property crime, states can end up growing in population. The next section considers other research on migration, separate from our statistical analysis.

Who moves and how much?

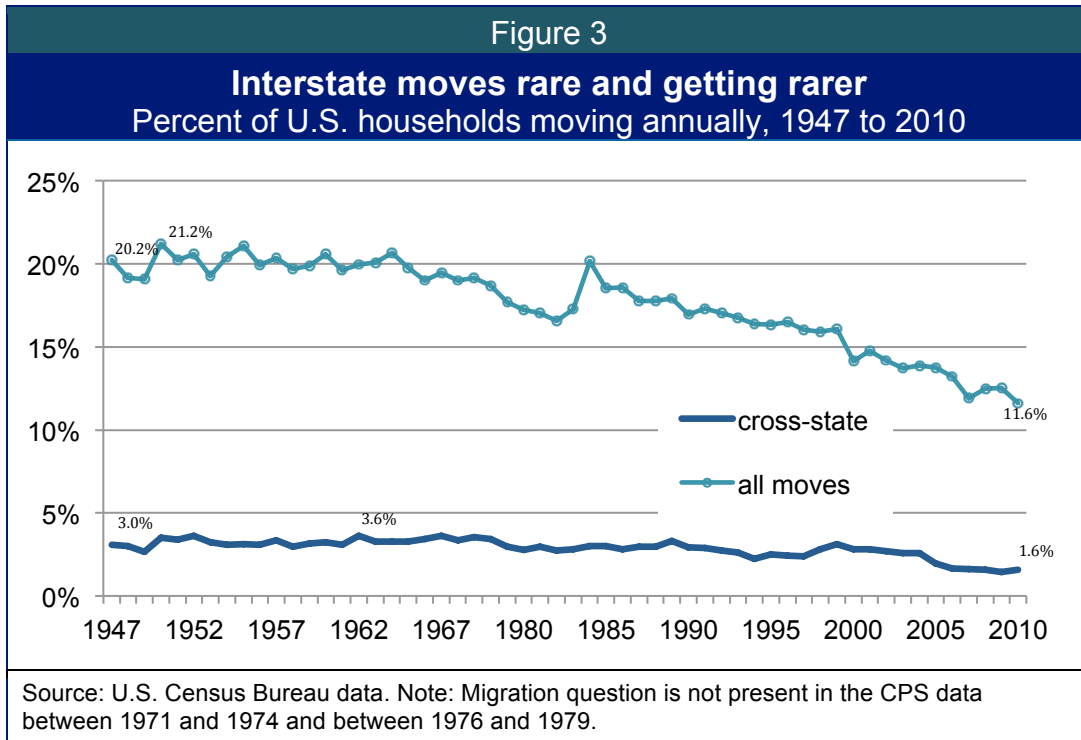
Americans move less than they used to. About 20 percent of American households changed residences each year from the 1940s to the 1960s. This has declined at a pretty constant rate since 1963; by 2010 only about 11 to 12 percent of Americans were moving each year.²³ Cross-state moves are even less common, peaking at 3.6 percent of households in 1962 and falling to a low of 1.4 percent in 2009. This percentage rose slightly to just 1.6 percent of households by 2010 as Figure 3 shows.²⁴ The most recent census data, released just last week and not included in this chart for data compatibility reasons, indicates that as we emerge from the recession, interstate migration is increasing slightly.

²¹ The 7,300 jobs figure assumes \$60,000 in total annual costs per hire and 10 percent administration costs for the entire \$487 million.

²² The state's current (February 23, 2013) IUR for continuing claims would fall from 2.45 to 2.60 if the number of continuing claims rose by 7,300 and total covered employment fell by an equivalent amount

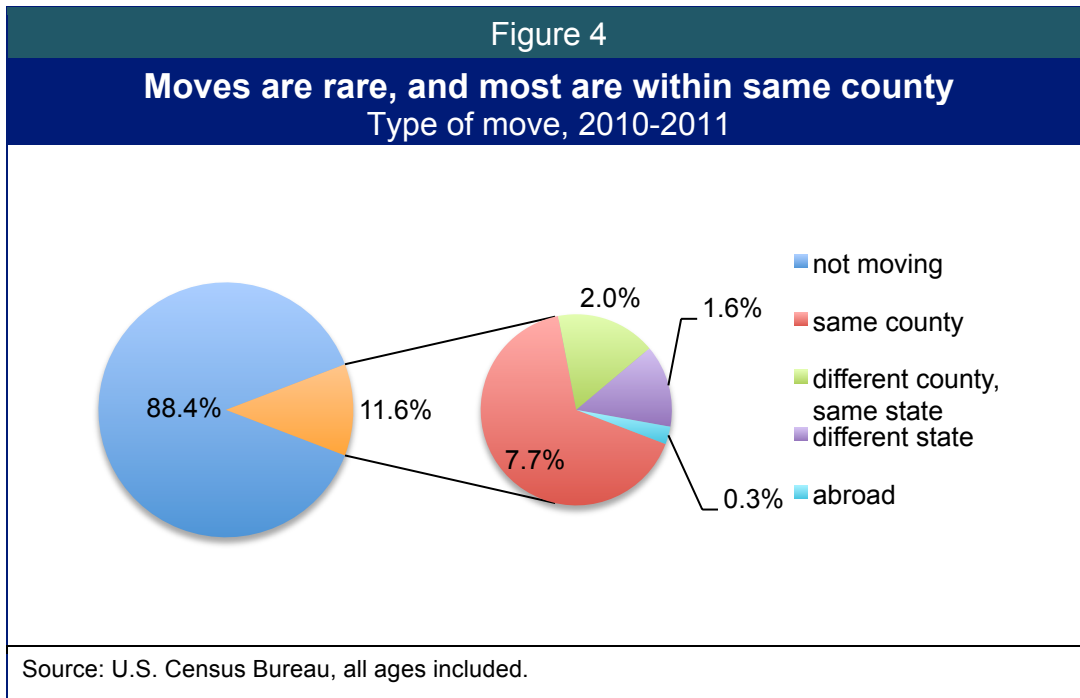
²³ Thompson, Jeffrey, "The Impact of Taxes on Migration in New England", Political Economy Research Institute, 2011, <http://tinyurl.com/ba65ewd>

²⁴ U.S. Census Bureau, State-to-State Migration Flows, available at www.census.gov/hhes/migration/data/acs/state-to-state.html; see also, Mitchell, Josh, "Americans Get Moving Among Torpid Recovery," *The Wall Street Journal*, January 9, 2013. 2011 rates were slightly higher than 2010 rates but the 2011 data source differed slightly from the historical trend so we did not include it on this trend chart.



As Figure 4 shows, more than 88 percent of households did not change residences in 2010, 7.7 percent moved within the same county, 2 percent moved to a new county within the same state and only 1.6 percent moved to a different state for any reason.²⁵

²⁵ These figures refer to households, not individuals, because tax returns provide the best system for analyzing migration within the U.S. Americans in their early 20's move more frequently and are more likely to be single filers, so using household migration as a proxy for all migration may in fact overstate the percentage of Americans who are moving each year.

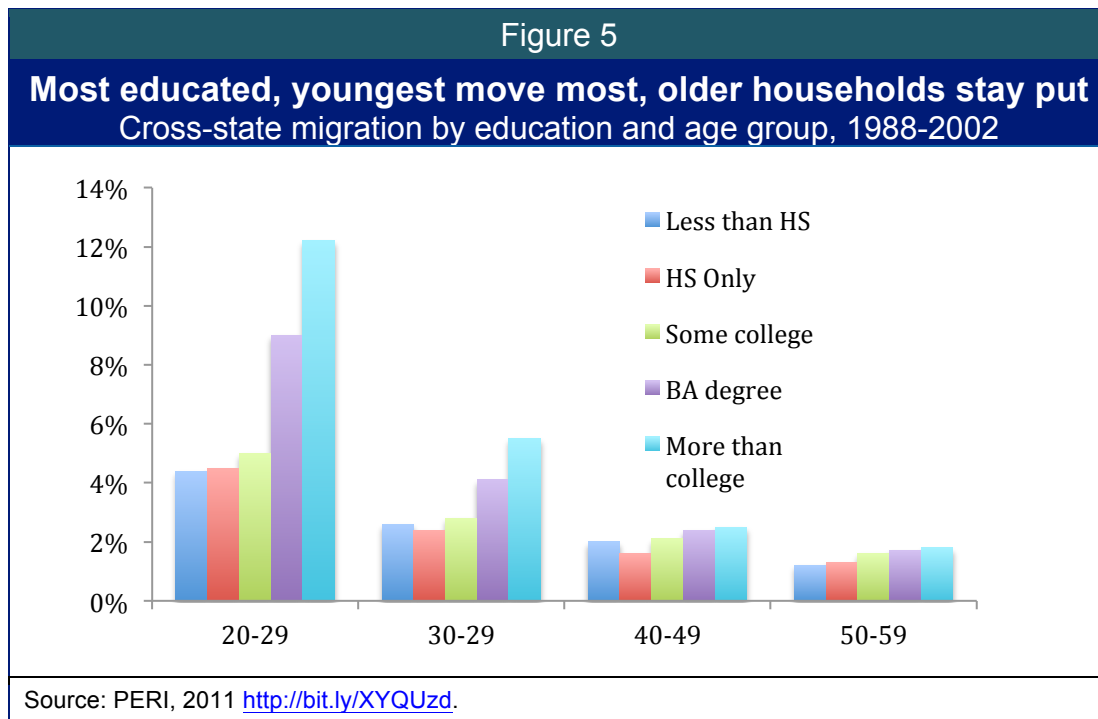


Young adults with less career experience are the most likely to move across state lines²⁶ because they are less likely to be married, have children, own homes, or have stable employment – all factors that reduce interstate migration.²⁷ Newly married couples often move once, to a location where both spouses can find jobs, but are less likely to move thereafter. Americans are especially unlikely to move if they have teenage children. Unemployed adults are more likely to move to another state, and those who own homes are less likely to do so. More highly educated workers move more often, but they are much more likely to move across state lines in their 20s and, to a lesser extent, in their 30s. By the time workers are in their 40s and 50s, they are far less likely to move across state lines, regardless of education, as Figure 5 shows.²⁸

²⁶ CBPP 2011

²⁷ Greenwood, 1997, cited on page 6 of <http://bit.ly/XYQUzd>.

²⁸ See Appendix Figure yy, and PERI, 2011, p. 44 (available at <http://bit.ly/XYQUzd>).



In sum, the people most likely to move are young adults who are still seeking permanent jobs, and the least likely are married parents of teenagers. Americans with the highest incomes do not regularly jump from state to state in search of low tax rates.²⁹ While some wealthy families obviously change states, most interstate movers are young and less established.

Where do movers go?

Americans are more likely to move to warmer climates, to move short distances, and to move where they have family ties. Employment opportunities and housing values are the most important economic variables influencing migration decisions. U.S. Census survey data from individuals who filed 2010 taxes in one county and 2011 taxes in another show that the four most prevalent reasons Americans between the ages of 30 and 64 cite for moving were job (36 percent), family (22 percent), housing (28 percent), and quality of life (8 percent). Together, about 93 percent of Americans who move cite these four variables.³⁰ Quality of life includes things like neighborhood safety, public schools, and parks. Aside from these, Americans cite college, retirement, and natural disasters more frequently than taxes. This does not mean taxes are totally irrelevant but taxes clearly take a distant back seat to many other motivators.

This is partly because the overall tax differences between most “low-tax” and “high-tax” states are relatively small – states with lower income taxes often have higher property or

²⁹ Americans who own a business and are strongly rooted to a certain community or professional network may be even less likely to move out of state.

³⁰ Census data as cited in the PERI report, <http://tinyurl.com/ba65ewd>.

sales taxes to make up the lost revenue. On average, Ohio taxpayers contributed 10.8 percent of their income to state and local taxes in 2010.³¹ Although this gives Ohio the rank of 18th highest for combined state and local taxes, it is virtually identical to the national average of 10.7 percent. Moving from Wisconsin, ranked 10th highest with average taxes at 11.7 percent of personal income, to 40th-ranked Texas where taxes average 9.5 percent of personal income, would have saved the that taxpayer only 2.2 percentage points of income. Differences in job quality or housing prices are much larger. For example, there was a 32.3 percent difference in 2011 median household income between Alabama, ranked 10th for income at \$42,590, and North Dakota, ranked 40th at \$56,361.³² The situation is similar with housing values: The average 2010 home price was \$264,471 in the 10th highest state (Virginia) and \$149,282 in the 40th highest state (West Virginia), a 77 percent difference, according to the Federal Housing Finance Agency,³³

Taxes pay for public services, so rather than being at an economic disadvantage a state with a higher tax rate might have better schools, universities, parks, libraries, safety services, child care or elderly care. These factors can improve quality of life, of course, and in the case of schools can improve career prospects. They can also improve a financial bottom line – better schools may enable a family to send a child to public rather than private school, subsidized elderly home care might save a family from having to put a grandparent in a nursing home, subsidized child care might be the factor that makes work viable for a low-income family. These services are often worth far more than what would be saved on taxes by living in a lower-tax community.

Ohio movers

Ohio's population more than doubled to 10.7 million people in 1970 from 4.2 million in 1900. Since then the pace of growth has slowed dramatically to between half a percent and 5 percent per decade. In 2010 the state had 11.5 million people. Although our population has grown each decade as a result of births, movement from other states and countries and longer life spans, other areas of the country are growing more rapidly and slightly more people have moved out of Ohio than into Ohio each year since 1980.³⁴ In 2010, 11 people moved out of Ohio for every 10 that moved in.³⁵ Our net population loss to other states was about 14,000 in 2011, just over one-tenth of 1 percent of the state's total population.³⁶

Further evidence that taxes are not a significant cause of state-to-state movement comes from the fact that the states to which Ohio loses the largest number of households are also the states from which it gains the largest number of households.

³¹ Federation of Tax Administrators, 2010 state and local revenues as a percent of personal income: <http://www.taxadmin.org/fta/rate/burden.html#slfinance>.

³² US Census median household income, single year estimates at <http://www.census.gov/hhes/www/income/data/statemedian/>.

³³ Download from Federal Housing Finance Agency at <http://www.fhfa.gov/Default.aspx?Page=87>.

³⁴ http://www.censuscope.org/us/rank_popl_growth.html.

³⁵ US Census Data, state-to-state migration flows.

³⁶ US Census data, 2011 state-to-state population flows.

This isn't surprising – people usually move to nearby states or large states, and people often return to a place with family ties. Climate also figures in: Texas, Florida and California are destination states for Ohioans and many people come to Ohio from those states. Those leaving Ohio are most likely to go to Florida, a state with no income tax, or Kentucky, a state with a higher top income tax rate than Ohio's, according to tax filer migration data from the Internal Revenue Service. As Table 3 shows, Ohio lost the largest number of households to Florida, Kentucky, Texas, Indiana, Pennsylvania, California and Michigan in 2011. Ohio gained the most population from the same seven states. As in previous years, more households came to Ohio from Florida than from any other state. While Florida and Texas do not have income taxes, all the others do, some with top rates that exceed Ohio's.

Table 2			
The seven most popular destinations for Ohio exiters are also the seven most popular senders to Ohio, 2011			
State	Migration out of Ohio	Migration into Ohio	Net
Florida	9,724	6,637	-3,087
Kentucky	6,214	4,869	-1,345
Texas	5,279	3,058	-2,221
Indiana	4,698	4,134	-564
Pennsylvania	4,660	4,175	-485
California	4,527	3,547	-980
Michigan	4,278	4,814	536

Source: Internal Revenue Service migration data, households.

Conclusion

In conclusion, reducing taxes will not attract or retain population. Few Americans move between states each year and those who do are motivated by jobs, housing prices or family ties. Most moves take place early in life before careers are firmly established.

Even large changes in income taxes do not lead to significant changes in migration. Housing affordability, unemployment, and property crime do. Cutting income taxes deprives the state of revenue needed to create a state economy with excellent schools, universities, worker training and infrastructure. These spending reductions themselves can cause net out-migration. If we want a prosperous state, we should start by determining what we need to provide to businesses, students, workers and families, and then put in place the tax structure that most fairly and sufficiently provides those public goods. An adequate income tax is a crucial part of that structure.

Technical appendix and data notes

We use IRS data on migration for the regression analysis and all figures and tables except Figures 3 and 4. The IRS measures in-state and out-of-state migration by identifying Social Security numbers for each year and matching them with filer location. The data, for privacy reasons, does not provide demographic data and may not include late tax filings or dependents who file separately. We use Census Bureau data for Figures 3 and 4. The Census uses IRS data as a starting point but also factors in births and deaths. It measures overall population change, not state-to-state flows. The American Community Survey and Current Population Survey provide demographic data and answer questions about why people move. More on the Census data can be found on the [Census Geographic Mobility/Migration page](#).

A standard approach to studying migration is to use a logistic model, which assumes households migrate after comparing attributes of origin and destination locations. Following Sasser, (2009)³⁷ this analysis uses Ordinary Least Squares regression, using IRS data to form state panels. An individual filing a return in state “o” (for origin) in year 1, and in state “d” (for destination) in year 2, is identified as having migrated from “o” to “d” between those years. Again following Sasser, we include state fixed effects to control for various factors. We use one-year lagged values, looking at how a change in conditions in the previous year affects migration in the current year.

The economic variables we use are described in the text of the paper and listed below. Other factors could have been included and of course no model can include everything. Weather and climate, known to be important, change little from year to year, which is why we did not include them in this analysis.

The dependent variable is the migration rate, calculated by dividing the number of migrants leaving a state for another, divided by the total number of residents in the origin state in the prior year. The migration rate can be written as follows:

$$\text{Migration}_{o,d,t} = \frac{\text{exemptions leaving state "o" for state "d" between year "t" and year "t+1"}}{\text{total exemptions in state "o" in year "t"}}$$

The number of migrants is calculated using the total number of exemptions claimed on federal income tax returns. Results are unchanged if we use the number of returns

The paper examines both how many leave a state and how many come to a state, which is an asymmetric approach, following Sasser, but for simplicity the text often emphasizes the net number.

The asymmetric specification can be written:

$$\text{Migration}_{o,d,t} = \alpha + \beta\chi_{o,t-1} + \gamma\chi_{d,t-1} + \theta Z_t + \rho D_{o,d} + \bar{O}_o + \bar{O}_d + \bar{O}_t + \varepsilon_{o,d,t}$$

³⁷ Sasser, Alicia, 2009. “Voting with their Feet? Local Economic Conditions and Migration Patterns in New England,” New England Public Policy Center, Working Paper 09-01.

In this equation β is the coefficient on lagged economic and fiscal variables in the origin state ($\chi_{o,t-1}$), γ is the coefficient on lagged conditions in the destination state ($\chi_{d,t-1}$) and \bar{O}_o , \bar{O}_d , and \bar{O}_t are fixed effects for the origin state, destination state, and year, respectively. Also included are national unemployment rate, which only varies over time (Z_t) and a measure for the distance between the largest cities in each state, which varies across each origin-destination pair ($D_{o,d}$). Following Sasser we use the natural log of the dependent variable as well as variables for real per-capita personal income and housing affordability. The net-difference specification is only different in how the independent variables are expressed:

$$\text{Migration}_{o,d,t} = \alpha + \beta \text{DIFF} \chi_{o,d,t-1} + \theta Z_t + \rho D_{o,d} + \bar{O}_o + \bar{O}_d + \bar{O}_t + \varepsilon_{o,d,t}$$

In this specification, each of the relative economic and fiscal variables ($\text{DIFF} \chi_{o,d,t-1}$) is expressed as the difference between conditions in the origin and destination state (origin less destination). We also weight the regression by total state population to adjust for the fact that smaller states have greater variability in migration rates.

The tables below present the full regression analysis on out-migration due to changes in variables for all states and for the Ohio region for 2008.³⁸

The first table shows results that were statistically significant for all states and the Ohio region. Three asterisks (***) indicates significance to a 99 percent confidence level, two asterisks (**) to a 95 percent confidence level, and one asterisk (*) to a 90 percent confidence level. No asterisk means that the relationship is not statistically significant. The initial row is the change and the row below is the standard error, in parenthesis. We can have more confidence saying that the variables with a higher confidence level actually do affect migration. The regression modeled effects on net out-migration, so a positive number means more people leave (or don't come to) the state, while a negative number means more people come to (or don't leave) the state. If we want more people to live in Ohio, a negative number is desirable.

We found that in all states and the Ohio region, out-migration was reduced (more people came to the state) when there was an increase in per capita income, higher education enrollment, housing affordability or employment growth. The housing and employment variables were less statistically significant in the Ohio region.

We found that net out-migration increased (more people left) when the following factors increased: property crime rate, the share of revenue that came from the state compared to that coming from the federal government, continuing unemployment compensation claims, and initial unemployment compensation claims. Own-state revenue and initial unemployment were less statistically significant in the Ohio region than in the nation as a whole.

³⁸ Results are based on data through 2008 because the K-12 education-spending variable was not available at the time when the regression was conducted. Results through 2009, dropping the education variable, are essentially identical.

Appendix Table 1		
Statistically significant effects on out-migration		
Factors that reduce net out-migration when they rise		
	All states	Ohio region
Per capita income	-0.39573***	-0.63232***
	(0.092)	(0.143)
Higher education enrollment	-0.33218***	-0.37949***
	(0.034)	(0.050)
Housing affordability index	-0.12791***	-0.06419*
	(0.024)	(0.036)
Employment growth	-0.00185***	-0.00165**
	(0.001)	(0.001)
Factors that increase net out-migration when they rise		
Property crime rate	0.17656***	0.12989***
	(0.028)	(0.043)
Own-state revenue as share of GDP	0.14960***	0.15249**
	(0.049)	(0.073)
Continuing unemployment claims	0.19110***	0.19473***
	(0.025)	(0.036)
Initial unemployment claims	0.03931*	-0.02282
	(0.024)	(0.033)
Observations	44,568	11,942
R-squared	0.837	0.906
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		
Source: Analysis by the Political Economy Research Institute, for Policy Matters Ohio.		

We found several factors that did not affect net migration in a statistically significant way. These included income tax rates, capital gains tax rates, sales tax rates, K-12 per capita spending or the rate of violent crime. In the case of K-12 spending and violent crime, one reason they might not have had an effect is that both measures vary much more within states than among states – all states have communities that spend more on schools or that have lower crime, so they may be factors that are more likely to affect decisions about where within a state to locate than about which state to choose.

Appendix Table 2		
Factors that do not have a statistically significant net effect on migration		
	All states	Ohio
Income tax rate	-0.04908 (0.180)	0.13139 (0.302)
Capital gains tax rate	0.00298 (0.055)	0.07488 (0.093)
Sales tax rate	-0.01639 (0.031)	-0.03883 (0.038)
K-12 per capita spending	0.03072 (0.034)	0.01954 (0.050)
Violent crime rate	0.01155 (0.022)	0.03836 (0.031)
Observations	44,568	11,942
R-squared	0.837	0.906
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		
Source: Analysis by the Political Economy Research Institute, for Policy Matters Ohio.		

We controlled for several variables, as is typical in such analyses. These controls included controls for age, shares of the population with a BA, hurricane Katrina, the distance between the largest cities in different states, and the US unemployment rate.

Appendix Table 3		
Control variables		
Control variables	All states	Ohio
Share age 25-34	0.03443 (0.056)	0.02008 (0.088)
Share age 65 and up	-0.14420 (0.089)	0.14243 (0.144)
Share with a BA among those 25 and up	0.06910 (0.106)	-0.14092 (0.158)
Hurricane Katrina	0.10876** (0.042)	0.07315 (0.078)
Distance between biggest cities	-0.00114*** (0.000)	-0.00216*** (0.000)
US unemployment rate	0.06573** (0.031)	0.02466 (0.043)
Constant	-8.01137*** (0.127)	-7.40896*** (0.326)
Observations	44,568	11,942
R-squared	0.837	0.906
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1		
Source: Analysis by the Political Economy Research Institute, for Policy Matters Ohio.		

The table below presents the numbers from the regressions above in terms that are more accessible to non-statisticians.

Appendix Table 4				
What happens when you change inputs by one standard deviation?				
Change in net out-migration from Ohio from a one standard deviation change in variables				
	Rises from:	Rises to:	Change to average state	Cumulative out-migration**
Unemployment -continuing claims	2.094	3.011	217.256	10,211
Property crime	38.723	49.447	107.373	5,046
OS Revenue as % of GDP	0.128	0.143	66.618	3,131
Employment growth	0.007	0.025	-19.666	-924
Housing Affordability Index	0.379	0.443	-43.075	-2,024
Capital Gains*	6.200	8.504	23.798	*NS*
Marginal income tax *	5.021	6.867	27.370	*NS*
Note: regressions use combined federal and state tax rate to incorporate cross deductibility of income taxes. Tax change is displayed showing only state tax. *Not statistically significant. **Negative number means more people come TO the state.				
Source: Analysis by the Political Economy Research Institute, for Policy Matters Ohio.				