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Taxation Without Borders: How Elite Embeddedness Trumps Millionaire Migration

Varner, Charles

Princeton, NJ : Princeton University

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TAXATION WITHOUT BORDERS:

HOW ELITE EMBEDDEDNESS TRUMPS MILLIONAIRE MIGRATION

Charles Edwin Varner, Jr.

A DISSERTATION

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OF PRINCETON UNIVERSITY

IN CANDIDACY FOR THE DEGREE

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Adviser: Douglas S. Massey

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Abstract

During a period of rising economic inequality, the United States pursued a regimen of fiscal reform, drastically cutting top federal income tax rates. In recent years, however, a bold experiment in fiscal policy has been happening in U.S. states. Starting with New Jersey in 2004, nine states and Washington, D.C., have added new tax brackets at the very top of the income distribution. These "millionaire taxes" have been seen as policy levers that can bridge budget gaps and reduce income inequality. Indeed, in 2010, Congress itself began to add taxes that are limited to the highest brackets.

But are the fiscal and redistributive results of state-level millionaire taxes sustainable? Higher taxes raise the implicit price of the social contract, and elites may be well positioned to exit to a lower-tax state. Given the potential for millionaire migration, economists have long concluded that progressive taxation cannot affect inequality at the state level.

However, the migration mechanism that is fundamental to this theoretical conclusion has never been established. Economic elites are a hard-to-reach population, and difficult to study using traditional survey methods. The present study overcomes this problem by utilizing a new data source on millionaires—state and federal tax records, which collectively cover the entire millionaire population of the United States.

The three substantive chapters find that responsiveness of elite migrants to state income taxes is low. Contrary to conventional wisdom in both academic and policy circles, progressive taxation at the state level is possible, even with open borders between states. Tax flight is rare, and the evidence indicates that elite migration is constrained by

social processes that embed elites in particular communities. This finding stands in stark contrast to the oft-conjured image of the jet-setting millionaire. The importance of place for elites, as for the general population, must not be underestimated. Place is constitutive of social and cultural capital. Indeed it is by virtue of such elite embeddedness that U.S. states (and European Union nations) can have progressive taxes. Regional redistribution regimes are possible in an era of increasing political polarization and rising geopolitical connectedness.

Acknowledgements

On January 17, 2008, Blanche E. Anderson, Graduate Program Administrator in the Department of Sociology, forwarded an email to socgrads@Princeton.EDU. This email contained an answer to a prayer that I had not prayed. I needed a dissertation topic, and Blanche's email contained the initial prompt, a memo to Ph.D. students from Doug Massey, who wrote as follows:

> Two recent reports have provided rather negative demographic and economic forecasts for New Jersey, and Governor Corzine's office is…looking for someone to do a fresh analysis to derive new insights that would help in directing economic development policy for the state and the region. The project would be conducted under the joint supervision of myself and Richard Keevey, the director of the Policy Research Institute on the Region, and the state would provide access to internal data on employment, taxes, and demographics to support the endeavor. Taking on the task would involve a significant investment of time between now and May, so the opportunity is probably practical only for post-generals students. The final report would be presented as a brief to Governor Corzine in May or June. If any students are interested, they should contact me directly.

I want to take this opportunity to acknowledge gratefully everyone involved in this email chain. From Blanche's email emerged the *Trends in New Jersey Migration* report, which launched a new research agenda and led to my dissertation. Rich Keevey advised Cristobal Young and me throughout the spring and summer of 2008, edited the report, taught us how to craft a proper executive summary of research findings, and wrote the press release for the report. Most importantly, Rich facilitated access to the New Jersey

Division of Taxation administrative data, which provided a brand new window on the study of elite migration and formed the basis for the analysis in Chapter 3.[1]

Doug Massey co-authored the *Trends in New Jersey Migration* report, chaired my dissertation committee, and served as Principal Investigator on the National Science Foundation grant which partly supported my doctoral dissertation research.[2] Doug's full support has never waivered. Whenever I was uncertain of the way forward, Doug provided well-timed nudges in the right direction. I have thought many times of a phone call that took place in August 2012. I was preparing to move to California, and I called Doug to let him know, and to update him on the status of my dissertation. In a 16-minute phone call, Doug once again provided new clarity about my research, but he did not stop there. He also agreed to recommend me for the job at Stanford that I still have, and he set me on a pathway toward dissertation completion. I will always remember that phone call, and I will be forever grateful to Doug for his solid backing through the years.

Cristobal Young also answered Doug's New Jersey memo, and so began the joint Varner-Young research initiative that continues to this day. Cristobal and I have worked together tirelessly now for almost 8 years, and I couldn't be prouder of the research we have done together. There have been many late nights, several late night methodological fights, and a few sojourns in the desert, all of which have contributed immensely to my dissertation. I am grateful for Cristobal's sharp sociological eye, his strategic thinking,

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[1] I am grateful to the National Tax Association, which granted permission to include, as Chapter 3, a slightly revised version of "Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment" (With Cristobal Young), 2011, *National Tax Journal* 64(2):255-84.

[2] This material is based upon work supported by the National Science Foundation under Grant No. 1130572. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

and his wisdom in the conduct of research. Cristobal is committed to the fundamental principles of science and to improving how we sociologists 'do science.' He demands that evidence be of the highest quality, triple-checked with the strongest methods, and replicable, all with the goal of advancing socio-economic theory and knowledge.

Cristobal Young is a true scientist, but more importantly, he is a true friend. He is a bulwark of stability, and his encouragement and wise counsel have been unfailing over the years. The line of research we have built together has proven to be a very worthwhile endeavor, and indeed it demonstrates how social scientific evidence should inform the public discourse. I look forward to elaborating this research program and to advancing social science with Cristobal for many years to come.

I also acknowledge all those who have made this work relevant in the public sphere. At last count, this research had the ear of at least three state governors. Early on, Gov. Jon Corzine called Cristobal and me to the New Jersey Governor's Mansion at Drumthwacket for a briefing on New Jersey migration patterns and potential effects on the state's economy. By 2011, Gov. Chris Christie had challenged our knowledge of millionaire migration. Here is what he said:

> "I'm shocked to know that a liberal professor from Princeton believes in higher taxes on rich people," Christie said when asked about the study. "When you're dealing with professors, certain things that are theoretical are interesting, but guys like me and Andrew Cuomo have to deal with what's real, and what's real is what happens on the ground," Christie said. "And what happens on the ground is, when they raise taxes, people leave to go other places, because they're the most mobile people to begin with." –Matt Katz, "Christie Discounts Princeton Study on "Millionaire's Tax", *Philadelphia Inquirer*, retrieved December 18, 2015 from http://articles.philly.com/2011-04-21/news/29459562_1_tax-filers-tax-rate-tax-foundation.

Of course, Christie's own state's tax records are our source of 'on the ground' knowledge on New Jersey millionaire migration. California Gov. Jerry Brown realized the strength of the administrative data approach, and was soon wielding a copy of the Varner-Young California analysis (Chapter 2) while campaigning across California for reelection on a platform to increase tax progressivity and resolve the state's budget crisis. I thank former New Jersey Gov. Jon Corzine for listening to my research, Gov. Chris Christie for elevating its profile, and Gov. Jerry Brown for taking my research to the people.

The analyses in this dissertation would not have received such high-level attention without the direct interest and involvement of state and federal researchers. My colleague Allen Prohofsky of the California Franchise Tax Board Economic and Statistical Research Bureau built the California tax data set that is analyzed in Chapter 2. I am grateful for Allen's analytic expertise and for his patient advice. His interest in making the California project happen played a crucial role in moving my dissertation forward. My colleagues Ithai Lurie and Richard Prisinzano of the U.S. Department of Treasury Office of Tax Analysis have been co-authors since 2013. Their keen economic thinking has been a crucial ingredient in our joint collaboration, not to mention the heavy lifting they have done with my Stata code. Ithai and Rich receive the equivalent of messily punched cards in the middle of the night, and when I wake up in the morning California time, clean results are waiting in my inbox without fail. I gratefully acknowledge their contributions to this work. Ithai, thank you for suggesting this collaboration at a National Tax Association meeting in Providence.

I have benefited greatly from previous public presentations of material in this dissertation at scholarly conferences or meetings of the American Sociological

Association (2010, 2011, 2013, 2014), the National Tax Association (2012-2014), the Population Association of America (2015), and the Social Science History Association (2011). Many other workshops and seminars through the years have also generated insightful commentary. I am grateful to Emmanuel Saez, Danny Yagan, Alan Auerbach, and participants in the Public Finance Seminar at the University of California–Berkeley; to Monica Prasad, Isaac Martin, and Ajay Mahrotra and participants in the 2011 Fiscal Sociology Workshop; and to all participants in the CPI Workshop and the Inequality Seminar at Stanford University.

My dissertation would not have been possible without the advice and support of many others. Paul Starr has been my adviser since I entered the Princeton Department of Sociology. When I was stubborn, Paul was always there to provide the proper intellectual and practical challenges to guide me back to the goal. Indeed he even came to Stanford last year, to the Center for Advanced Studies in the Behavioral Sciences. I met him there one afternoon last fall, we had a nice chat (during a solar eclipse), and I left the meeting more confident than ever that I would finish this study. Bob Wuthnow kindly brought me aboard as a research assistant in 2011, pointing me toward a new data source on fiscal attitudes. Bob's productivity is inspiring. His interest spurred my dissertation forward, and pointed the way toward the next project. Thank you, Miguel Centeno, for teaching me classical sociological theory, for giving me my first job as a research assistant in the department, and for being "delighted" when asked to serve as my final Princeton examiner. I am grateful to Blanche Anderson, Donna DeFrancisco, Cindy Gibson, Amanda Rowe, and Bobbie Zlotnick for their great kindness, patience, and support through the years. Thank you, Amanda, for making the final public oral

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Time does not permit me to name each and every person who has supported me in completing this dissertation. I apologize for this, and acknowledge here representatives of the many others in my dissertation "village." To Loh-Shan Leung and Liz Hwang and all my friends from Mississippi to Cambridge, Washington, New Haven, New York, California, and everywhere in between, thank you for your steadfastness despite my really infrequent emails. To Lily Faulhaber, thank you for understanding my tax research and for being an outstanding godmother. To Dawn B. Clare, Manorama Goodwin, and all others who have loved my children as if they were their own, know that you have

made all the difference. And to Judy Sullivan Bernal ("Momee"), E. Paul Dunn, Jr., Bernals, Dunns, and Varners, thank you for telling my mother and father not to worry.

As I draw this chapter to a close, I gratefully acknowledge my family-in-law and my family of origin. Your love has been constant throughout. This was not some amorphous feeling. Rather, you invested real caring capital in me and in this work. You showed up time and again to help me move, take care of my children, cook, clean, and distribute thousands of pieces of Halloween candy every year.

Linda Hoff, my mother-in-law, started a Ph.D. in education the same year I started Princeton. She has been my graduate school buddy throughout. She has valued this research, understood its complexities, and she has always been proud of me. Calvin Hoff, my father-in-law, provided much wise counsel, some of which I could not appreciate initially. Nevertheless, his strong and loving encouragement made it through to me, and it has served its intended purpose.

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My mother, Judy Bernal Varner, is the true paragon of loving care. She traveled to New York and California countless times to take care of me and my children. She would often take the red-eye back to Atlanta and on to Jackson, Mississippi to return to her full time job first thing on Monday morning. Once last year, she voluntarily traveled solo cross-country with my 18-month old son so that my wife and I could work. I know my mother was often more tired than I have ever been, yet she never once let it show. Rather she drank a diet coke and worked even harder to help me.

My father, Charles Edwin Varner, Sr., did the same. In 2013, while my wife was litigating a three-month trial in New York City, he and my mother moved to California to rear our 3-year old daughter while I started a new job at Stanford. As a stress reliever, my father also required that I play at least one round of golf or head out to the bowling alley with him once every six months or so. These activities provided crucial resets for the brain.

My brother and sister have loved me throughout. I would not be who I am without their calls, texts, and visits, which always lift my spirit tremendously. My brother, David Bernal Varner, should have been a sociologist. His deep passion for social issues is an ever-present reminder that this work matters and that transformative social change is possible. My sister, Helen Ann Campbell, is an amazing aunt. I am grateful for the quality time and care she has given to my kids over the years in New York, California, and Jackson, Mississippi. Put simply, David, Helen Ann, Kiersten, Bill, Sam, Kate, Ella, Charlotte, and Baby C., you make me happy.

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showed up time and again and kept me going. Know that my dissertation would not have been possible without you.

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And now, I dedicate this dissertation to my wife, Gretchen Ann Hoff Varner. You have supported me and this work in all ways. While I thought about millionaire migration, Stata, and regression discontinuity designs, you rented us an apartment, bore our children, moved us across the country, bought us a house, and provided an infinite supply of positive energy, all while you simultaneously brought down New York City's stop-and-frisk policing practice and became one of the top young litigators in this country. Thanks to your unceasing love, I am able to shine the light of day on my research and keep moving on. Merry Christmas, Sweetheart, and Happy New Year!

December 2015

Alameda, Calif.

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Chapter 1. The New Empirical Record on Tax Migration

Over the past forty years, the United States has seen a dramatic increase in economic inequality. Inequality in market income has been rising steadily since the 1970s, and is now at or above the previous 1928 high mark. In 2014, the top ten percent earned 49.9 percent of all pre-tax-and-transfer income, and the top one percent earned 21.2 percent (Saez 2015). This takeoff in inequality has been fueled by a peculiar mix of economic and political forces. Structural features of the postindustrial economy have raised the risks of poverty, increased the returns to wealth, and hollowed out the middle class in the process. In the midst of these structural changes, rather than attempt to slow inequality's climb with fiscal policy, the United States has instead pursued a regimen of fiscal reform, restricting the safety net and drastically cutting taxes. Federal tax policy has followed an opposite course from what might have been expected. Up through the 1970s, the U.S. had a very progressive income tax, when compared with similar countries. In 1981, the federal tax rate on top incomes stood at 70 percent—the fourth highest among 24 OECD countries. Yet as inequality rose, U.S. tax rates on the rich fell sharply, and by 2010, the federal top rate had been cut in half, to 35 percent—the fifth lowest among the same OECD countries.[1]

[1] The U.S. combined top statutory personal income tax "inclusive of surtaxes and sub-central income taxes" was 77.6 percent in 1981 (OECD 2014:5). The average among 24 OECD countries was 66 percent. In 2010, the U.S. rate was 41.9 percent, and the average was 42.8 percent among the same set of countries. The U.S. federal top marginal rate was 35 percent between 2003 and 2012. The current rate is slightly higher, and is the same as it was during the Clinton administration (39.6 percent). Otherwise, it has been 35 percent or below since 1988 (http://taxfoundation.org/article/us-federal-individual-income-tax-rates-history-1913-2013-nominal-and-inflation-adjusted-brackets).

The result has been the evisceration of redistribution at the federal level, and the rising tide of economic inequality. However, despite the mostly downward trend in income taxation at the federal level, a bold experiment in fiscal policy has been happening in U.S. states. Since 2004, nine states and the District of Columbia have added new tax brackets that apply only to the very top of the income distribution (Table 1.1). "Millionaire taxes" have been seen as policy levers that can bridge budget gaps and reduce income inequality.[2] Indeed, in 2010, Congress itself began to add taxes that are limited to the highest brackets. The Affordable Care Act (ACA) included a new 3.8 percent Medicare tax limited to the interest, dividends, and capital gains of individuals with incomes over $200,000 (Starr 2015). This "net investment income tax" became effective in 2013, as did higher rates on capital gains and on regular income above $400,000, and is perhaps one reason that Republicans have been so eager to repeal the ACA.[3]

But are the fiscal and redistributive results of state-level millionaire taxes sustainable? While federal tax progressivity remains low by historical standards, can states take a more aggressive course on redistribution? The three substantive chapters included in this dissertation thus consider the question of whether, in response to

[2] It should be noted that "market inequality" is not of course determined invisibly and independently of political action (Weeden and Grusky 2014). For example, Thomas Piketty (2014) attributes the sharp rise in U.S. executive compensation to the tax cuts that came first. This caveat aside, I am concerned here with the direct effects that state fiscal policy can have on inequality.

[3] I am grateful to Paul Starr for this point, and for the further point that this particular fiscal policy constituted an important break with the historical approach of funding Social Security and Medicare entirely through wage taxation.

increased state taxation of millionaires, those elite taxpayers will stay and pay increased taxes, or simply migrate to states with lower tax burdens.[4]

Conservative policy-makers have consistently argued that states cannot have progressive tax systems. States have open borders; people are free to migrate between states. Higher taxes raise the implicit price of the social contract, and millionaires may be just the people who are best positioned to exit to a lower-tax state. Or, as Donald Trump said when asked in 2008 about New York's proposed millionaire tax, "I think it's a great idea—if you are looking to force rich people to move to states like Florida" (Peters 2008).

The economics literature follows a similar, if more nuanced, logic. To the extent that high tax rates on top incomes prompt "enough migration" of the rich, Feldstein and Wrobel (1998:371) argue that redistribution is impossible in U.S. states, and indeed in any jurisdiction with free migration to lower-tax places (e.g., countries in the European Union). Without regional, national, or perhaps even global cooperation in rate-setting, tax migration would seem to render progressive taxation unsustainable—and increasingly so in the wake of faster long distance travel, better global communication infrastructure, remote work, and more open international borders. Feldstein and Wrobel argue that migration is the mechanism whereby "gross wages adjust rapidly to the changing tax environment" (1998:391).

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[4] As discussed later, these three chapters are: "Millionaire Migration in California: The Impact of Top Tax Rates" (With Cristobal Young), Stanford Center on Poverty and Inequality Working Paper; "Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment" (With Cristobal Young), 2011, National Tax Journal 64(2):255-84, Best Graduate Student Paper, American Sociological Association Section on Public Sociology; and "Millionaire Migration and the Taxation of the Elite: Evidence from Administrative Data" (With Cristobal Young, Ithai Lurie, and Richard Prisinzano), Accepted: *American Sociological Review*.

Table 1.1. New Millionaire Taxes since 2004

State	Effective since	Top Bracket	Top Rate	Pct. Point Increase
California	2005/2012	$1,000,000	10.30/13.30	1.00/3.00
New Jersey	2004	$500,000	8.97	2.60
New York	2009	$500,000	8.97	2.20
Oregon	2009	$250,000	11.00	2.00
Minnesota	2014	$250,000	9.85	2.00
Maryland	2008	$1,000,000	6.25	1.75
Connecticut	2010	$500,000	6.50	1.50
Hawaii	2009	$200,000	11.00	1.00
Wisconsin	2009	$225,000	7.75	1.00
D.C.	2012	$350,000	8.50	0.45

Note: Excludes states that cut top rates while raising top brackets. For example, in 2001, North Dakota cut its top rate from 12% to 5.54%, even though it raised its highest bracket from $50,000 to $297,350.

Yet evidence for the migration mechanism had been virtually nonexistent with respect to both progressive taxation in general and to "millionaire taxes" in particular. The absence of any empirical record in economics is remarkable, especially in light of the considerable attention economists have devoted to uncovering the analogous cross-state welfare migration of the poor (cf. Brueckner 2000). However, the silence from sociology is more striking still. Political sociologists have had a longstanding interest in the tax capacity of the state (Schumpeter 1918; Tilly 1990; Centeno 1997; Martin, Mehrotra, and Prasad 2009). There has been less attention, however, to the potential threat that elite migration poses to such capacity or to the effect of this threat on state tax structure. This is surprising given that tax migration lies at the intersection of three core sociological domains: migration, the social embeddedness of economic action, and the future of the welfare state.

First, the migration literature has demonstrated the importance of social ties in migration behavior. Sociologists have transformed a wage-centric model to show how social network mechanisms interact with economic considerations to give migration its self-reinforcing dynamic (Massey 1987). Family, ethnic, and other social connections are foundational in the economic sociology of migration, and the social capital embedded in such connections has been seen as a key resource for migrants (Portes and Sensenbrenner 1993), as evidenced in immigrant enterprise formation throughout the globe (Granovetter 1995). However, the sociological literature has never previously focused on the conditions associated with migration in the top echelons of society.[5]

Second, tax migration raises important sociological questions about the embeddedness of economic elites. That social ties shape the migration behavior and the economic action of elites and would-be elites will not come as a surprise to sociologists. Yet without empirical evidence, sociologists have effectively conceded the debate about the role of tax policy in millionaire migration to those who argue for the most individualistic and market-based approaches to tax migration. Accordingly, an empirical measurement of millionaire migration, from the sociological perspective, provides valuable evidence as to the actual embeddedness of elites. The exit responsiveness of millionaires to variability in state income taxation is an important measure of the significance of the bonding capacity of social structure, as applied to the most powerful and well-resourced members of society.

[5] There has been some attention to the migration of professional and scientific elites. Favell (2003) finds that European professionals have difficulty transferring their social capital across borders, and Laudel (2005) argues that national policies aimed at attracting established "star scientists" may not work.

I address two dimensions of elite embeddedness in this dissertation, one demographic and the other socio-economic. Contrary to popular perception, many millionaires are not in a life course stage that is particularly conducive to migration. Many are the "working rich", who tend to be married and have children in the home, three factors which reduce the propensity to migrate. Moreover, the findings in this dissertation suggest that elite earning capacity depends on place-specific relations. The persistence of place is the flip side of the cumulative causation logic of migration (Massey 1990; Myrdal 1957). Once a productive and remunerative niche has been established, the risk of out-migration decreases. At the same time, in-migration becomes increasingly attractive to those seeking to locate in a place that has demonstrated capacity to breed success. The socially contingent nature of successful enterprise suggests that states can tax such niches with little risk of net out-migration of the rich.[6]

Finally, the role of elite embeddedness in tax policy has profound consequences for the welfare state. Fiscal austerity is not unique to the United States, but the conservative impetus to cut taxes is especially pertinent for inequality in the American context. The U.S. "pioneered" the progressive income tax system (Piketty 2014:348), and this system accounts for a greater share of total redistribution in the United States relative to other countries (Kenworthy 2008). In the U.S., social expenditures per capita

[6] As Paul Starr noted to me, this is relevant to Carles Boix's (2003) perspective on the relationship between capital mobility and democracy. Boix assumes that more liquid forms of capital (i.e., "modernized" capital and human capital) are more difficult to tax because they are mobile. I do not address the mobility of capital *per se* in this dissertation, but rather the mobility of individuals. However, to the extent that elite earnings depend on place-specific social relations (i.e. inert *social* capital), this would suggest a constraint on the capital mobility mechanism that produces Boixian low-tax worker-elite bargains that support democracy. This constraint (and its potential implications for democracy) could be the subject of future empirical testing.

are lower and more targeted to the poor, which results in less redistribution overall. This "paradox of redistribution" (Korpi and Palme 1998) happens on the tax side as well, as deductions and credits are mostly targeted to the upper income brackets, with the exception of the earned income tax credit (Howard 1997). These features of the fiscal state mean that progressivity—i.e., "who pays" the tax burden—has weighed more heavily in the overall post-tax-and-transfer distribution of resources in the United States.

Yet even with tax progressivity, the U.S. redistributes less than other advanced democracies. There are many potential explanations for this, including the following: low attitudinal support for equality (Lipset and Bendix 1959); the belief that equality is primarily constituted on moral rather than economic grounds (Lamont 2000); comparatively weak class foundations of American political parties (Quadagno 1987); elite power and the influence of the affluent (Mills 1956; Gilens 2012); ethnic and racial heterogeneity (Alesina and Glaeser 2004); racialized beliefs about the poor (Gilens 1999); spatial segregation of affluence and poverty (Massey 2007); institutional features of the federal system (Skocpol 1992); and greater reliance on privatized service delivery (Starr 1988; Starr 1990).

Some scholars have argued that the progressive income tax itself, by reducing overall revenues, placed limits on the amount of redistribution that could be accomplished (Kenworthy 2008; Prasad 2012). Flatter consumption taxes, like the value added tax (VAT) used in almost all other advanced democracies, are associated with greater state revenues. It is unclear whether a VAT would increase redistribution in the United States. However, it is clear that recent reductions in U.S. tax progressivity have not been designed with this aim.

In a country like the United States that is politically polarized by region and where income taxation plays a major role in redistribution at the state level, it is essential to understand what value the rich derive from geographically bounded social and economic connections—in short, to understand the embeddedness of the elite. Elite embeddedness has broad implications for the level of redistribution that can occur at the subnational level. In the United States, if elites are more embedded in given states— that is, if they are unlikely to migrate in response to taxation—that suggests that downward political pressures on redistribution that manifest at the federal level can be mitigated in states where voters desire more equality.

This principle applies even more strongly in an international context where linguistic and cultural differences serve as additional embedding forces. In Europe, economic and political integration is generating more inequality, but the effect of integration on the welfare state has not been well understood (Beckfield 2006). In a world without borders, where relocation is no longer constrained by immigration requirements, there is an open question as to whether national welfare states can use tax policy to respond to the inequality effects of increasing integration.

This dissertation addresses these three critical areas of inquiry by presenting the new quantitative evidence that I have developed with my colleague Cristobal Young on the internal migration of U.S. elites since the 1990s. The data cover all millionaires in the country from 1996 to 2011, all New Jersey tax filers from 2000 to 2007, and all California tax filers since the early 1990s. The results demonstrate that the income tax effect on millionaire migration is small, or very small. Millionaires do "move to Florida," but they are not likely to do so in response to higher taxes, or more steeply

progressive tax codes. Rather than acting as free agents, as suggested by Donald Trump, and by the economics literature, elites are embedded in cities, in counties, and in states. These results suggest that elite embeddedness permits redistributive effort at the state (and national) levels, even in an era of rising geopolitical interconnectedness.

The Limits of Tax Migration in Theory and Evidence

In the neoclassical theory of migration, people move when the cost of living does not match the benefit of a particular location. Borjas, Bronars, and Trejo (1992) model migration as a function of the wage return to skill. When an individual's skill does not match well with conditions in the local economy, his or her wage is low relative to what it would be in a place that provides a better skill supply-demand match. Migration corrects a skill mismatch. Where people live is not where the (good) jobs are, and migration corrects this problem. Income taxation enters this model because it changes the return to skill by altering one's take-home wage. This mechanism implies that migration flows will be affected when a state raises taxes (inducing out-migration) or lowers taxes (inducing in-migration).

It is important to note that taxes are just one component in the regional cost of living. Thus, varying state tax rates might *not* induce migration if higher tax states also provide higher quality public goods, or more generally if they capitalize a set of locally-specific amenities (including climate, coastal access, topographic variation, in addition to education and other public goods). Nevertheless, tax changes should induce some people to move unless the location-specific bundle of amenities has been under-priced (i.e., under-taxed) by the state. Under-pricing situations might occur if the state suddenly

becomes relatively more attractive due to changes in preferences of the potential population, or due to an exogenous shock. For example, the new attractiveness of the southwestern United States induced by widely available air conditioning might have been capitalized in state tax increases, in house prices, in higher wages, or some combination thereof.

For the general population, cross-state tax arbitrage opportunities are not important factors in residential decision-making. Even within commutable regions where amenity differences are small, differential tax rates do not matter much for migration. Existing research suggests that the number of people who actually choose lower taxes is low, even when moving just a few miles would result in a lower tax rate (Liebig, Puhani, and Sousa-Poza 2006; Coomes and Hoyt 2008). Low migration response among the general (non-rich) population suggests that the transaction costs of moving, but also the proximity of income-generating jobs, family, and friends, are strong deterrents to tax migration.

However, the calculus of residential choice may be different for the rich. They can easily absorb the "moving truck" costs and even sustain the temporary disruption in income that might be associated with changing jobs or opening up a new business. Moreover, returns to human capital (i.e. wages and salary) are but one of several potential income sources for the rich. Top earners may face fewer geographic constraints on earning capacity, and thus migration behavior may depend more on the "tax price" of a given jurisdiction. Moreover, the greater ability of the rich to avoid the use of public goods (e.g., by choosing private over public schools) may lower or even eliminate any perceived benefit of paying a higher tax rate. Thus, the risk to states in taxing top

incomes is that the rich will avoid the tax. While avoidance can occur via several means, states have been particularly concerned about net outflows of the highly-skilled and the highly-moneyed. The worry is that these individuals will "vote with their feet", reducing state tax revenues and discouraging economic growth, unless out-migrants' influence on the state economy is replaced by new sources of production.

The idea of "tax flight" gives the impression that the rich will readily move, even changing states in response to small tax differences. But how applicable is the model of Borjas et al. (1992) to the actual migration patterns of the rich, who are evidently doing so well in their current location? They can easily "afford" the move, but their true migration costs are much more complex. All potential migrants must face the loss of proximity to a social network of friends and family, but for the rich, the existing social network has almost invariably yielded elite status (in addition to substantial material returns and reserves of social capital). The Borjas et al. model is too limited in this respect. Rather, we need a more general model that incorporates status in its explanations of social behavior (Lenski 1954). For low-status individuals, "status inconsistency" provides a better model for migration behavior than skill mismatch, yet little research has developed this model in a high-status context (Lee, Toney, and Berry 2009:37).

In this study, evidence for low migration response to taxation among the rich suggests that states and the places within them may create conditions of "surplus status" for elites. For the rich, migration entails the loss of known income-generating opportunities, which surely induces a considerable degree of inertia. Yet elites may be even more reluctant to yield their exceptionally high status within a place-specific "congealed" network (Granovetter 1992:8). Places are not all the same. States, cities,

counties, and towns change how people make meaning in their lives and careers, and this process yields, in turn, a collectively-and locally-constructed sense of place (Wuthnow 2013). Elites are not immune from this social construction process, and indeed they are heavily invested in it.

A New Demography of the Elite

Why has social science effectively conceded that tax migration precludes redistributive taxation when there is free migration across state borders? It is not for lack of attention to similar questions. In sociology, there is a growing literature on the effects of "disappearing borders" on welfare state effort and on inequality (Beckfield 2006; 2013). Likewise, economists and political scientists have tested the putative "race to the bottom" in benefit levels prompted by welfare migration between states (and have found only weak evidence).[7]

Lack of data is the main reason for the limited empirical literature on tax migration. While there are many anecdotes about the jet-setting one percent (Stewart 2012), their actual migration patterns have been difficult to observe systematically. Millionaires are a hard-to-reach population, and as a result, the illusion of millionaire migration has had staying power. Even if the rich move to Florida primarily to retire in a warm climate full of luxury resorts, explanations frequently include tax savings as a

[7] In this theory, welfare provision is biased downwards as welfare migrants move to states that have higher benefit levels, thus attracting displeasure from voters and downward pressure on benefits. However, evidence for actual welfare migration between U.S. states is "sometimes small, while other studies show the absence of migration" (Brueckner 2000:508).

primary motivating factor in the decision to move (Office of the Chief Economist of the New Jersey Department of the Treasury 2011).

Prior to this study, however, quantitative data on millionaires was highly fragmentary. Even the largest of traditional surveys, the American Community Survey (ACS), collects only a small sample of top earners (i.e., about one percent of the one percent). To compound matters, migration is an infrequent event, which means that the ACS sample of millionaire migrants is tiny. Finally, data on millionaire migration at the state level and on state-to-state millionaire migration flows are miniscule or missing in traditional surveys, and thus are not useable in quantitative analysis.[8]

With the increasing availability of large administrative data sets for research, it has become possible to study small geographic areas (e.g., states), small populations (e.g., millionaires), infrequent behaviors (e.g., migration), and events that interact all three (e.g., state-to-state millionaire migration). Administrative data are a class of data that occupies a middle range between the "designed" data of social surveys and the "organic" big data routinely collected by private sector entities (Groves 2011). Tax returns are routinely collected, once per year for the purpose of paying taxes, but they also provide near full population coverage of demographics typically collected in a survey. Income, marital status, number of children, and broad age categories are easily analyzed, and with some additional coding, occupation and perhaps other socio-demographic variables also become available. For example, with tax record panel data, it

[8] A further complication is that the top-coding process in the American Community Survey makes it impossible to distinguish millionaire households from non-millionaire households (Young, Varner, and Massey 2008). It is not possible to distinguish the actual income level for either type of household, only that income is above the top-code threshold.

may be possible to define educational attainment via credit-claiming behavior on widely available tuition tax credits.

A distinctive benefit of big administrative data is the new demography of small populations that it permits. In the old regime, social science had to rely on qualitative analysis of small, even if influential, populations. Now it is possible to study elites across an entire state or country. Prior to the advent of big administrative data, we had no way to know the basic characteristics of hard-to-reach populations, like millionaires, or to compare their characteristics to those of the general population. The question "Are the rich different?" could not be answered in demographic terms. The impossibility of such an analysis facilitated concerns that state progressive taxation would lead to tax flight among a subpopulation that was perceived to be highly mobile.

However, the tax data reveal that millionaires face stronger constraints on migration than the general population does. Millionaires are more likely to be married, to be in a dual-career household, to have school-age children, to own rather than rent their home, and to own a business. The demographic angle of analysis—which was not previously possible—further explains why elite tax migration is so rare.

The present study demonstrates the transformative capacity new troves of administrative data can have for both sociological research and social policy. As described in more detail below, the infrastructure required—to clean the raw administrative data, define the explanatory and outcome variables, and link individual and household records over time—is immense. Indeed, sociologists are championing efforts to fund and build similar infrastructures for coding and combining the multiple administrative data sources that are now becoming available (Grusky et al. 2015).

Likewise, the President of the Population Association of America has called on demographers to lead the charge in conducting research on the estimated 6 billion individual-level records that will become available over the next several years (Ruggles 2014). The reward of such efforts is new understanding of the mechanisms of inequality, and also, as evidenced by the present study, those mechanisms that permit greater redistributive effort.

Three Analyses of Millionaire Migration

This dissertation was conducted at the forefront of the new administrative data research movement that is taking place in sociology, demography, and economics. At the request of the New Jersey Office of Economic Growth, Cristobal Young and I joined with Professor Douglas S. Massey to write a report on New Jersey migration trends. The State of New Jersey sought to evaluate claims that elites were purportedly leaving the state in droves as a result of New Jersey's 2004 millionaire tax. We thought the latter scenario was unlikely (Varner and Young 2008), and our report (Young, Varner, and Massey 2008) launched our millionaire migration research initiative.

This initiative is a joint collaboration; the order of authors is random and non-meaningful. From the beginning, Cristobal Young and I have worked closely together to (a) conceptualize the theoretical problem of millionaire migration, (b) build the required data infrastructure, (c) define the appropriate identification strategies, (d) conduct the analyses, and (e) write, publish, and present the results. The analyses below (chapters 2, 3, and 4) constitute the major result of this initiative to date: the establishment of a new empirical record on millionaire migration in the United States.

In building this empirical record, we have been very fortunate to have worked with top researchers in the New Jersey Division of Taxation (NJDT) and the California Franchise Tax Board (FTB). Indeed, this research would not have been possible without the advice of James Moore and Yustina Saleh of the NJDT, the dedication of Sean Lawrence in building a 20-year panel data set of California tax filers, and our continuing collaboration with Allen Prohofsky and his staff at the FTB Economic and Statistical Research Bureau. The good fortune had a way of building on itself. Three years ago, while presenting the California working paper at the National Tax Association annual meeting in Providence, Ithai Lurie of the U.S. Department of Treasury Office of Tax Analysis (OTA) approached me about collaborating on a nationwide study of millionaire migration using confidential IRS data. Of course, we said yes, and both Ithai and Richard Prisinzano joined us as co-authors on the third analysis (chapter 4), which has been accepted for publication in the *American Sociological Review*.

In total, the data sets underpinning this dissertation include approximately 500 million tax records, which had never been previously studied for this purpose. We used these records to construct an 18-year panel of all tax filers in California (1992-2009), an 8-year repeated cross-section of all tax filers in New Jersey (2000-2007), a 13-year panel of all millionaire tax filers in the United States (1999-2011), a 13-year 1% sample panel of all tax filers in the United States (1999-2011), and a 16-year repeated cross-section of the millionaire population in all 3,140 counties in the United States (1996-2011). The core analyses follow in three chapters.

Chapter 2, "Millionaire Migration in California: The Impact of Top Tax Rates" (with Cristobal Young), lays out the socio-economic model of elite migration and

persistence. It then describes the creation of the analysis panel from the administrative tax records provided by the California Franchise Tax Board and how these data are used to define migration events. The empirical intuition follows. This section formulates two identification strategies for measuring a tax migration effect of a tax change. The first strategy compares the before-after migration trends of the millionaire treatment group to the migration trends of a high-income control group earning just below the new tax. The second strategy, illustrated in Figures 2.1–2.4 of Chapter 2, examines whether the migration effect of the tax change grows with income in the treatment group.

We expect this pattern because the new rates are marginal rates, which phase in as income rises above the new tax bracket's starting point. As a marginal tax rate, the new rate only applies to earnings above $1 million. Thus, for individuals earning $1,000,001, their tax increase is 1 penny. For those making $10,000,000, their tax increase is $90,000. The magnitude and the effective rate of the tax hike grow with the amount earned above $1 million. Thus, we not only expect a net migration response for the treatment group relative to controls (strategy 1). We also expect that any effect of the tax hike would grow with income in the treatment group (strategy 2). These two difference-in-difference strategies provide the core empirical intuition for identifying tax migration effects.

Chapter 2 uses these strategies to analyze two tax changes in California. These changes would have been expected to prompt changes in the migration trends of California millionaires. However, in neither case does out-migration or in-migration show consistent evidence of a tax migration effect. With respect to a 2005 tax increase on income above $1 million, millionaires' out-migration declined after the tax, both in

absolute terms and when compared with a control group of top earners who were not subject to the tax change. Chapter 2 also explores why millionaires do not migrate in response. The panel nature of the data reveals that most California millionaires are having an unusually good year (Chapter 2, Figure 4.5). This finding suggests that the transitory nature of very high income is one reason why there is no observable tax migration. It is difficult to migrate away from an unusually good year of income.

Chapter 3, "Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment" (with Cristobal Young), incorporates the difference-in-difference identification strategy into formal regression models for evaluating the effect of a tax policy change on migration of the elite, and applies these models to an analysis of the largest state tax change last decade, a 2.6 percentage point increase in New Jersey, enacted in 2004. The New Jersey analysis constitutes a "most likely" research design. Whereas cross-state migration is comparatively rare in a large state like California, whose major population centers are located far from state borders, New Jersey is in the middle of large multi-state megalopolis.

In principle, elites could have taken advantage of tax arbitrage opportunities with very short-distance moves, while keeping their same jobs (in New York City or Philadelphia) and keeping their social networks completely intact. Nevertheless, tax migration in response to the tax increase is not statistically significant for most groups. Semi-elasticities are generally below 0.1. The more embedded elites are (e.g., by earning most of their income from wages or through business ownership) the less likely they are to have migrated in response to the tax change. Less embedded elites (e.g. those who are

retiring and those who earn all of their income from capital) have greater migration responsiveness to the tax change.

Chapter 4, "Millionaire Migration and the Taxation of the Elite: Evidence from Administrative Data" (with Cristobal Young, Ithai Lurie, and Richard Prisinzano), addresses the evidence for tax migration using a full gravity model. Here, in addition to tax changes, we also examine the effects of long-term differences in state tax rates. We find that there is weak evidence for elite migration across state borders, and that this appears to be driven by demographic factors that embed elites in their local communities. Chapter 4 concludes with a regression discontinuity design that matches adjacent border counties in order to compare millionaire populations on the higher- and lower-tax (treatment vs. control) sides of state borders.

Taken together, the central three analyses of this dissertation test for elite migration responsiveness to changes and to level-differences in state top income tax rates. Methodologically, these analyses do the following: (a) identify migration events in the administrative data (chapter 2); (b) estimate formal difference-in-difference regression models in a most-likely research design (chapter 3); and (c) measure the tax migration responsiveness of all millionaires in the United States using both a log-linear gravity model of state-to-state flows and a most-likely regression discontinuity model of millionaire populations along state borders (chapter 4). The results of these analyses demonstrate how existing migration theories apply to the elite. Low exit responsiveness of elites to progressive taxation is the result of elite demography, economic embeddedness, and social embeddedness. Millionaires are less frequently in mobile stages of the life course than previous survey data and anecdotal accounts would have

suggested (chapter 3, chapter 4). Millionaires are reluctant to move away after exceptionally good years of income (chapter 2). And finally, the long-term stability of millionaires in their current state and county of residence (chapter 4) suggests that they are enmeshed in local and regional elite networks. These socio-spatial niches provide significant reserves of social capital. Elites will likely be reluctant to relinquish this important source of future economic returns. Finally, local and regional elite networks constitute geographically-specific status, which may embed elites more strongly than any pecuniary concern.

In Chapter 5, I consider the implications of low elite migration responsiveness to state tax rates for economic and sociological theory, for state fiscal policy, and for future research on the social and political determinants of welfare state effort. First, the new empirical record on tax migration fundamentally alters the theoretical debate on the possibility of redistribution at the subnational level. The answer to the question "Can State Taxes Redistribute Income?" had, for many years, simply been "No." Elite migration was seen as the mechanism that would make progressive taxation unsound as a matter of state fiscal policy. Progressive taxation could only have redistributive effects at the national level, and even that result was seen as tenuous in the presence of open international borders. European Union countries could, for example, expect similar downward pressure on progressive tax rates. The empirical record established in chapters 2, 3 and 4, demonstrates that such pressures are significantly constrained by a social process that enmeshes elites in particular communities. This finding stands in stark contrast to the oft-cited notion that the rich are footloose. However, these analyses show that the importance of place in the establishment of the elite must not be underestimated.

Joint economic production in a given place (e.g., the Silicon Valley) can agglomerate into extraordinary returns. Moreover, place itself is constitutive of social and cultural capital. Once elites are engaged in a place, they are not inclined to leave. Elite networks operate on this kind of embeddedness to produce both economy and society, and indeed it is by virtue of this process that modern states (and nations) can have progressive taxes.

Nevertheless, U.S. states had tended to rely on an individualistic understanding of elite behavior, and their income tax rates had remained quite flat as a result. As income inequality spiked, however, some states implicitly tested tax migration theory by introducing new taxes at the very top of the income distribution. These policy experiments raised substantial revenues and directly reduced income inequality in the states that enacted them. Since elite migration responses are small, or very small, we now know that state taxes can be redistributive. This is the second main implication: States can have progressive income taxes, and fiscal policy-makers need not fear any exodus of millionaires.

Finally, as I conclude in Chapter 5, this dissertation implies a new path for research on the determinants of redistributive effort, and in particular on how elites actually affect the amount of redistribution that occurs (without moving). This program encompasses the actual determinants of elite mobility and embeddedness; the social construction of elite threats of exit; and the broader causes and redistributive consequences of progressive taxation at the state (and national) levels. With the empirical evidence on elite tax migration having been mustered, the larger research program now goes forward.

References

Alesina, Alberto, and Edward Ludwig Glaeser. 2004. *Fighting Poverty in the US and Europe: A World of Difference*. Oxford: Oxford University Press.

Beckfield, Jason. 2006. "European Integration and Income Inequality." *American Sociological Review* 71(6):964-985.

Beckfield, Jason. 2013. "The End of Equality in Europe?" *Current History* March 2013:94-99.

Boix, Carles. 2003. *Democracy and Redistribution*. Cambridge University Press.

Borjas, George J., Stephen G. Bronars, and Stephen J. Trejo. 1992. "Self-Selection and Internal Migration in the United States." *Journal of Urban Economics* 32(2):159-185.

Brady, David, Jason Beckfield, and Martin Seeleib-Kaiser. 2005. "Economic Globalization and the Welfare State in Affluent Democracies, 1975–2001." *American Sociological Review* 70(6):921-948.

Brueckner, Jan K. 2000. "Welfare Reform and the Race to the Bottom: Theory and Evidence." *Southern Economic Journal* 66(3):505-525.

Centeno, Miguel Angel. 1997. "Blood and Debt: War and Taxation in Nineteenth-Century Latin America." *American Journal of Sociology* 102(6):1565-1605.

Coomes, Paul A., and William H. Hoyt. 2008. "Income Taxes and the Destination of Movers to Multistate MSAs." *Journal of Urban Economics* 63(3):920–937.

Favell, Adrian. 2003. Games Without Frontiers? Questioning the Transnational Social Power of Migrants in Europe. *European Journal of Sociology* 44(3):397-427.

Feldstein, Martin, and Marian V. Wrobel. 1998. "Can State Taxes Redistribute Income?". *Journal of Public Economics* 68(3):369-396.

Gilens, Martin. 1999. *Why Americans Hate Welfare: Race, Media, and the Politics of Antipoverty Policy*. University of Chicago Press.

Gilens, Martin. 2012. *Affluence and Influence: Economic Inequality and Political Power in America*. Princeton University Press.

Granovetter, Mark. 1992. "Economic Institutions as Social Constructions: A Framework for Analysis." *Acta Sociologica* 35(1):3-11.

Granovetter, Mark. 1995. "The Economic Sociology of Firms and Entrepreneurs." Pp. 128-165 in A. Portes, ed., *The Economic Sociology of Immigration: Essays in Networks, Ethnicity and Entrepreneurship.* New York: Russell Sage Foundation.

Groves, Robert. 2011. "'Designed Data' and 'Organic Data'". Retrieved Nov. 17, 2015 (http://directorsblog.blogs.census.gov/2011/05/31/designed-data-and-organic-data/).

Grusky, David B., Timothy M. Smeeding, and C. Matthew Snipp. 2015. "A New Infrastructure for Monitoring Social Mobility in the United States." *The Annals of the American Academy of Political and Social Science* 657(1):63-82.

Howard, Christopher A. 1997. *The Hidden Welfare State.* Princeton University Press.

Kenworthy, Lane. 2008. "Taxes and Inequality: Lessons from Abroad.," Retrieved Nov. 22, 2015. (http://lanekenworthy.net/2008/02/10/taxes-and-inequality-lessons-from-abroad/).

Kenworthy, Lane and Jonas Pontusson. 2005. "Rising Inequality and the Politics of Redistribution in Affluent Countries. *Perspectives on Politics* 3(3):449–471.

Khan, Shamus. 2012. "The Rich Haven't Always Hated Taxes." Time. http://ideas.time.com/2012/09/18/the-rich-havent-always-hated-taxes/.

Korpi, Walter, and Joakim Palme. 1998. "The Paradox of Redistribution and Strategies of Equality: Welfare State Institutions, Inequality, and Poverty in the Western Countries. *American Sociological Review* 63(5):661-687.

Lamont, Michelle. 2000. *The Dignity of Working Men: Morality and the Boundaries of Class, Race and Immigration*. Cambridge: Harvard University Press.

Liebig, Thomas, Patrick Puhani, and Alfonso Sousa-Poza. 2006. "Taxation and Internal Migration: Evidence from the Swiss Census Using Community-Level Variation in Income Tax Rates." IZA Discussion Paper No. 2374. Forschungsinstitut zur Zukunft der Arbeit, Bonn, Germany.

Laudel, Grit. 2005. "Migration Currents among the Scientific Elite." *Minerva* 43:377-95.

Lee, Ji-youn, Michael B. Toney, and E. Helen Berry. 2009. "Social Status Inconsistency and Migration." *Research in Social Stratification and Mobility* 27(1):35-49.

Lenski, Gerhard E. 1954. "Status Crystallization: A Non-vertical Dimension of Social Status." *American Sociological Review* 19(4): 405-13.

Lipset, Seymour. M. 1996. *American Exceptionalism: A Double-Edged Sword*. New York: W.W. Norton.

Lipset, Seymour. M., and Reinhard Bendix. 1959. *Social Mobility in Industrial Society*. Berkeley, CA: University of California Press.

Martin, Isaac William, Ajay K. Mehrotra, and Monica Prasad. 2009. *The New Fiscal Sociology: Taxation in Comparative and Historical Perspective*. Cambridge: Cambridge University Press.

Massey, Douglas S. 1987. "Understanding Mexican Migration to the United States". *American Journal of Sociology* 92(6):1372-1403.

Massey, Douglas S. 1990. "Social Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56(1):3–26. doi:10.2307/3644186.

Massey, Douglas S. 2007. *Categorically Unequal: The American Stratification System*. New York: Russell Sage Foundation.

McCall, Leslie, and Lane Kenworthy. 2009. "Americans' Social Policy Preferences in the Era of Rising Inequality." *Perspectives on Politics* 7(3):459-484.

Mills, C. Wright. 1956. *The Power Elite*. Oxford University Press.

Myrdal, Gunnar. 1957. *Rich Lands and Poor*. New York: Harper and Row.

OECD. 2014. "FOCUS on Top Incomes and Taxation in OECD Countries: Was the Crisis a Game Changer?" http://www.oecd.org/social/OECD2014-FocusOnTopIncomes.pdf, http://www.oecd.org/els/soc/OECD2014-FocusOnTopIncomes-Figures-Data.xlsx.

Office of the Chief Economist of the New Jersey Department of the Treasury. 2011. "New Jersey Migration Survey." Retrieved Nov. 22, 2015 (http://www.state.nj.us/treasury/gsef/NewJerseyMigrationSurvey.pdf).

Prasad, Monica. 2012. *The Land of Too Much: American Abundance and the Paradox of Poverty*. Cambridge, MA: Harvard University Press.

Peters, Jeremy W. 2008. "Millionaires Have Range of Opinions on Tax Plan." *New York Times*. March 23.

Portes, Alejandro and Julia Sensenbrenner. 1993. "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action." *American Journal of Sociology* 98(6):1320-50.

Quadagno, Jill. 1987. "Theories of the Welfare State." *Annual Review of Sociology* 13:109-128.

Ruggles, Steven. 2014. "Big Microdata for Population Research." *Demography* 51(1): 287-297.

Saez, Emmanuel. 2015. "Income Inequality in the United States, Table and Figures Updated to 2014." Retrieved November 19, 2015 (http://eml.berkeley.edu/~saez/TabFig2014prel.xls).

Schumpeter, Joseph A. 1918. *The Crisis of the Tax State*. Reprinted as pp. 99–140 in *The Economics and Sociology of Capitalism*, edited by R. Swedberg. Princeton, N.J.: Princeton University Press.

Skocpol, Theda. 1992. *Protecting Soldiers and Mothers*. Cambridge, Mass.: Harvard University Press.

Starr, Paul. 1988. "The Meaning of Privatization." *Yale Law and Policy Review* 6: 6-41.

Starr, Paul. 1990. "The New Life of the Liberal State: Privatization and the Restructuring of State-Society Relations." Pp. 22-54 in J. Waterbury and E. Suleiman, eds., *Public Enterprise and Privatization*. Boulder, CO: Westview Press.

Starr, Paul. 2015. "How Gilded Ages End." *The American Prospect*. Retrieved Dec. 20, 2015 (http://prospect.org/article/how-gilded-ages-end).

Stewart, James B. 2012. "Tax Me If You Can". *The New Yorker*. Retrieved Nov. 17, 2015 (http://www.newyorker.com/magazine/2012/03/19/tax-me-if-you-can).

Tilly, Charles. 1990. *Coercion, Capital, and European States, A.D. 990–1990*. Cambridge: Blackwell.

Varner, Charles and Cristobal Young. 2008. "Gov. David Paterson should call millionaires' bluff on tax flight." *New York Daily News*. October 26.

Young, Cristobal and Charles Varner. 2013. "State Millionaire Taxes." Pp. 149-60 in *Occupy the Future*, edited by D. Grusky, D. McAdam, R. Reich, and D. Satz. Cambridge, MA: MIT Press.

Young, Cristobal, Charles Varner, and Douglas S. Massey. 2008. *Trends in New Jersey Migration*. http://leg.state.vt.us/JFO/Tax Commission/Trends in NJ Migration Study - Princeton.pdf.

Weeden, Kim A., and David B. Grusky. 2014. "Inequality and Market Failure." *American Behavioral Scientist* 58(3):473-491.

Wuthnow, Robert. 2013. *Small-Town America: Finding Community, Shaping the Future*. Princeton, N.J.: Princeton University Press.

Chapter 2. Millionaire Migration in California:

The Impact of Top Tax Rates

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Key words: taxes, fiscal policy responsiveness, migration

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Summary

Do higher tax rates induce migration? The literature suggests that migration responses to taxation are constrained by the social and economic considerations that predominate in the migration decision. However, the very top of the income distribution constitutes an important test case. Barriers to migration are lower for the rich, which suggests that even small changes in top tax rates might cause migration. When lower-tax regions are nearby and not separated by closed borders (as is the case across E.U. countries and U.S. states), millionaire tax flight threatens governments' ability to effect greater tax progressivity, even though voters may prefer such a policy. Thus, the empirical extent of tax migration by the rich has important ramifications for state fiscal policy and, consequently, for the level of inequality that obtains in society.

Drawing on a complete 18-year panel of all tax filers in California, we test how changes in top tax rates affect millionaire migration into and out of the state. Administrative tax records provide a full census of top earners, and as such, offer to transform sociological and demographic understandings of the elite. California is one of eight states that have established a "millionaire tax" in recent years. The popular appeal of these taxes is that they raise revenue from those seen to have greater ability to pay a higher rate on the highest portion of their incomes. The concern, however, is that millionaire taxes may lead to millionaire migration, with potentially serious loss of revenues for the state.

This study addresses the following key question: Do changes in California's top income tax rates lead to changes in the migration of top incomes? There is limited existing evidence on the effect of top state tax rates. Available data sources such as the

census or the IRS migration files do not provide data specific to people with top incomes. However, California income tax records provide a virtual census of millionaires, and show when millionaires enter or exit the state. These data offer a unique contribution to the policy discourse on state taxation of top incomes.

This study tracks migration by, in essence, identifying taxpayers who file a California full-year resident tax return in one year and file a part-year / nonresident return in an adjacent year. We calculate the rates of in-migration and out-migration as a percentage of population for different income groups over the period 1994 – 2007. We then compare migration patterns before and after two recent California tax law changes.

The main focus of this study is the introduction of the Mental Health Services Tax in 2005 ("2005 MHST"). This tax is levied at a rate of 1 percent on amounts of taxable income greater than $1 million. Secondly, the study examines the effect of tax cuts in 1996 that applied only to high incomes – though at income levels much lower than $1 million (approximately $110,000, and $220,000). If arguments about tax-flight migration are correct, the 2005 tax increase should cause millionaire migration from the state, while the 1996 tax cut should lead to greater in-migration (or less out-migration) of high-income tax payers.

Our six central findings are as follows:

1. Migration is a very small component of changes in the number of millionaires in California. While the millionaire population sees a typical year-to-year fluctuation of more than 10,000 people, net migration sees a typical year-to-year fluctuation of 50 to 120 people. At the most, migration accounts for 1.2 percent of the annual changes in the millionaire population. The remaining 98.8 percent of changes in the millionaire

population is due to income dynamics at the top – California residents growing into the millionaire bracket, or falling out of it again.

2. Using difference-in-differences models, which compare migration trends of the group experiencing the tax increase to a group of high-income earners *not* facing a tax change, neither in-migration or out-migration show a tax flight effect from the introduction of the 2005 Mental Health Services Tax. In fact, out-migration has a "wrong-signed" estimate: out-migration declined among millionaires after the tax was passed (both in absolute terms and compared to the control group). In other words, the highest-income Californians were less likely to leave the state after the millionaire tax was passed.

3. Using an expanded definition of migration – the shift from resident to non-resident tax filer (i.e., not living in California but still earning some income in California), we continue to see no evidence of responsiveness to the MHS tax. This group is unexpectedly important: many high-income out-migrants do, in fact, continue to earn some income and pay some taxes in California. This group also shows the "wrong-signed" estimate for out-migration: this "partial" out-migration of millionaires fell – rather than rose – after the tax was passed.

4. The 1996 tax cuts on high incomes likewise had no consistent effect on migration. There was a small effect for those experiencing the small (0.7%) tax cut, but no effect at all for those experiencing the large (1.7%) rate cut. While we are planning to analyze the 1996 tax cut in greater detail, the overall picture is one of no clear effect.

5. There is a strong out-migration effect for high-income earners who become divorced. In the year of divorce, the migration rate more than doubles, and remains

slightly elevated for two years after the event. This shows that there are circumstances that do generate millionaire migration. The tax policy changes examined in this report are very modest compared to the life-impact of martial dissolution.

6. Most people who earn $1 million or more are having an unusually good year. Most "millionaires" earned less in years past, and they are not likely to earn this much again. A representative "millionaire" will only have a handful of years in the $1 million + tax bracket. The somewhat ephemeral nature of very high income is one reason why the top-income taxes examined here generate no observable tax flight. It is difficult to migrate away from an unusually good year of income.

Introduction

Since 2004, eight states have added new taxes on top incomes. These taxes have a notable impact on state budgets. In California, the 2005 Mental Health Services Tax ("MHST") raised the tax rate on income above $1 million by one percentage point. Although just 0.3 percent of California resident tax filers reported income of more than $1 million in 2005, these filers accounted for 21.3 percent of taxable income among resident tax filers and 36.5 percent of the income tax paid by resident filers.[1] Table 1.1 shows the new revenues generated by the MHST. In 2005, it raised $1.3 billion, or roughly 2 percent of all income tax revenues and 1 percent of all state tax revenues.

Table 1.1 California revenues from Mental Health Services Tax

Tax year	$Billions
2005	1.3
2006	1.3
2007	1.5
2008	1.0
2009	0.7
2010	1.0
2011	1.0
2012	1.6
2013	1.2
Annual Average	1.2

Source: Franchise Tax Board Annual Reports.

Can states sustain these new revenue sources without losing tax filers at the top of the income distribution? Theoretical concerns have been raised about migration response to state-level progressive income taxes (Feldstein and Wrobel, 1998). Higher taxes

[1] Source: Franchise Tax Board, 2006 Annual Report, p. 82, https://www.ftb.ca.gov/Archive/AboutFTB/annrpt/2006/2006AR.pdf.

suggest the possibility that a cheaper social contract may be had elsewhere, in a lower-tax state. However, existing research shows that residential tax arbitrage of this sort is *not* an important component of migration behavior. The proximity of income-generating jobs and social networks remains paramount, even within commutable regions that span multiple tax jurisdictions (Day and Winer 2006; Coomes and Hoyt, 2008).

For the rich, however, returns to human capital may be one of several potential income sources. In addition to wage and salary income, some millionaires may rely on capital sources of income. To the extent that the act of drawing income from these sources is not tied to a particular place, such "capitalists" may face fewer geographic mobility constraints, and as such, their residential decisions may depend relatively more on the tax price of a given jurisdiction.

On the other hand, the rich may be quite immobile. Positions in the most highly-skilled and most highly-remunerated professions are concentrated in particular places. Consider technological expertise in Silicon Valley or financial expertise on Wall Street. The agglomeration economies in these regions are important considerations for state fiscal policy (Baldwin and Krugman 2004). To be sure, there are top-income earners who do not depend on labor income. Yet members of this group will have invested significant economic and social resources in a particular place in order to make their fortunes (Glaeser and Gottlieb 2009). Yet even they may be quite reluctant to move away from a world of localized social capital that is more likely to transfer into future income-generating opportunities.

1.1 Regional tax regimes in an expected utility theory of migration

Neoclassical economic theory suggests that people move when expected utility in their current residence falls below expected utility somewhere else, plus the costs of getting there. Clearly this simple cost-benefit analysis is not the only explanation for human migration. But as Douglas Massey and colleagues (1993) make clear, utility maximization is consistent with broader system logics of migration, such as those proposed in core-periphery theories (Castells, 1989; Sassen, 1988). In short, the paradigm remains an intuitively appealing and empirically tractable framework for the complex residential decision-making of individuals and households.

Taking utility as the sum of consumption and leisure, the migration decision then turns simply on a comparison of wage opportunities in potential residences. The simple model is generalizable. Greenwood (1997:670) points out that the neoclassical approach evolved in response to persistent wage differentials across regions, leading to a more flexible model:

$$PV_{ij} = \sum_{t=1}^{n}\left[\frac{1}{(1+r)^t}\right][(E_{jt} - C_{jt}) - (E_{it} - C_{it})] \qquad (1)$$

where place-*i* residents move to place *j* when the present value of the migratory "investment" (earnings *E* net of costs *C* expected at *j* minus the net earnings expectation at *i*) is positive. Although migration research in this tradition has concentrated on expected human capital returns—*E* in Sjaastad's (1962) sense—rather than expected costs, *E* did eventually incorporate other aspects of utility, including public goods and climate. These place-specific "amenities" were viewed, in the early literature, as merely

compensating for regional wage differences (Charney 1993; Graves 1979; Greenwood 1997). Empirically, taxes seem to have minimal effects on residential choices (Coomes and Hoyt 2008; Liebig, Puhani, and Sousa-Poza 2007). Thus, for most migration decisions, models that include taxes may add little to a more narrowly defined human capital model.

But taxes may be consequential for wealthy households. In absolute terms, the wealthy pay more taxes. They may also be able to "time" income and more easily withstand any interruption of earnings associated with an interstate move. Indeed, the potential tax effect on migration is at the center of a largely separate literature on regional tax competition. Mirrlees (1982:322) enters the tax price of residential location in the utility function

$$v(n) = u(x(n), n) \tag{2}$$

where utility *v* derived from a given level of productivity *n* is adjusted by the tax rate *x*. Though the standard model (1) implicitly equates earnings with productivity, (2) makes the price of residing in a tax jurisdiction explicit: Earners' consumption is limited to after-tax income *x(n)*. Faced with high tax costs, the wealthy may simply move elsewhere. The threat of greater migration responsiveness among the wealthy suggests a policy tradeoff between the "millionaire taxes" that are often popular with voters, and the loss of wealthy tax filers. If millionaires are in fact more mobile, state policymakers may be forced to "curse" the less-mobile middle with the largest tax bills (Simula and Trannoy 2011).

However, the presumption that exceptionally skilled, moneyed, and entrepreneurial individuals are also exceptionally mobile is debatable. Certainly, some

millionaires do have the luxury of greater mobility, and recent studies verify Mirrlees' (1982) proposition in specific cases. For example, Kleven, Landais, and Saez (2010) show that European football stars prefer to play for teams in countries with lower tax rates. Yet, as the authors note, professional sport requires minimal place-specific investment of human capital. In fact, the game itself moves around, often across international borders. Kleven et al. (2010) provide an important upper bound estimate on the migration responsiveness of the highly skilled. Nevertheless, their estimated tax-elasticity of residential location is still only 0.4, suggesting that place considerations are significant even for the most mobile top-income earners.

The above models have not included the relational value embedded in the social network. In this study, we infer the following. If the rich do not move (much) in response to tax changes, then something must be keeping them in place. We suspect this is the implied value of social capital in the network.

1.2 California Income Tax Rates

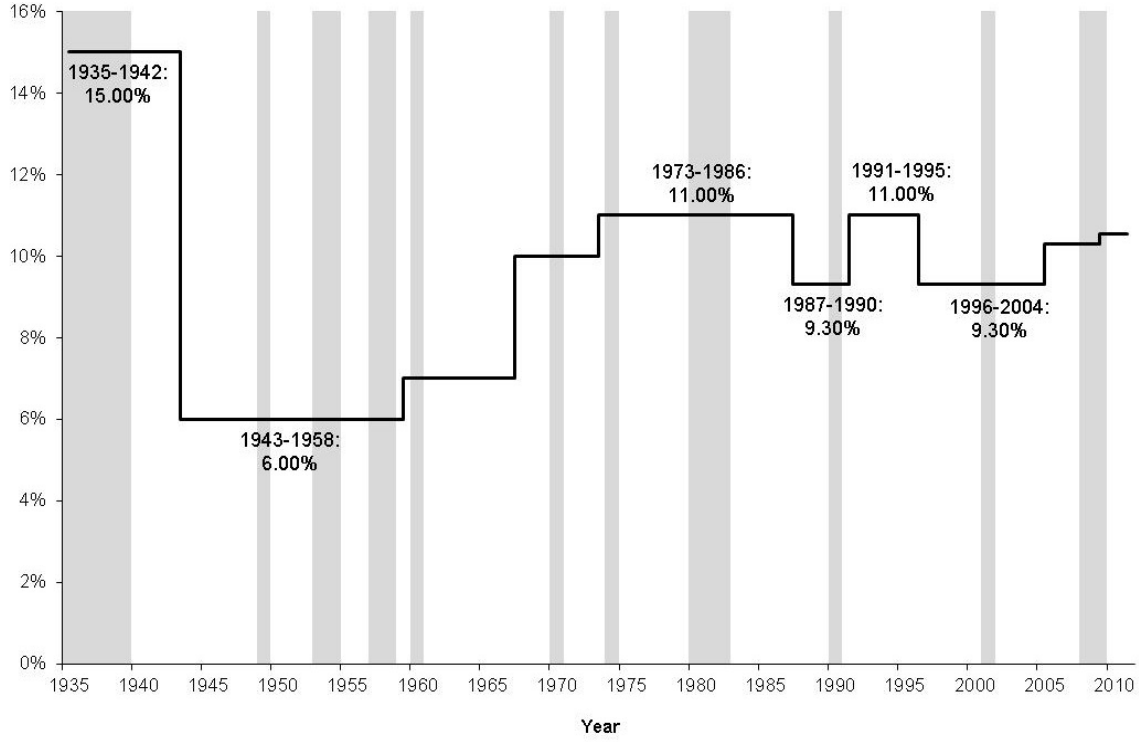
In California, the personal income tax rate structure has changed frequently. California first collected a personal income tax in 1935. The rate schedule was progressive, starting at 1 percent on income below $5,000 and adding several 5- and 10-thousand dollar brackets up to $80,000. There were four brackets on top incomes, adding 1 percentage point increments up to a 15 percent top marginal rate on income above $250,000.

Since 1935, the top marginal rate has changed 9 times, with 6 increases and 3 cuts. Figure 1.1 places these changes in economic context. It shows the top marginal tax

rate against the backdrop of the business cycle, with recessions indicated by the shaded columns. The largest tax cut—9 percentage points—came in 1943, on the heels of a federal income tax hike. The rate cut was also accompanied by a reduction in the number of brackets, which topped out at $30,000 starting in 1943. Rates increased again in 1967, but the number of brackets remained essentially unchanged until 1991, when two top-income brackets returned. Most changes take effect between recessions. However, there are two crucial exceptions. The largest top rate change in history—a 15 percentage point increase—occurred when the income tax was first established—in the middle of the Great Depression. Then, in 2009, California added a 0.25 percentage point surcharge on income above $1 million, in the middle of the Great Recession.

Figure 1.1 indicates that the California top bracket is not stable and that rate changes are unpredictable. Given the top rate volatility over time, top-income earners would have uncertainty regarding how long any particular rate will remain in effect.

Figure 1.1 California top marginal tax rate, 1935–present



In this chapter we analyze two specific tax policy changes. Figure 1.2 (below) shows the rate schedule before and after the 2005 Mental Health Services Tax came into effect. In November 2004, voters approved Proposition 63, which added 1 percentage point on income above $1 million effective January 1, 2005. Before this, marginal rates were progressive at low and middle income levels, but only up to about $40,000 for single filers or $80,000 for joint filers. Between 1996 and 2004, the marginal rate was the same (9.3 percent) for the top one-fifth of all income earners. Since the 2005 increase, income earners at the very top have paid 10.3 percent on income above $1 million.

Figure 1.2 The 2005 Mental Health Services Tax ("2005 MHST")

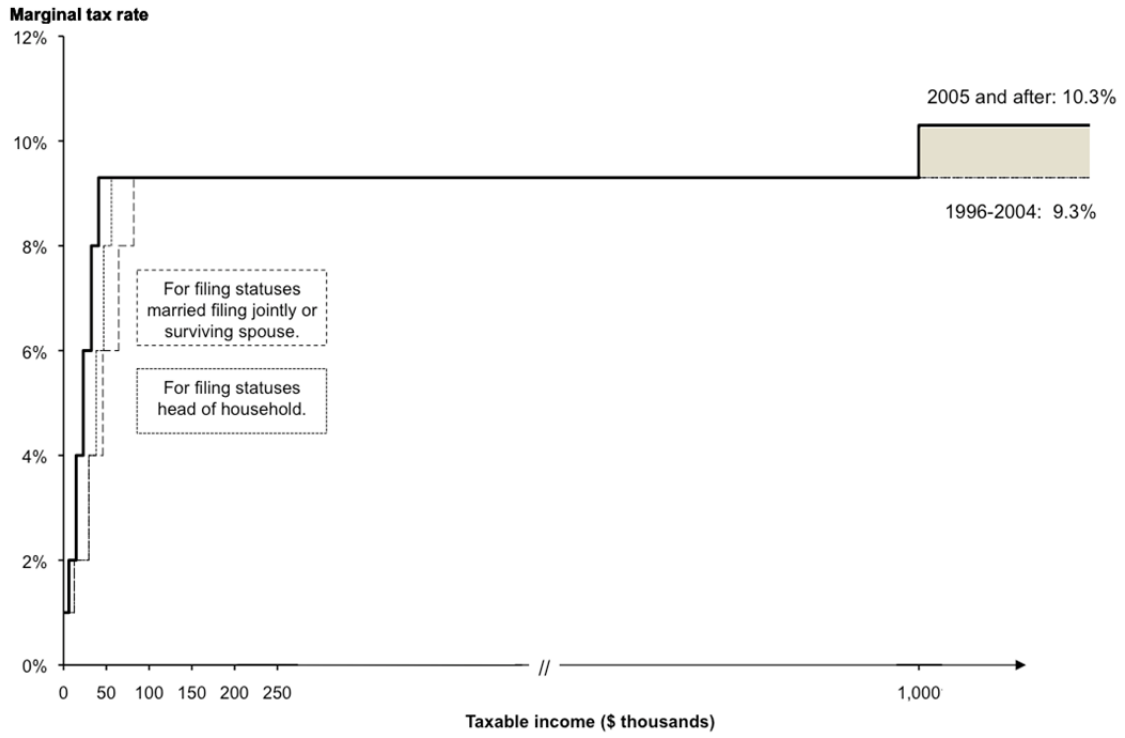
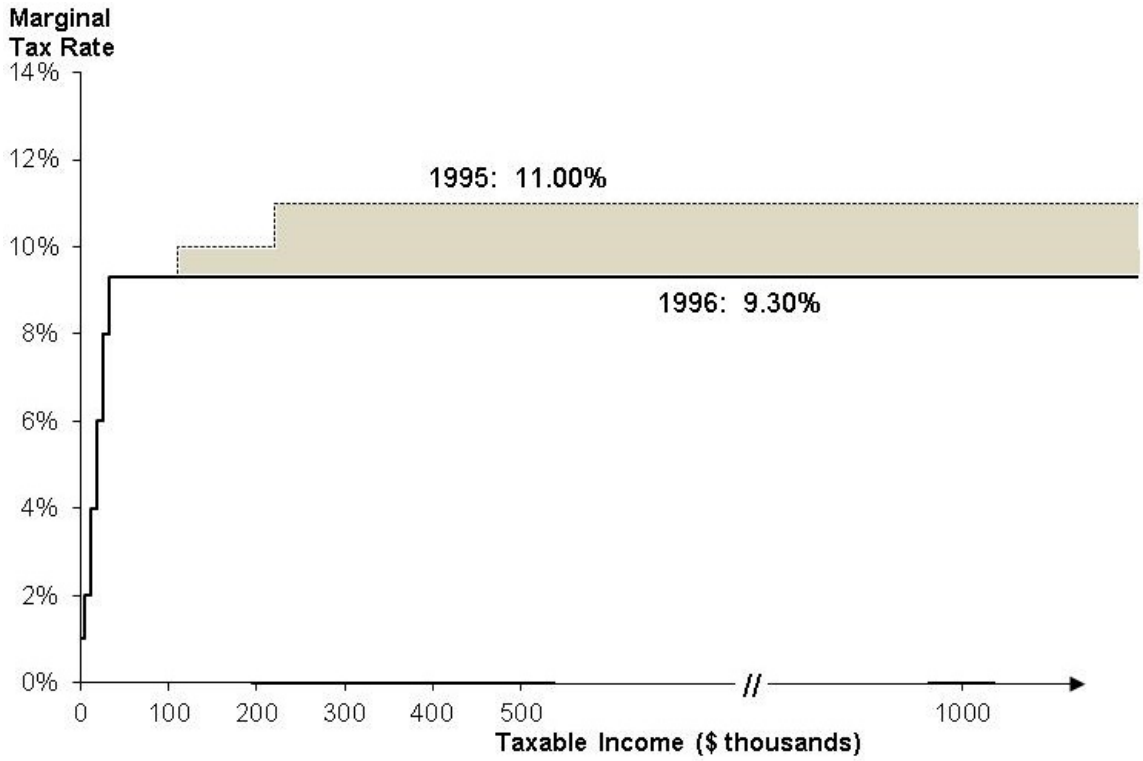


Figure 1.3 (below) provides a similar picture for the 1996 tax cuts, which returned the top marginal rate to its 1990 level. One important difference is that the 1996 changes applied to a much wider income range. The 1996 changes were not "middle class tax cuts," but any single filer above $109,936 or joint filer above $219,872 received a tax cut.

Figure 1.3 The 1996 Tax Cuts



Note: Brackets shown are for single filers. Brackets were doubled for joint filers.

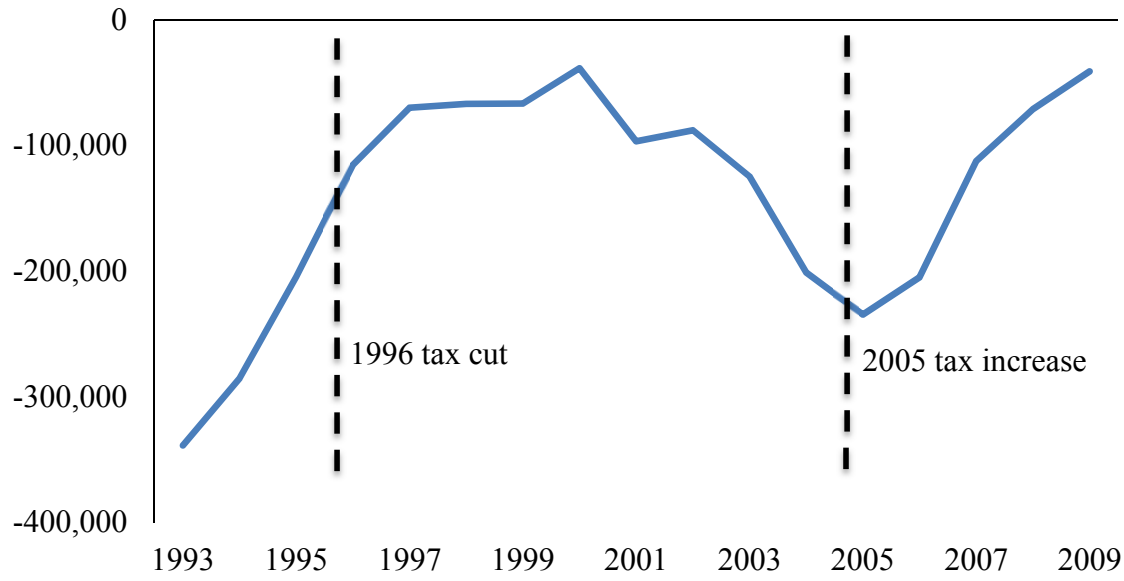
1.3 California Migration Trends

As the U.S. population has shifted away from the postwar industrial centers, states like New Jersey and now California are seeing a plateau in population growth. Some have suggested that higher taxes in these states are to blame. Figure 1.4 graphs the net migration flow between California and the rest of the country since 1993. During this period, California's domestic migration has fluctuated around an average net outflow of -139,000 people per year moving to other states. This is not a large outflow relative to the state's population. Based on the current population of 38 million, the net migration rate is

only -0.4%. Nevertheless, as Figure 1.4 shows, it is clear that migrants leaving for other states outnumber domestic migrants arriving in California.

The net domestic migration trend closely tracks the California business cycle. California lost slightly fewer people as the economy expanded in the 1990s, then lost slightly more after the dot-com bubble burst. Since the MHST came into effect in 2005, net migration has risen again. Thus, it appears that after the MHST, more people are moving into California. This seems to contradict the claim that tax increases lead to more migration.

Figure 1.4 California net domestic migration, 1993–2009



Source: IRS.

Yet, it is important to note that the trend in Figure 1.4 is drawn from Internal Revenue Service data for the entire population. The IRS data set does not provide income-specific migration counts. The IRS has also pointed out that their state-to-state

migration data contain very poor coverage of top-income earners. Specifically, the IRS data do not include late filers. These late filers—about 2 to 5 percent of all filers—"are likely to have complex returns that report relatively high income, and so the migration data set may under-represent the very wealthy" (Gross, 2003:4). Thus, even if it were somehow possible to disaggregate by income, the IRS data would not offer a representative sample of high incomes or answer the question of what impact top tax rates have on millionaires. In contrast, the FTB data we analyze in this chapter provide a virtual census of high incomes in California.

1.4 California's Wealthy Population

Did the 1996 and 2005 tax policies alter California's ability to attract the wealthy? The basic face validity test on overall net migration trends showed no evidence for a tax effect, but top-income tax filers may be different. If they are different—and if tax rates are important factors in their state residency decisions—we would expect to find two patterns in California's wealthy population. The number of top-income earners would fall after a tax increase and rise after a tax cut.

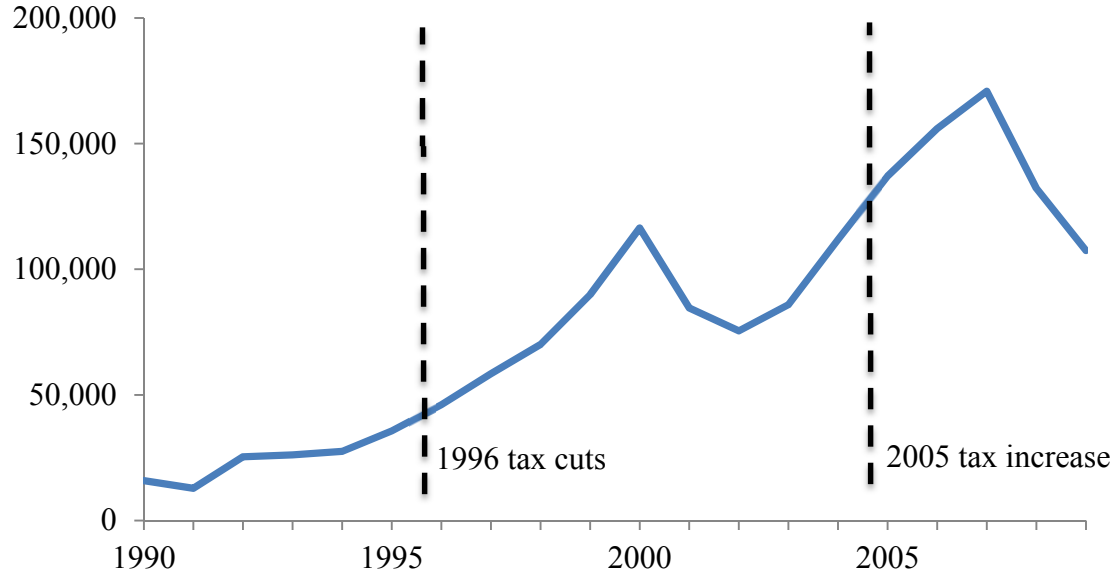
Figure 1.5 (below) shows the number of millionaires in the California tax data since 1990. The millionaire population grew from 15,000 in 1990 to more than 150,000 in 2007.[2] Neither of the tax changes we study has any perceptible effect on the general upward trend in California's millionaire population. After the MHST came into effect, the number of millionaires continued to rise for three years, falling only during the 2008

[2] These counts include all California residents and nonresidents who had income greater than $1 million.

financial crisis. This pattern does not indicate that the recent tax changes were of major concern to top-income earners.

If the population of top-income earners were determined mostly by tax rates, the basic population graph could be quite informative. However, population changes for other reasons. The strength of financial markets is critical, with the two peaks in Figure 1.5 corresponding to the dot-com boom (1999-2000) and the more recent stock market run-up (2007-08). These economic trends greatly increased the number of Californians earning very high incomes. Analytically, other drivers of the top-income population (particularly income growth) overshadow migration, which occurs on a smaller scale.

Figure 1.5 Number of Millionaires Filing California Tax Returns, 1990–2009



Source: FTB.

Thus, though the net migration and millionaire population trends indicate that the tax changes had no effect on California's attractiveness to the wealthy, we need to

examine migration data for top-income earners in order to identify any potential tax effect on migration. It is this analysis to which we turn now. The rest of the chapter has four sections. Section 2 defines migration events in the FTB data and illustrates the intuition guiding our difference-in-differences model. Section 3 provides the main results for the 2005 MHS tax, as well as basic results for the 1996 tax cut. Section 4 contains extensions and robustness tests. Section 5 concludes.

Data and Identification Strategy

The available national data on migration can tell us almost nothing about top-income migration responses to taxation. Instead, we turn to a California Franchise Tax Board data set that offers full coverage of top incomes. Administrative data collected by state tax departments have unique value for the study of top-income migration behavior. For this study, the California Franchise Tax Board (FTB) granted us access to tax records. Using data from California personal income tax returns, the FTB created data sets for the tax years 1992–2009. Resident tax returns (Forms 540, 540A, 540EZ, and 5402EZ) and part-year / non-resident tax returns (Forms 540NR Long and 540NR Short) were included.

FTB then conducted three data processing steps necessary for the creation of a reliable longitudinal data set. First, because it is possible to file a tax return for a tax year other than the filing year, it was necessary to transfer the information from these returns to the appropriate tax year. Second, for each tax year, data on joint filers was replicated. The designation of the primary and secondary filers was switched on the replicated record. Third, the replicated tax year datasets were merged to create a panel dataset. This

method creates an observation with time series data for each adult taxpayer regardless of changes in marital or filing status. After perfecting the data set, FTB removed identifying information such as names and SSNs from the data file to preserve taxpayer confidentiality.

The data set we received from FTB provides a virtual census of high-income earners, with information on income, taxes paid, and some limited demographic data reported on a standard tax form (such as marital status). Our analysis of the 2005 Mental Health Services Tax includes the filing history for any filer who reported annual adjusted gross income above $500,000 at least once in the FTB data. There is an average of 750,000 records per year, giving roughly 13.5 million records in total.

2.1 Migration Definitions

In this section, we discuss how migration is defined using the FTB data. Individuals in the tax data can have one of three basic filing statuses in any given year:

F = Full-year resident tax return

P = Part-year / non-resident tax return

M = Missing (no tax file)

We add subscripts to the notation to indicate the year relative to the reference year. So, if the reference year is 2004, then subscript -1 means 2003, 0 means 2004, and +1 means 2005.

In-Migration

Three year definition: $MPF = M_{-1}P_{0}F_{+1}$

Four year definition: $MMPF = M_{-2}M_{-1}P_{0}F_{+1}$

This definition of in-migration refers to the following sequence of tax filing: no taxes filed, M_{-1} (or $M_{-2}M_{-1}$for two years of non-filing), then a part-year return in the reference year (P_0), then a full-year return (F_{+1}). Though these individuals file their first full-year resident return in year +1, they arrived in California in the reference year 0.

Out-Migration

Three year definition: $FPM = F_{-1}P_0M_{+1}$

Four year definition: $FPMM = F_{-1}P_0M_{+1}M_{+2}$

This is the opposite sequence from in-migration: beginning with a full-year resident return (F_{-1}), in the reference year a part-year return is filed (P_0), followed by no further tax filing (M_{+1}), confirmed by $M_{+1}M_{+2}$.

We use four-year definitions to ensure that an incidence of M is not error. A tax filer could be missing either because they were not in the state, or because their tax return was miscoded in a given year.[3] In the latter case, even though the individual filed taxes and remains in California, they would appear to have migrated. Using two years of absence, in our view, identifies individuals who have truly migrated (rather than having been misplaced in the tax data for a year).

[3] It is also possible that their income fell below the requirement for filing state income taxes in a given year. This should also not be confused with migration.

2.2. Supplemental Migration Definitions

It is also possible that migration occurs without an episode of filing a part-year return. Some people who migrate very close to the beginning or end of the year, for example, will not be required to file a part-year return. Such individuals will simply disappear from the tax records. To measure this, we examine supplemental definitions of "migration", for individuals who simply shift from full-year filers to not filing at all:

In-Migration (supplemental definition): $MMFF = M_{-2}M_{-1}F_{0}F_{+1}$

Out-Migration (supplemental definition): $FFMM = F_{-1}F_{0}M_{+1}M_{+2}$

These supplemental "migration" definitions include "births" into the tax system, and more problematically, deaths. Filing for a time and then disappearing from the tax records is exactly the filing sequence of individuals who die.[4] In our data, we observe 70,000 instances of sudden (FFMM) "out-migration," which is roughly the number of deaths we expect to find for these income groups over this time period. Thus, we believe the supplemental definitions largely do not capture migration behavior. As a further check, we have matched these potential migrations with the FTB list of deaths and are preparing a new analysis of "FFMM" migrations that exclude known deaths from the migration definition.

[4] This is also the pattern of a migrant who moves at the turn of the calendar year (i.e., by moving on December 31 / January 1).

Table 2.1 Comparison of Migration Definitions

Core Definition	**In-Migration**			**Out-Migration**		
3-year	mpf	90,230	100%	fpm	51,336	100%
4-year	mmpf	81,676	91%	fpmm	41,918	82%
	Not mmpf	8,554	9%	Not fpmm	9,418	18%
Supp. Definition						
3-year	mff	185,792	100%	ffm	164,558	100%
4-year	mmff	80,985	44%	ffmm	70,751	43%
	Not mmff	104,807	56%	Not ffmm	93,807	57%

Note: The four-year in-migration rates are available up until 2008, though the out-migration rates (which require two "forward" years) are only available to 2007. Likewise, although the current data set goes back to 1992, in-migration requires two lag years to observe, so our earliest year of in-migration rates is 1994.

2.3 Identification Strategy

How does one identify the effect of a millionaire's tax on migration? We use two complementary strategies. First, we look simply at annual migration rates for treatment and control groups. The treatment group is composed of individuals who earn enough to place them inside the tax bracket – i.e., people who pay more under the new tax rate. For the 2005 MHS tax, the treatment group is individuals who earned at least $1 million per year after 2004. The control group is high-income individuals who are not subject to the tax rate. We define the control group to be those earning $500,000 to $1 million per year.

There may well be differences in the migration rates between the treatment and control group. This is acceptable, since we are looking for a divergence between these groups' migration rates that occurs after the tax was introduced. Thus, we do not require that the treatment and control groups have the same baseline migration rates. We simply expect that the tax creates a new difference between the groups after 2005. Specifically,

the net migration rate should increase for those affected by the tax relative to those in the control group.

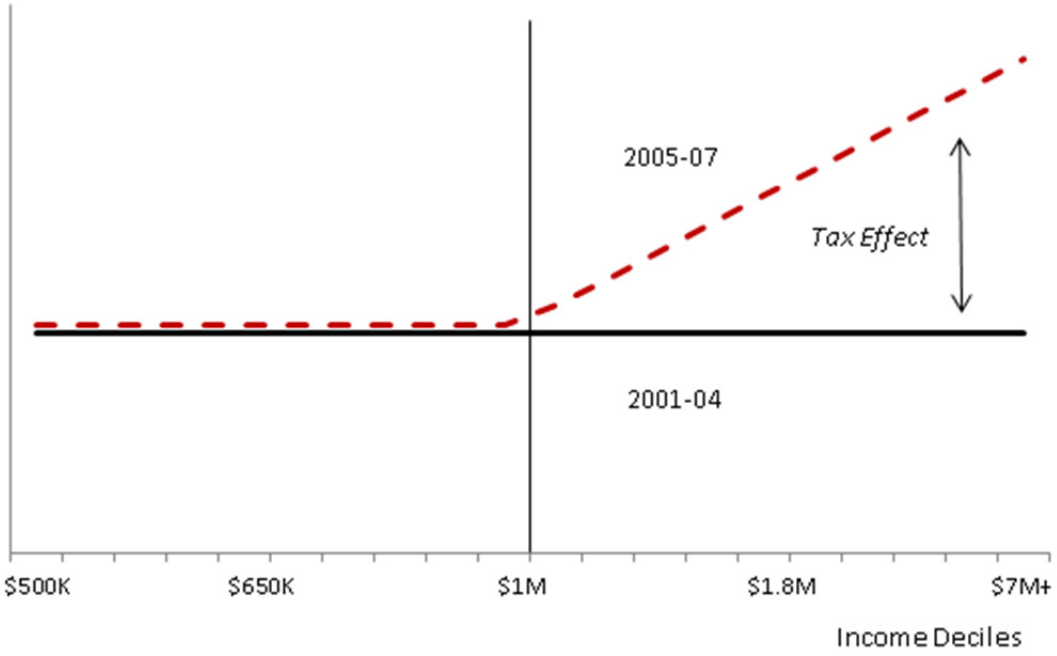
The principal purpose of the control group is to capture (non-tax) social, political, and macroeconomic trends that affect the migration behavior of top-income earners. The effect of the tax specifically is observed by a new increase in net migration among the treatment group, but not among the controls.

Our second identification strategy takes into account the marginal rate structure of the tax. Our first analysis treats the tax as if it were a lump sum fee that falls equally on all individuals with more than $1 million in income. However, with a marginal tax rate, all income below $1 million is exempt from the higher rate. The new rate only applies to earnings above $1 million. Thus, for individuals earning $1,000,001, their tax increase is 1 penny. For those making $10,000,000, their tax increase is $90,000. The magnitude and the effective rate of the tax hike grows with the amount earned above $1 million. Thus, we not only expect a net migration response for the treatment group relative to controls. We also expect that any effect of the tax hike would grow with income in the treatment group.

If the tax were to have an effect on migration, Figure 2.1 illustrates the change we would expect, by detailed income levels. (Using real data, we break up the control and treatment groups into income deciles; the income levels depicted here reflect our income deciles.) The solid line shows the income-migration profile for the pre-tax years, depicted here as completely flat: as income grows, out-migration rates remain constant. The dashed line shows the income-migration profile in the three years after the tax was passed. On the left-hand side of the graph, we see that migration rates were unaffected for

those earning less than $1 million. The right-hand-side shows a steadily increasing out-migration rate. This reflects the fact that those in the treatment group with the highest incomes experienced the largest tax increases – both in dollar terms, and in their effective tax rate.

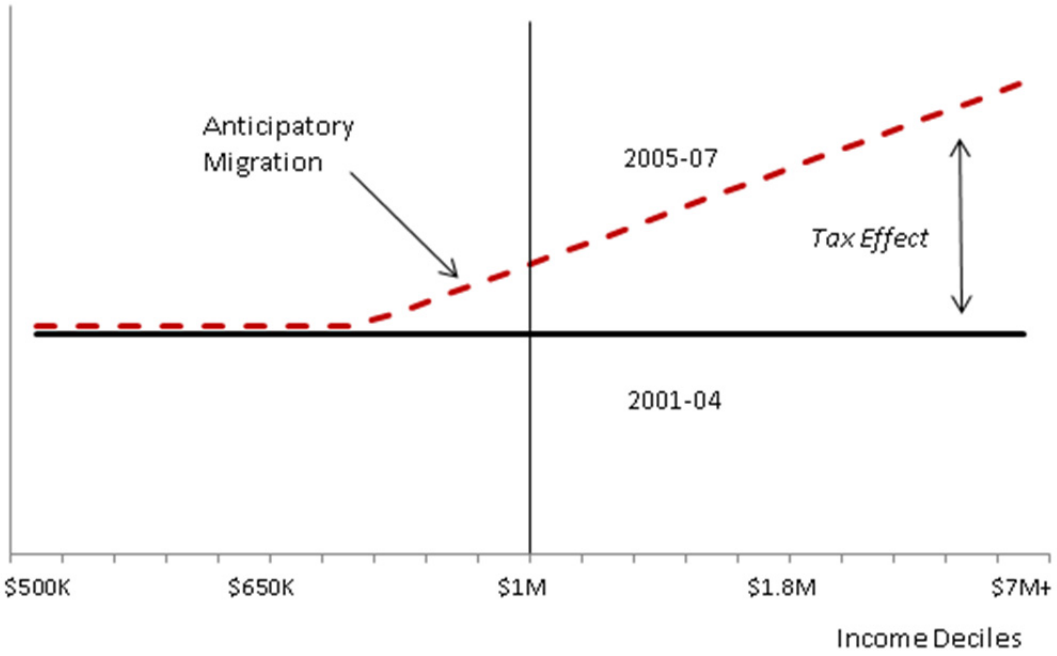
Figure 2.1 Expected Effect on Out-migration Rates after the 2005 MHST



One criticism of this design is that there may be some anticipatory migration by people just below the tax bracket. Suppose that people in the control group anticipate future income growth, and migrate in response to the new tax, even though they are not yet affected by it. Such anticipatory migration should be readily observable in our analysis. It simply means that migration rates begin to increase at incomes below the $1 million bracket. The highest earners of the "control group" believe that they are better

understood as being "treated" by the tax (not yet, but very soon). Figure 2.2 shows a pattern of anticipatory migration.

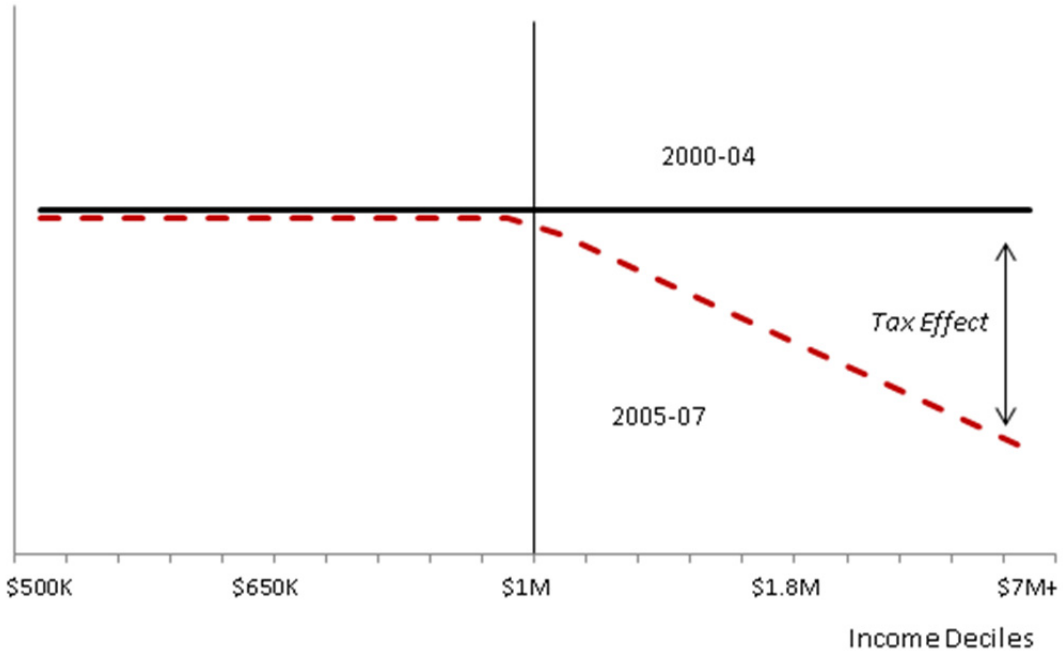
Figure 2.2 Expected Out-migration Effect, with Anticipatory Migration



For in-migration, the prediction is that the tax increase will reduce in-migration rates among those exposed to the tax. So, in Figure 2.3 (below) the pre-tax period (2001-04) provides baseline migration rates, represented by the solid flat line. The figure assumes that in-migration rates are constant as income increases, but the analysis can accommodate any income-migration profile. In the post-tax period (2005-07) migration rates should not be affected for incomes below $1 million; for higher incomes, in-migration rates should be declining, and the effect should grow stronger as more and more income is subjected to the higher tax rate. In other words, above $1 million, in-

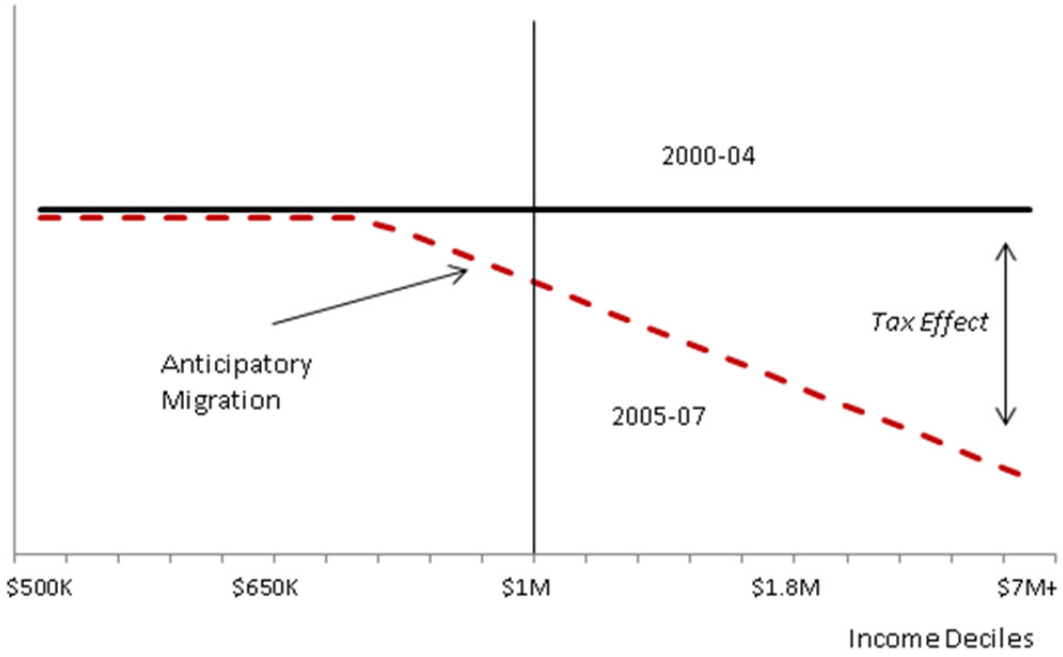
migration rates should start dropping as income increases (as illustrated by the dashed line).

Figure 2.3 Expected Effect on In-migration Rates, after the 2005 MHST



And finally, for in-migration, any anticipatory migration effects would be observed in much the same way as for out-migration (see Figure 2.4). In the post-tax period, some high-income earners in the control group would anticipate growing into the higher tax bracket, and decide not to move to CA before this happens.

Figure 2.4 Expected In-migration Effect, with Anticipatory Migration



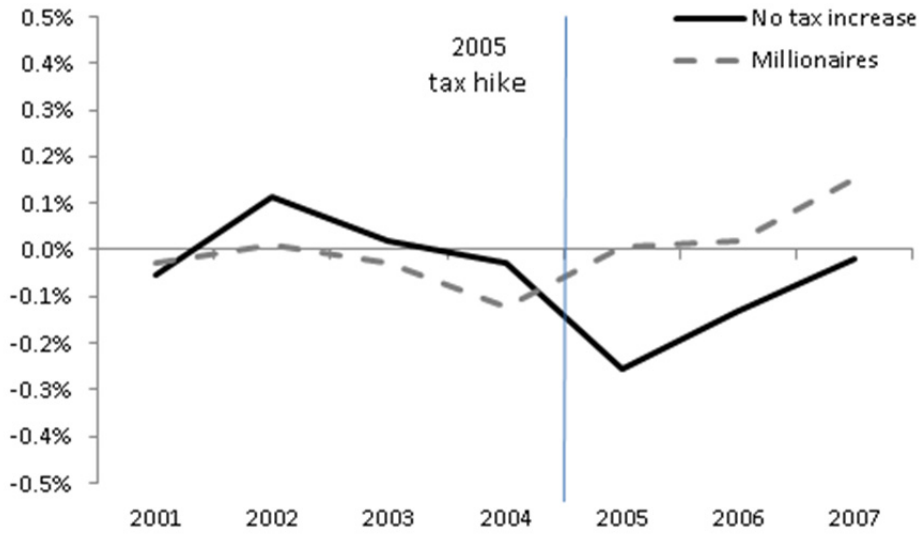
Results

In this section, we describe the results of our analysis. First, we examine the 2005 Mental Health Services Tax. We show the migration rates of millionaires before and after the tax, and compare these rates to the migration rates of high-income earners who did not pay the tax. Then, we show how the conclusions we draw from our main MHST analysis apply to another tax change: the 1996 tax cuts.

3.1 The 2005 Mental Health Services Tax

As a first analysis, we examine the net migration rates of people exposed to the new tax (those making $1 million +) compared to the control group of high-income earners not subject to the tax (those earning $500,000 to $1 million).

Figure 3.1 Net Migration Rates, Treatment and Control Groups, 2001-07



Source: FTB Microdata. N = 1,148,694

This analysis shows that in the years after the tax took effect, net migration for the treatment group (those exposed to the tax) increased relative to migration rates for the control group. The magnitude of difference is very small. Nonetheless, net migration of millionaires turned positive, while net migration of half-millionaires turned negative in the years after the tax. A reasonable interpretation is that, for both groups, net migration was "zero-plus-noise" over the whole period. But from an accounting perspective, there was a gain in millionaires after the tax.

Table 3.1 shows the raw counts of base population, in-migrants, and out-migrants in each year, for both the treatment and control groups. One can see that the net migration counts (in particular) are very small relative to the base population.

Table 3.1 Population and Migration Counts, 2001-07

Control Group ($500k - $1M)

	Pop	In-mig	Out-mig	Net	Net Rate
2001	75,464	652	692	-40	-0.05%
2002	68,351	608	531	77	0.11%
2003	77,145	609	595	14	0.02%
2004	95,604	728	753	-25	-0.03%
2005	113,185	872	1161	-289	-0.26%
2006	124,452	948	1113	-165	-0.13%
2007	134,216	1035	1060	-25	-0.02%
Std Dev	24,109	160	242	114	
Min	68,351	608	531	-289	
Max	134,216	1,035	1,161	77	

Treatment Group ($1M+)

	Pop	In-mig	Out-mig	Net	Net Rate
2001	47,648	387	400	-13	-0.03%
2002	40,171	274	270	4	0.01%
2003	46,613	271	284	-13	-0.03%
2004	61,500	324	399	-75	-0.12%
2005	74,385	457	453	4	0.01%
2006	82,769	507	492	15	0.02%
2007	90,252	600	464	136	0.15%
Std Dev	18,087	115	81	59	
Min	40,171	271	270	-75	
Max	90,252	600	492	136	

The population of full-year resident millionaires has ranged from 40,000 to 90,000, while out-migration has ranged from less than 300 to about 500. Net migration has ranged from -75 to 136. One standard deviation in the population of millionaires is 18,000; the corresponding number for net migration is 81. Migration accounts for less than one-half of one percent of the variation in the number of millionaires in California.

To make this point more intuitively clear, Table 3.2 shows the annual change in the population of California millionaires, along with the annual change in the net migration of millionaires. The number of millionaires has gone up or down, on average, by 9,593 people a year. The net-migration of millionaires has gone up or down by 51 people.[5] Migration accounts for just one-half of one percent (0.5%) of the changes in the millionaire population.

Table 3.2 Millionaire Population Changes

	Change in Number of Millionaires	Change in Net Migration of Millionaires
2002	-7,477	17
2003	6,442	-17
2004	14,887	-62
2005	12,885	79
2006	8,384	11
2007	7,483	121
Average of Absolute Changes	9,593	51

Despite the limited importance migration plays for the size of California's millionaire population, the central goal of the analysis is to identify the responsiveness of migration to top tax rates. Next, we look at migration rates before and after the tax by detailed income group. We organize the control group into ten income deciles, and do the same for the treatment group. Table 3.3 shows the decile cut points for both the control

[5] Absolute changes ignore the signs (i.e., whether the population change was positive or negative) and focuses simply on the magnitude of typical year-to-year changes.

and treatment groups, and shows the in- and out-migration rates at each level. The only noticeable pattern here is that migration declines with income. Individuals at the very top seem to be more strongly attached to their current state than other slightly less wealthy individuals.

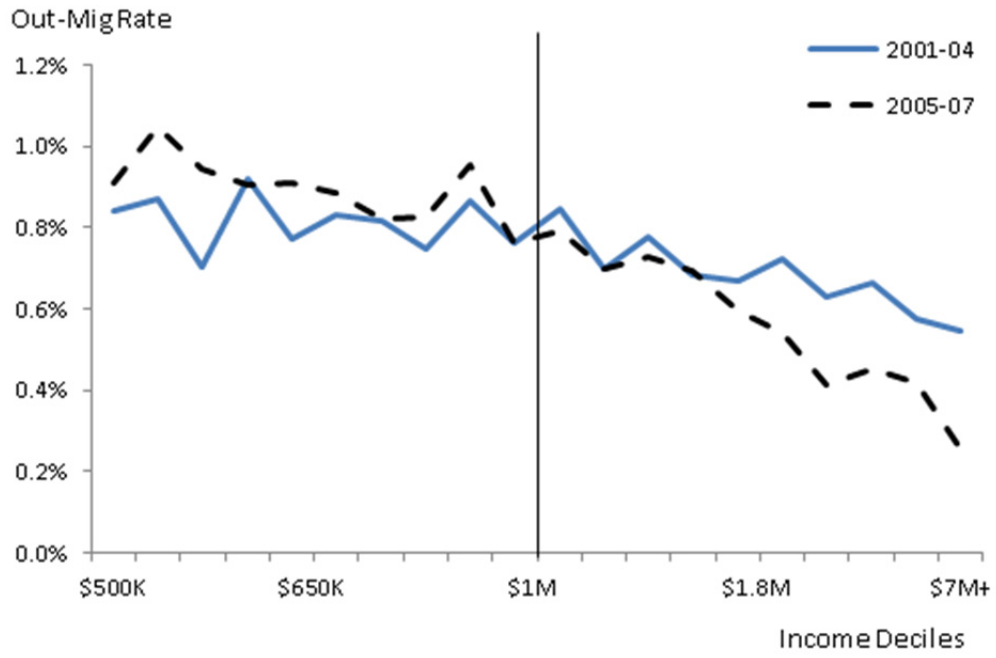
Table 3.3 Decile Definitions and Migration Rates

Decile Label	Greater than:	Less than / equal to:	In-migration rate		Out-migration rate	
Control Group			2001-04	2005-07	2001-04	2005-07
1	$500,000	$523,401	0.9%	0.8%	0.8%	0.9%
2	$523,402	$549,708	0.8%	0.8%	0.8%	0.9%
3	$549,709	$579,636	0.9%	0.7%	0.7%	1.0%
4	$579,637	$613,628	0.8%	0.9%	0.8%	0.8%
5	$613,629	$652,954	0.8%	0.9%	0.8%	0.9%
6	$652,955	$698,873	0.7%	0.8%	0.7%	0.9%
7	$698,874	$752,860	0.8%	0.6%	0.7%	0.8%
8	$752,861	$818,440	0.8%	0.7%	0.7%	0.7%
9	$818,441	$898,938	0.8%	0.8%	0.9%	0.9%
10	$898,939	$1,000,000	0.7%	0.6%	0.7%	0.8%
Treatment Group						
11	$1,000,001	$1,089,977	0.7%	0.7%	0.8%	0.8%
12	$1,089,978	$1,201,659	0.6%	0.6%	0.7%	0.6%
13	$1,201,660	$1,343,321	0.7%	0.7%	0.8%	0.7%
14	$1,343,322	$1,530,325	0.6%	0.6%	0.6%	0.7%
15	$1,530,326	$1,785,974	0.7%	0.8%	0.7%	0.6%
16	$1,785,975	$2,162,740	0.7%	0.6%	0.7%	0.5%
17	$2,162,741	$2,762,379	0.7%	0.6%	0.6%	0.4%
18	$2,762,380	$3,911,684	0.6%	0.5%	0.7%	0.4%
19	$3,911,685	$6,992,323	0.4%	0.5%	0.5%	0.4%
20	$6,992,324	> $1B	0.4%	0.4%	0.5%	0.3%

Recall that the tax flight argument anticipates increasing out-migration among the highest earners ($1 million+) after a tax increase. However, after the 2005 MHST, we

actually observe the opposite. Figure 3.2 shows that out-migration rates *decline more* among the highest earners in the post-tax period.

Figure 3.2 Out-migration Rates by Income, before and after the MHST.



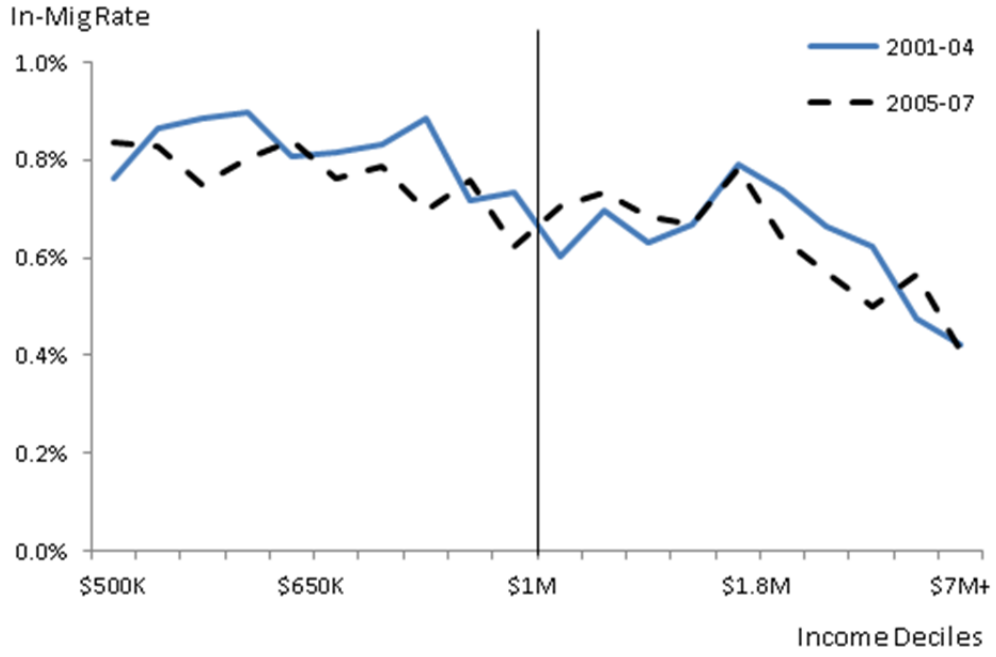
	Before	After	Diff
Control	0.8%	0.9%	0.1%
Treatment	0.7%	0.6%	-0.1%
Diff	-0.1%	-0.3%	-0.2%

The highest-income Californians were less likely to leave the state after the millionaire tax was passed. For the control group, the out-migration rate increased from 0.8% to 0.9%. This is shown on the left-hand side of the graph, with the dashed line (representing 2005-07) higher than the solid line (2001-04). For the treatment group (on the right-hand side of the graph), out-migration falls from 0.7% to 0.6%. The difference-in-differences estimate is calculated as the decline for the treatment group minus the

increase for the control group (which provides the counter-factual expected migration patterns had the MHST not come into effect). The DiD estimate is -0.2%.

In-migration follows the general pattern of decline with income: high-income individuals are less likely to be new in-migrants. (See Figure 3.3 below). However, the pattern is the same both before and after the passage of the MHST. Support for the tax flight argument would require declining in-migration among those exposed to the tax after it was passed. The simple DiD estimate is zero.

Figure 3.3 In-migration Rates by Income, before and after the MHST

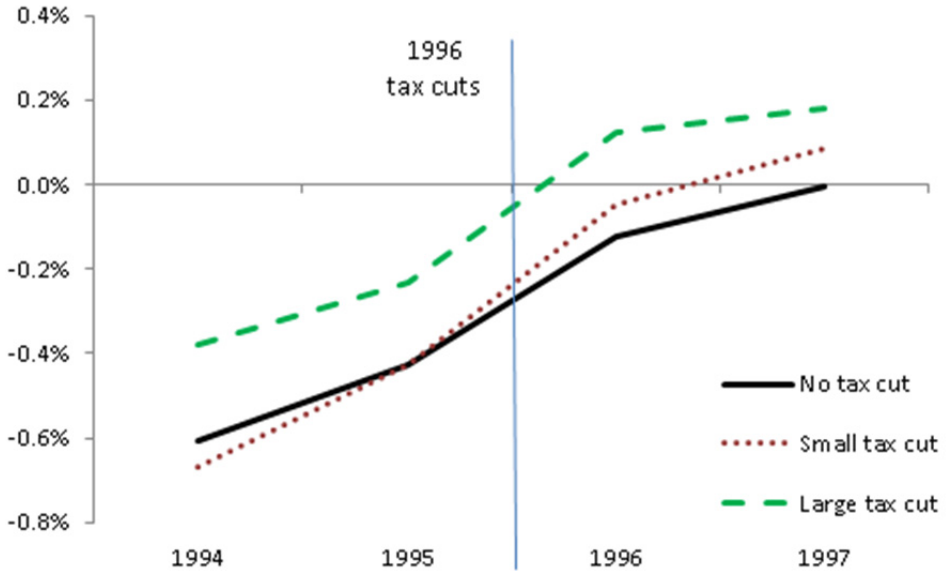


	Before	After	Diff
Control	0.8%	0.8%	-0.1%
Treatment	0.6%	0.6%	0.0%
Diff	-0.2%	-0.1%	0.0%

3.2 The 1996 Tax Cuts

Migration "non-response" to modest changes in tax policy is also relevant for policymakers considering tax cuts. Just as new top tax brackets do not drive millionaires to flee California or New Jersey (Young and Varner 2011), we do not expect tax cuts to influence top-income earners' state of residency. To test this expectation, we also use the California data to measure potential effects of the 1996 tax cuts on the migration of top-income earners. The 1996 tax cuts included two changes, a smaller 0.7 percentage point cut and a larger 1.7 percentage point cut.

Figure 3.4 Net Migration Rates, 1994-97



Source: FTB Microdata. N = 9,048,672

Figure 3.4 shows that net migration was trending positive for all groups during this period. These were economic boom times for California. Net out-migration was turning towards net in-migration.

The group with the small tax cut (dotted line) raised its net in-migration more than the control group (which received no tax cut). This is the expected effect for tax-induced migration (an increase in net in-migration following the tax cut, compared to the controls who did *not* receive a tax cut). In contrast, the group facing a large tax cut (dashed line) tracks the control group very closely, indicating no tax effect. The "large tax cut" group should have a growing divergence from the controls after 1995 – it should look like a stronger version of the small tax group. Instead, we see the opposite – the group with the large tax cut had a smaller (zero) response than the group with a small tax cut. These results indicate no consistent effect of the 1996 tax cut.

Table 3.4 shows the raw counts of base population, in-migrants, and out-migrants in each year, for both the treatment and control groups. Again, one can see that the net migration counts (in particular) are very small relative to the base population.

Table 3.4 Population and Migration Counts, 1994-97

Control Group ($80,000 to $106,899)

	Pop	In-Mig	Out-Mig	Net-Mig	Net Rate
1994	910,007	4,967	10,470	-5,503	-0.6%
1995	980,134	5,882	10,083	-4,201	-0.4%
1996	1,068,998	7,669	8,994	-1,325	-0.1%
1997	1,180,908	9,310	9,366	-56	0.0%
Growth	30%	87%	-11%		

Treatment Group 1 ($106,900 to $212,379)

	Pop	In-Mig	Out-Mig	Net-Mig	Net Rate
1994	716,401	7,133	11,917	-4,784	-0.7%
1995	808,737	8,654	12,097	-3,443	-0.4%
1996	936,001	10,740	11,190	-450	0.0%
1997	1,103,190	13,470	12,518	952	0.1%
Growth	54%	89%	5%		

Treatment Group 2 ($212,380 +)

	Pop	In-Mig	Out-Mig	Net-Mig	Net Rate
1994	220,915	2,129	2,963	-834	-0.4%
1995	260,204	2,903	3,505	-602	-0.2%
1996	307,368	3,913	3,530	383	0.1%
1997	373,597	4,743	4,066	677	0.2%
Growth	69%	123%	37%		

Table 3.5 shows the difference-in-difference estimates. Relative to the control group, net migration increased for the group experiencing the small tax cut, i.e. those earning between $106,900 and $212,379. However, the large tax cut did not increase net migration for those earning more than $212,379. Again, their trend mimics the control group trend.

Table 3.5 1994-97 Difference-in-Differences Estimates

Net migration

	Control	Small tax cut	Large tax cut	
1994	-0.6%	-0.7%	-0.4%	
1995	-0.4%	-0.4%	-0.2%	
1996	-0.1%	0.0%	0.1%	
1997	0.0%	0.1%	0.2%	
Before	-0.52%	-0.55%	-0.30%	
After	-0.06%	0.02%	0.15%	
Difference	0.45%	0.57%	0.46%	
DiD		0.11%	0.01%	-0.11%

Discussion and Analysis Checks

We found no observable effect of two California tax changes on the migration behavior of high-income earners. In this section, we consider whether these results might be sensitive to an alternative definition of migration. We also show, using a reverse placebo test, that the FTB data are capable of detecting migration responses to a well-established migration cause: divorce. Finally, we explain one reason why there is no migration responsiveness to the two tax changes we study here.

4.1 Sensitivity Analysis. "Partial" Migration

The main results consider migration events that are complete relocations from one state to another. The out-migrants defined above are full-year California residents before they move to another state and stop filing (and presumably owing) California taxes altogether (FPMM). Similarly, in-migrants had no previous economic attachment to CA before becoming full-year California residents (MMPF).

But interstate migration may also be partial in nature. For example, a full-year California resident can establish residency in another state but continue to earn (and pay tax on) California source income. This pattern may be common for top-income earners who can maintain second (or multiple) houses. These individuals may stay on with their current employer in an advisory or even permanent role, but live in California for only part of the year. Or, top-income earners may move away from California entirely but continue to take advantage of California income-generating opportunities.

Fortunately, the tax panel allows us to evaluate the sensitivity of our main results to this alternative migration mode. This is an important step in the analysis. "Partial

migrants" do not imply complete losses to California—they continue to pay taxes on their California source income. Nevertheless, one might expect greater tax responsiveness among members of this group. If a person is "jurisdiction shopping" for a lower income tax rate, it is probably less costly to purchase a second house in, say, Nevada, rather than completely sever economic and social ties to California. By partially moving in this way, one may escape CA taxation on investment income while still drawing California salary.

There are a large number of non-residents who file tax returns in California. These are people who, for the most part, do not live in California, but earn some income here that requires them to file a CA tax return.

During 2001-07, 27% of those making between $500,000 and $1 million were not full-year residents; 42% of those making $1 million or more were likewise not full-year residents. For the control group, the non-residents made 17% of their annual income in California. For the treatment group, it was only 6%. In short, these are individuals who make the great majority of their income in ventures that are not sourced in California.

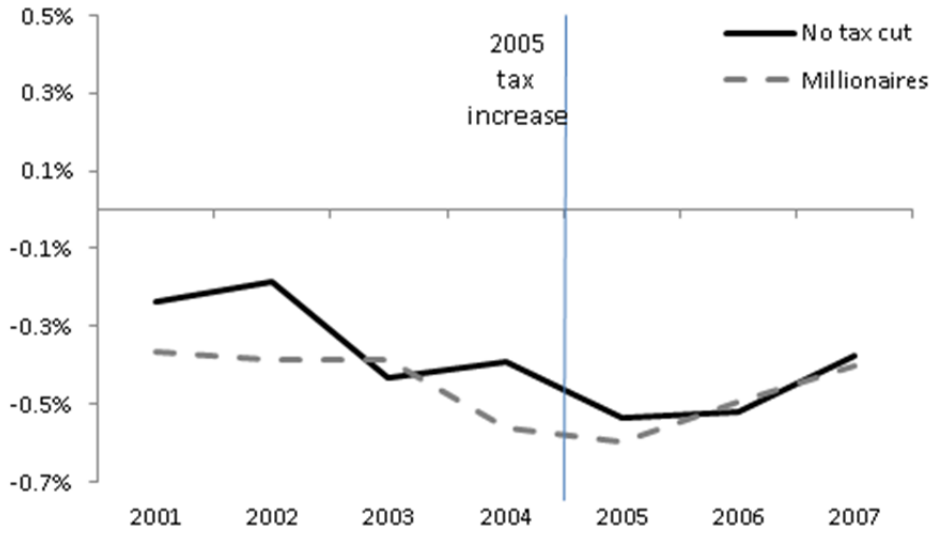
Table 4.1 looks at people making $500,000+ in focal year (-2), and then follows median income as they make the transition PPFF (in-migration) or FFPP (out-migration).

People who make the PPFF in-migration transition see a large jump in the share of their income that is CA-taxable, from 12%, to 32%, to 100% (this is partly because once a person is a full-year CA resident, all their income, regardless of source, is CA taxable). Likewise, people who out-migrate see a large drop in their income from 100% to 52% in the transition year, dropping to 17% the next year. These people are clearly reducing their economic attachment to California. For fiscal purposes, partial migrations are similar to full migrations.

Table 4.1 Income Trends of Partial Migrants

	Partial-to-Full In-Migration			Full-to-Partial Out-Migration		
	PPFF			FFPP		
Year	AGI		CA-Taxable Share	AGI		CA-Taxable Share
-2	$	878,849	12%	$	855,378	100%
-1	$	734,812	32%	$	741,661	100%
0	$	543,658	100%	$	699,356	52%
1	$	476,352	100%	$	590,196	17%

Figure 4.1 Net "Partial" Migration Rates



Source: FTB Microdata. N = 1,142,198

Figure 4.1 shows that California experienced a net loss in partial migrants in every year before and after the 2005 tax change. The net volume of partial migrations is actually greater than that of the core migration definition (compare with Figure 3.1). There is a net loss of roughly 0.4% of the population every year through partial migration. Nevertheless, the 2005 tax hike did not have an observable effect on partial

migrations. If anything, partial out-migration among the treatment group declined (shifted towards zero) after the tax was passed.

Table 4.2 shows the raw counts of base population, in-migrants, and out-migrants in each year, for both the treatment and control groups.

Table 4.2 Partial Migration Rates, 2001-07

Control Group ($500k-$1M)

	Pop	In-mig	Out-mig	Net	Net Rate
2001	75,168	296	473	-177	-0.24%
2002	68,110	241	368	-127	-0.19%
2003	76,936	209	541	-332	-0.43%
2004	95,310	294	666	-372	-0.39%
2005	112,861	324	929	-605	-0.54%
2006	124,076	376	1019	-643	-0.52%
2007	133,743	473	977	-504	-0.38%
Std Dev	24,036	81	244	186	
Min	68,110	209	368	-643	
Max	133,743	473	1,019	-127	

Treatment Group ($1M+)

	Pop	In-mig	Out-mig	Net	Net Rate
2001	47,648	193	367	-174	-0.37%
2002	40,171	162	317	-155	-0.39%
2003	46,613	201	381	-180	-0.39%
2004	61,500	222	568	-346	-0.56%
2005	74,385	287	731	-444	-0.60%
2006	82,769	290	697	-407	-0.49%
2007	90,252	346	708	-362	-0.40%
Std Dev	18,087	61	167	113	
Min	40,171	162	317	-444	
Max	90,252	346	731	-155	

The next table (4.3) shows the annual changes in the millionaire population, compared to changes in net partial migration of millionaires. Changes in partial migration account for less than one percent (0.7%) of the changes in the millionaire population.

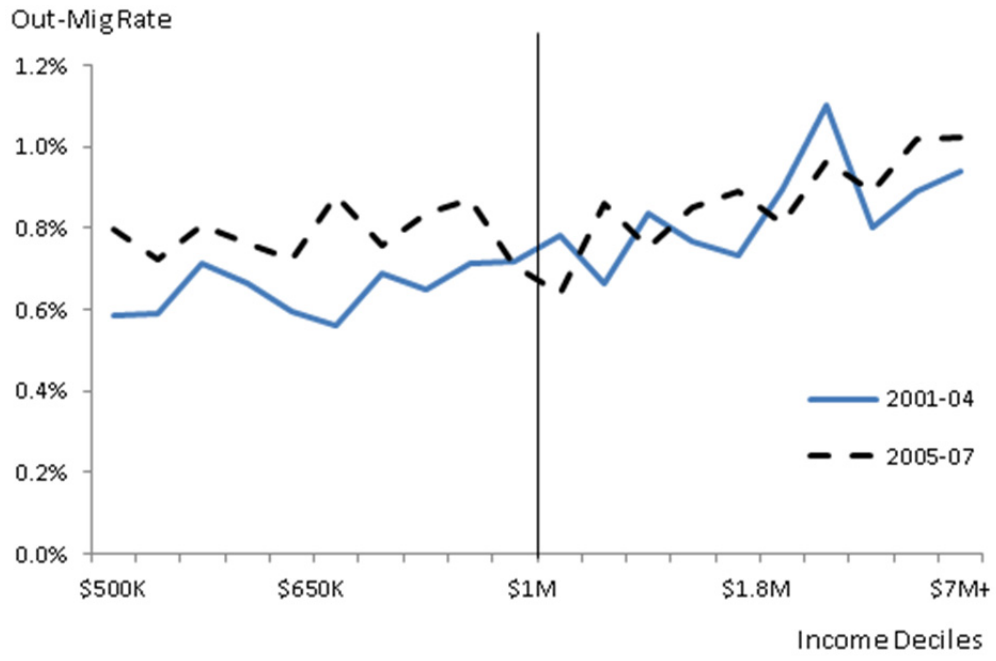
Table 4.3 Millionaire Population Changes and Partial Migration

	Change in Number of Millionaires	Change in Net (Partial) Migration of Millionaires
2002	-7,477	19
2003	6,442	-25
2004	14,887	-166
2005	12,885	-98
2006	8,384	37
2007	7,483	45
Average of Absolute Changes	9,593	65

Figure 4.2 shows the "partial" out-migration rates, by income decile, before and after the MHST. Here, we define out-migration by two years of full-year filings followed by two consecutive years of part-year/nonresident filings (FFPP). The data show that partial migration is indeed common among top-income earners. "Partial" and "complete" out-migrants appear in the data in roughly equal numbers. In contrast to the pattern for "complete" migration, partial migration increases with income. This may help explain some of the downward slope we saw in the main results. Top-income earners may be more likely to change residences without giving up their job (or other income opportunity) in their current state.

We would expect to observe a widening gap across the income distribution, since multi-millionaires experience larger tax increases than millionaires do. However, Figure 4.2 does not show the expected pattern. Instead, the gap narrows slightly with a DiD of -0.1 percent. Contrary to the tax flight argument, there is no tax effect on California top-income earners who "partially migrate."

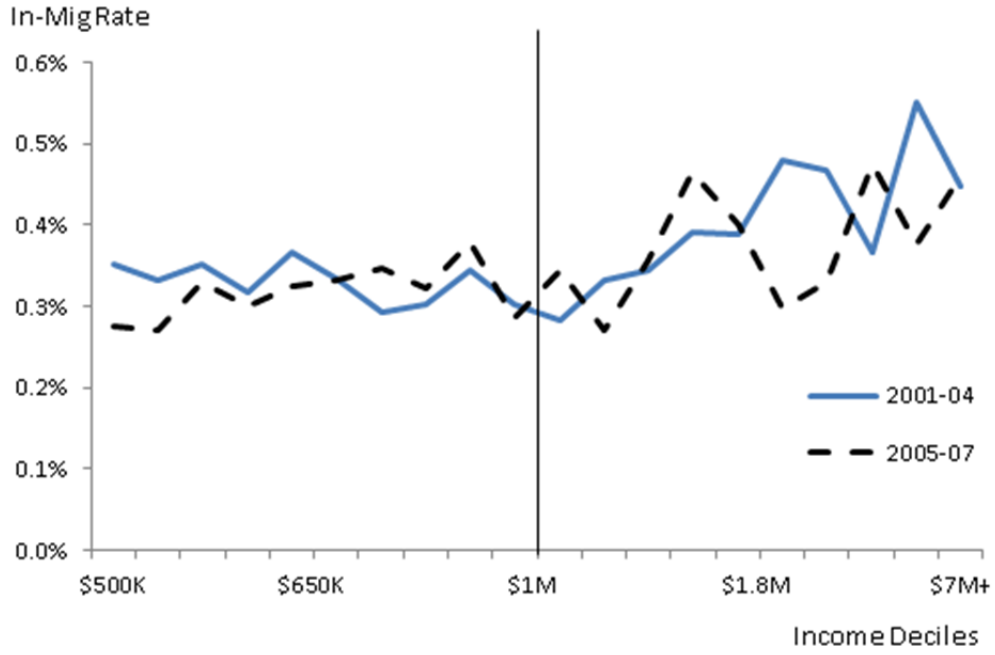
Figure 4.2 Partial out-migration (FFPP)



	Before	After	Diff
Control	0.6%	0.8%	0.1%
Treatment	0.8%	0.9%	0.0%
Diff	0.2%	0.1%	-0.1%

The story is similar for in-migration, shown in Figure 4.3 below. Again, "partial" in-migration is more common as a pattern among millionaires, and particularly, multi-millionaires. However, there is no difference in the rates before and after the MHST. For partial in-migration the DiD estimate is actually zero.

Figure 4.3 Partial in-migration (PPFF)



	Before	After	Diff
Control	0.3%	0.3%	0.0%
Treatment	0.4%	0.4%	0.0%
Diff	0.1%	0.1%	0.0%

4.2 Divorce Analysis

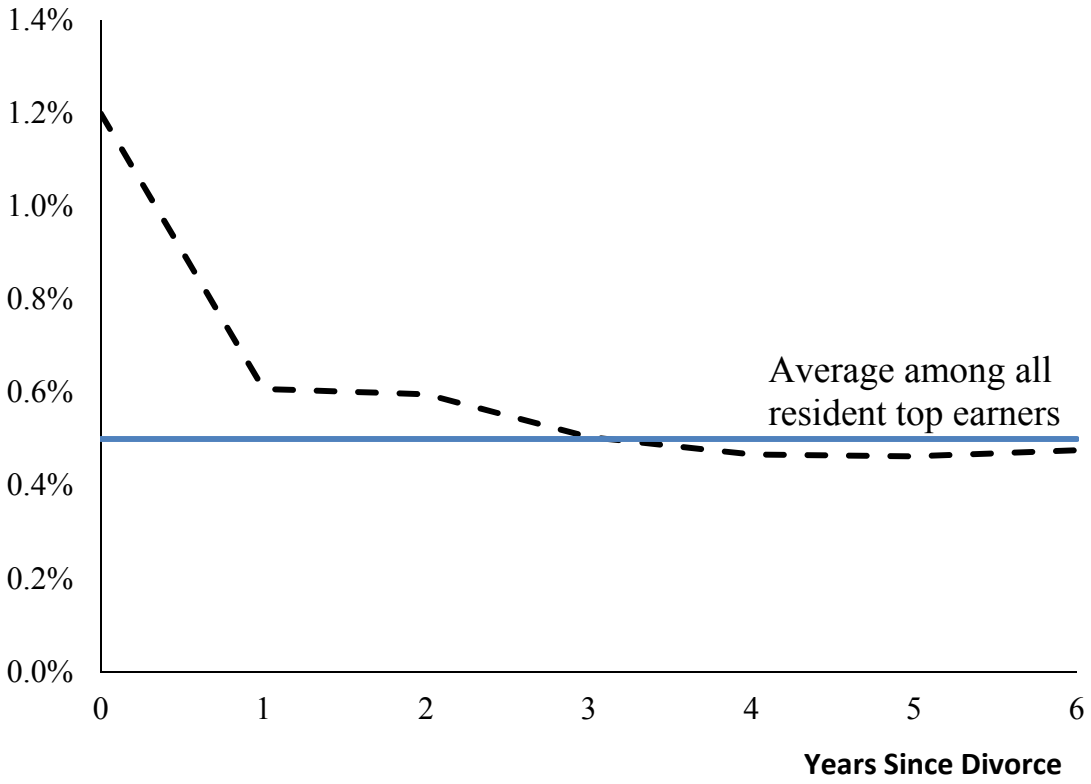
Both the main results and the sensitivity check on partial migration find no responsiveness to the tax changes. This could indicate that the migration measures in the data are just too noisy to detect a response. To check this possibility, we estimate responsiveness to a very probable migration cause—divorce. At least one member of the divorcing couple is changing residency, and is often seeking distance and a new start in life. We expect divorce to significantly increase the probability of migration.

We identify episodes of divorce when individuals changing their filing status from "married filing jointly" in year (-1) to "single" in year (0). In other words, these are individuals who filed as married in the previous year, and filed as single in the current (focal) year.

Figure 4.4 compares the out-migration rates among recent divorcees to the top-income earner population average out-migration rate. Divorced individuals are grouped by the number of years that have elapsed since divorce. Recent divorce has a clear effect on migration propensity. The more recent the divorce, the stronger is the migration response. Relative to the population average, divorces that occurred in the past year more than double the out-migration rate, from 0.5 to 1.2 percent. This "divorce effect" falls off as time passes and is fairly flat for divorces that happened more than three years ago. In short, divorce increases the likelihood of migration for the first three years – though much of this effect occurs in the first year. After three years, migration propensity returns to population-wide levels.

The basic conclusion from this analysis is that the FTB data can clearly detect factors that influence migration. Divorce is something that has a very clear effect on migration; modest changes in the tax rate for high-income earners do not.

Figure 4.4. Percent out-migrant, by years elapsed since a divorce.



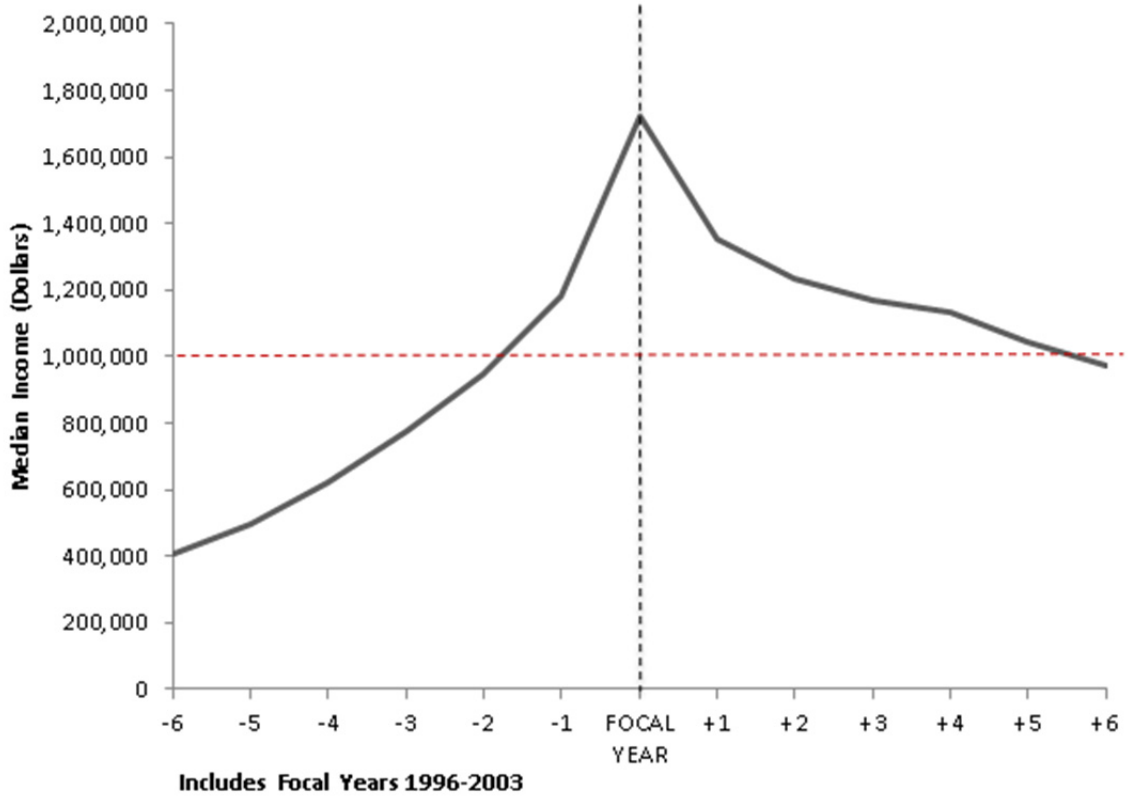
Note: Includes focal years 1999-2007. Includes individuals earning $500,000 + in focal year.

4.3 Income Profile Analysis

If a person is a "millionaire" in a given tax year, how many years should they expect to be in the bracket? This is a key question for someone considering whether to migrate for tax purposes.

We took people who were in the bracket in a given year, and looked at their income six years before and six years after. As shown in Figure 4.5, people are in the tax bracket for 7 out of 13 years, or 54 percent of the time.

Figure 4.5 Median Income Profile of People Making $1M+ in Focal Year



This varies based on the business cycle. But in general and for most people, earning a million dollars a year is a temporary situation. It is more of a spike in earnings than their usual, year-to-year income.

Also, what proportion of their long-term income is subject to the tax? This is important, since only the income above $1 million is subject to the tax.

In this analysis, annual median income aggregated over 13 years is roughly $13 million. Of that, only $1.8 million fell inside the millionaire tax bracket. This means that only 14% of their "lifetime" (13-year) income would be affected by the tax (if the tax had been in place all years). The total 13-year MHS tax bill for a representative millionaire would be about $18,000. As a share of lifetime income, this is an effective tax rate of roughly 0.1% (one-tenth of one percent).

In summary, the long-term view shows that a representative millionaire earns enough to hit the tax bracket in only half of their prime income-earning years, and over this period only 14% of their income is subject to the extra marginal tax rate. *For the representative millionaire, their effective tax increase is not 1 percent, but rather 0.1 percent.* For most people, the tax falls on a few unusually good years of earnings. This helps explain why we see so little responsiveness to the tax.

Conclusion

This study has used the California income tax data to evaluate how high-income tax-filers respond to the introduction of a millionaire's tax. Our central findings are as follows.

1. Migration is a very small component of changes in the number of millionaires in California. While the millionaire population sees a typical year-to-year fluctuation of more than 10,000 people, net migration sees a year-to-year fluctuation in a range of 50 to 120 people. At the most, migration accounts for 1.2 percent of the annual changes in the millionaire population. The remaining 98.8 percent of fluctuation in millionaire population is due to income dynamics at the top – California residents growing into the millionaire bracket, or falling out of it again.

2. Using difference-in-differences models, which compares migration trends of the group experiencing the tax increase to a group of high-income earners *not* facing a tax change, neither in-migration or out-migration show a tax flight effect from the introduction of the 2005 Mental Health Services Tax. In fact, out-migration has a "wrong-signed" estimate: out-migration declined among millionaires after the tax was passed (both in absolute terms and compared to the control group).

3. The 1996 tax cut for high-income earners likewise had no consistent effect on migration. There was a small effect for those experiencing the small (0.7%) tax cut, but no effect at all for those experiencing the large (1.7%) rate cut. While we are planning to analyze the 1996 tax cut in greater detail, the overall picture is one of no consistent effect.

4. Using an expanded definition of migration – the shift from resident to non-resident tax filer (i.e., not living in California but still earning some income in California), we continue to see no evidence of responsiveness to the MHS tax. This group is unexpectedly important: many high-income out-migrants do, in fact, continue to earn some income and pay some taxes in California. This group also shows the "wrong-signed" estimate for out-migration. This is similar to the wrong-signed estimate in our

core migration measure: “full” out-migration of millionaires also declined after the tax was passed (both in absolute and relative to the controls).

5. There is a strong out-migration effect for high-income earners who become divorced. In the year of divorce, the migration rate more than doubles, and remains slightly elevated for two years after the event. This shows that there are circumstances that do generate millionaire migration. The tax policy changes examined in this report are very modest compared to the life-impact of martial dissolution.

6. Most people who earn $1 million or more are having an unusually good year. Income for these individuals was notably lower in years past, and will decline in future years as well. A representative “millionaire” will only have a handful of years in the $1 million + tax bracket. The somewhat temporary nature of very-high earnings is one reason why the tax changes examined here generate no observable tax flight. It is difficult to migrate away from an unusually good year of income.

References

Baldwin, Richard E., and Paul Krugman, 2004. "Agglomeration, Integration, and Tax Harmonisation." *European Economic Review* 48, 1–23.

Castells, Manuel, 1989. *The Informational City: Information Technology, Economic Restructuring and the Urban-Regional Process*. Oxford: Basil Blackwell.

Charney, A.H., 1993. "Migration and the Public Sector: A Survey", *Regional Studies* 27, 313–326.

Coomes, Paul A., and William H. Hoyt, 2008. "Income Taxes and the Destination of Movers to Multistate MSAs." *Journal of Urban Economics* 63 (3), 920–937.

Day, Kathleen M., and Stanley L. Winer, 2006. "Policy-Induced Internal Migration: An Empirical Investigation of the Canadian Case." International Tax and Public Finance 13 (5), 535–564.

Feldstein, Martin, and Marian Wrobel, 1998. "Can State Taxes Redistribute Income?" *Journal of Public Economics* 68, 369–396.

Glaeser, Edward L. and Joshua D. Gottlieb, 2009. "The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States." *Journal of Economic Literature*. Vol. 47(4): 983-1028.

Graves, P.E., 1979. "A Life-Cycle Empirical Analysis of Migration and Climate, by Race," *Journal of Urban Economics* 6: 135–147.

Greenwood, Michael J., 1997. "Internal Migration in Developed Countries." In Rosenzweig, M.R. and O. Stark (eds.), *Handbook of Population and Family Economics*, 647–720: Elsevier Sciences B.V.

Gross, Emily, 2003. "U.S. Population Migration Data: Strengths and Limitations." Internal Revenue Service Statistics of Income Division, Washington, DC. http://www.irs.gov/pub/irs-soi/99gross_update.doc

Kleven, Henrik, Camille Landais, and Emmanuel Saez, 2010. "Taxation And International Migration Of Superstars: Evidence From The European Football Market." NBER Working Paper 16545. http://www.nber.org/papers/w16545.

Liebig, Thomas, Patrick Puhani, and Alfonso Sousa-Poza, 2007. "Taxation and Internal Migration—Evidence From the Swiss Census using Community-Level Variation in Income Tax Rates." *Journal of Regional Science* 47 (4), 807–836.

Massey, Douglas S., Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, and J. Edward Taylor, 1993. "Theories of International Migration: A Review and Appraisal." *Population and Development Review* 19 (3), 431–466.

Mirrlees, James A., 1982. “Migration and Optimal Income Taxes.” *Journal of Public Economics* 18 (3), 319–341.

Sassen, Saskia, 1988. *The Mobility of Labor and Capital: A Study in International Investment and Labor Flow*. Cambridge: Cambridge University Press.

Simula, Laurent, and Alain Trannoy, 2011. “Shall We Keep the Highly Skilled at Home? The Optimal Income Tax Perspective.” CESifo Working Paper No. 3326.

Sjaastad, Larry A., 1962. “The Costs and Returns of Human Migration.” *Journal of Political Economy* 70 (5, Part 2), 80–93.

Young, Cristobal, and Charles Varner, 2011. “Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment.” *National Tax Journal* 64 (2), 255–284.

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CHAPTER 3. MILLIONAIRE MIGRATION AND STATE TAXATION OF TOP INCOMES: EVIDENCE FROM A NATURAL EXPERIMENT

Cristobal Young and Charles Varner

Key words: state income tax, top earners, migration, tax competition, difference-in-differences estimator

JEL codes: J61, H73, R23

ABSTRACT

This chapter examines the migration response to a millionaire tax in New Jersey, which raised its income tax rate on top earners by 2.6 percentage points to 8.97 percent, one of the highest tax rates in the country. Drawing on unique state tax micro-data, we estimate the migration response of millionaires to the rate increase, using a difference-in-differences estimation strategy. The results indicate little responsiveness, with semi-elasticities generally below 0.1. Tax-induced migration is estimated to be higher among people of retirement age, people living on investment income rather than wages, and people who work (and pay tax) entirely in-state. The tax is estimated to raise $1 billion per year and modestly reduce income inequality.

I. INTRODUCTION

State governments in the United States have traditionally avoided policies that "tax the rich." While the federal government relies on a progressive income tax, states generally rely on more regressive sales and property taxes as well as relatively flat-rate income taxes (Piketty and Saez, 2007; Slemrod, 2000).[1] Over time, however, the progressivity of the federal income tax system has declined, while states are beginning to add high-income surtaxes. In the early 1960s, the top marginal income tax rate in the federal system was 91 percent. Successive reforms have brought this top rate down to 35 percent. In recent years, states have begun to compensate by raising the progressivity of their own income tax systems — a trend becoming known as the "millionaire tax" movement. This is a process of reclaiming progressivity by shifting it from the federal level to the state level.[2]

States have long been fearful of taxing people — particularly top income earners — to the point of migration. Indeed, state income taxes have traditionally been quite flat, with the highest marginal rates occurring at low thresholds. In 2007 the median state income tax system had a flat rate on income over $25,000. In contrast, the top federal tax rate occurs at about $370,000 — some 15 times higher. State income taxes are substantially less progressive than federal income taxes, but this is changing. What are the implications of the new state millionaire taxes? In the popular press, these taxes have

[1] The distributional incidence of sales and property taxes depends on the choice of annual versus lifetime measures of income and whether property taxes more heavily burden capital owners or labor (Caspersen and Metcalf, 1994; Fullerton and Metcalf, 2002; Zodrow, 2007).

[2] In New Jersey, Governor McGreevey specifically cited the Bush tax cuts when the millionaire tax was enacted (Office of the Governor, 2004). Seven other states have since enacted similar millionaire taxes: California (2005), Maryland (2008), Hawaii (2009), New York (2009), Wisconsin (2009), Connecticut (2010), and Oregon (2010).

been often criticized as expulsive agents, certain to provoke tax flight of the wealthy. In Maryland, for example, the tax was panned as the "get out of Maryland tax act" (Stanek, 2008). However, states may be able to tax high incomes without inducing migration because of location rents, high transaction costs of moving, and the family and social network ties that ground people in their communities. This study focuses on one of the first, and notably the largest, state millionaire taxes to be adopted in the United States — that of New Jersey. Drawing on administrative micro-data, we estimate the effect of the tax on migration, and further estimate revenues generated, the tax flight cost, and the overall impact on the distribution of income in the state.

Moving out of a state is much easier than moving out of the country. This fact suggests that states should avoid high-rate income taxes and rely on the federal government to impose progressive taxes. Feldstein and Wrobel (1998) argue further that state governments simply *cannot* redistribute income. By raising taxes on the wealthy and providing transfers to the poor, states will see an out-migration of the wealthy (fleeing taxes) and an in-migration of the poor (seeking transfers). This not only erodes the tax base, but also triggers a market wage adjustment by creating a shortage of high-skill workers and a surplus of low-skill workers. The market bids up wages for high-skill workers, and bids down wages for low-skill workers. The resulting increase in wage inequality counteracts the equalization due to progressive tax and transfer systems. The state is left with fewer rich people earning higher market incomes, and more poor people earning lower market incomes.

Empirically, Feldstein and Wrobel (1998) test the *wage element* of this hypothesis, calculating the elasticity of gross wages to the tax rate, and find that when an

individual's tax rate is high, their wages also tend to be higher. This, they argue, is evidence consistent with their thesis. However, this is also the definition of a progressive tax rate, and the causal direction remains unclear in our view.[3] Further studies have followed up Feldstein and Wrobel's (1998) analysis of wages, and find smaller effects, concluding that pre-tax wages do not fully adjust to changes in income taxation (Thompson, 2009; Leigh, 2008).

These empirical approaches tacitly assume — but do not demonstrate — the causal pathway of a migration response to taxes. Given the centrality of migration in the theory, much more compelling tests can be achieved by directly investigating tax-induced migration. As Day and Winer emphasize, migration "cannot be taken for granted" in economic theories (2006, p. 536). Likewise, Mirrlees argued that while "high tax rates encourage emigration," it is "the propensity to migrate" that determines how the incentive is transformed into actual behavior (Mirrlees, 1982, pp. 319, 323). Feldstein and Wrobel (1998), using instrumental variables, find that wages seem to adjust *as if* migration were occurring. But this does not demonstrate that people *do* actually migrate in response to taxes.

Thus, empirical evidence of migration is key — and conceptually foundational — to testing the constraints that state governments face in utilizing progressive income

[3] Feldstein and Wrobel control for state fixed effects, which eliminates cross-state variation in tax rates. They are aware of the reverse causation issue, and use an instrumental variables strategy in an attempt to eliminate the problem. Specifically, they instrument an individual's actual tax rate with an imputed tax rate calculated from their predicted gross wages (as determined by their demographic characteristics rather than their actual wage and hours of work). As has been widely noted, with instrumental variables, the "cure can be worse than the disease" (Bound, Jaeger, and Baker, 1993). In our view, this strategy does not offer a clear and vivid identification strategy and does not persuade us of strong exogenous variation (Young, 2009), as Feldstein and Wrobel seem to simply describe a progressive tax system — higher incomes mean higher tax rates.

taxes. Most importantly, there is virtually no research on the "propensity to migrate" among wealthy individuals. This study fills a salient gap by examining how an increase in state income tax progressivity produces changes in the migration patterns of very high-income earners (the top 1 percent and the top 0.1 percent).

II. EXISTING RESEARCH

The literature suggests that the general propensity to migrate in response to tax changes is low. Day and Winer (2006), using more than 20 years of Canadian income tax records, find that marginal changes in tax rates and social policies had no observable effect on inter-provincial migration. They did find, however, that large-scale calamitous events — such as the closing of the cod fishery in Eastern Canada — produce substantial out-migration. Coomes and Hoyt (2008) studied the locational choices of people moving into "multi-state" cities — metropolitan areas that encompass more than one state (and thus offer a choice of different tax regimes). They found very little response to tax differentials, noting that for "most high-tax states, the effect is likely to be only a few hundred potential taxpayers lost."[4] This finding is particularly noteworthy, since these multi-state cities offer the greatest opportunity to arbitrage tax systems. Bakija and Slemrod (2004) examine state inheritance taxes in the United States, testing whether older citizens avoid states that will more heavily tax their estates. They find "robust evidence of some sort of behavioral response to estate taxes by the rich" (Bakija and

[4] Coomes and Hoyt (2008) also produce a very counter-intuitive result. States can reduce locational tax competition by taxing based on the location of the employer, so that workers gain less advantage by working in a high-tax state but living in a low-tax state. Nevertheless, Coomes and Hoyt (2008) find the largest migration effects in places that have reduced the incentive for locational tax competition.

Slemrod, 2004, p. 32), but the size of the effect was clearly small in comparison to the revenues generated.

Finally, a series of studies has examined fiscally-induced migration in the highly decentralized income tax system of Switzerland. Liebig, Puhani, and Sousa-Poza (2006, p. 8) highlight the ideal conditions for tax competition:

> Even between communities less than 20 km apart, differences in average and marginal tax rates of more than 5 percentage points are quite common. These differences…may prompt people to change their residence solely for tax purposes while still commuting to the same job.

In short, like Coomes and Hoyt (2008), Liebig, Puhani, and Sousa-Poza (2006) offer a "most likely" research design that maximizes the chance of empirically detecting a migration response to taxation (and thus maximizing power to reject the main hypothesis).[5] Overall, they find little evidence of fiscally-induced migration. The strongest effects are found for young college graduates, and even for this group the effect is small relative to revenues generated.

The consensus emerging from the migration literature — and from a range of research designs — is that people do not generally migrate in response to tax increases (or to tax differentials that would be "easy" to arbitrage).[6] The reasons for this are no doubt plentiful: (1) people do not like commuting (Kahneman et al., 2004); (2) they do not want to give up their jobs (Winkelmann and Winkelmann, 1998); (3) they do not want to separate from their family, friends, and neighborhoods (Dahl and Sorenson, 2010); and thus they have a general aversion to migration. For homeowners, brokerage

[5] For a discussion of "most likely" cases and research designs, see King, Keohane, and Verba (1994).

[6] It is worth noting that poor people likewise do not generally migrate in response to greater welfare benefits (Gensler, 1996; Levine and Zimmerman, 1999; Kaestner, Kaushal, and Ryzin, 2003).

fees associated with selling their existing home and buying a new one consume a large portion of annual income (in the range of 25 percent) (Wildasin, 1993). Moreover, because taxes tend to finance public goods that people value, resistance to migration may allow people time to acclimatize to a higher-tax, higher-public services environment (i.e., give people time to observe the impact of their tax dollars).

But perhaps, as Alm and Wallace (2000, p. 165) argue, "the rich are different." The taxable income elasticity literature does suggest that the affluent may be more sensitive to marginal changes in the tax rate than middle- or low-income taxpayers. Feldstein (1995) found that reported taxable income notably dropped in response to tax increases, suggesting tax evasion or a reduction of labor supply or other behavioral adjustments (see also Feenberg and Poterba, 1993). A large empirical literature has since tempered this result, but still shows a strong response from wealthy taxpayers (Saez, Slemrod, and Giertz, 2009). Goolsbee (2000), using a panel of top corporate executives, found a large spike in exercised stock options immediately prior to the 1993 federal tax increase, but no long-term change in earnings. Thus, the greater tax responsiveness of the wealthy may be largely facilitated through their greater control over the timing of their compensation and their greater ability to preempt a tax increase. Nonetheless, there is sufficient evidence to suggest that the wealthy are more responsive to changes in the tax structure than is the general populace, and thus are also more inclined towards a tax flight response. We test this expectation empirically.

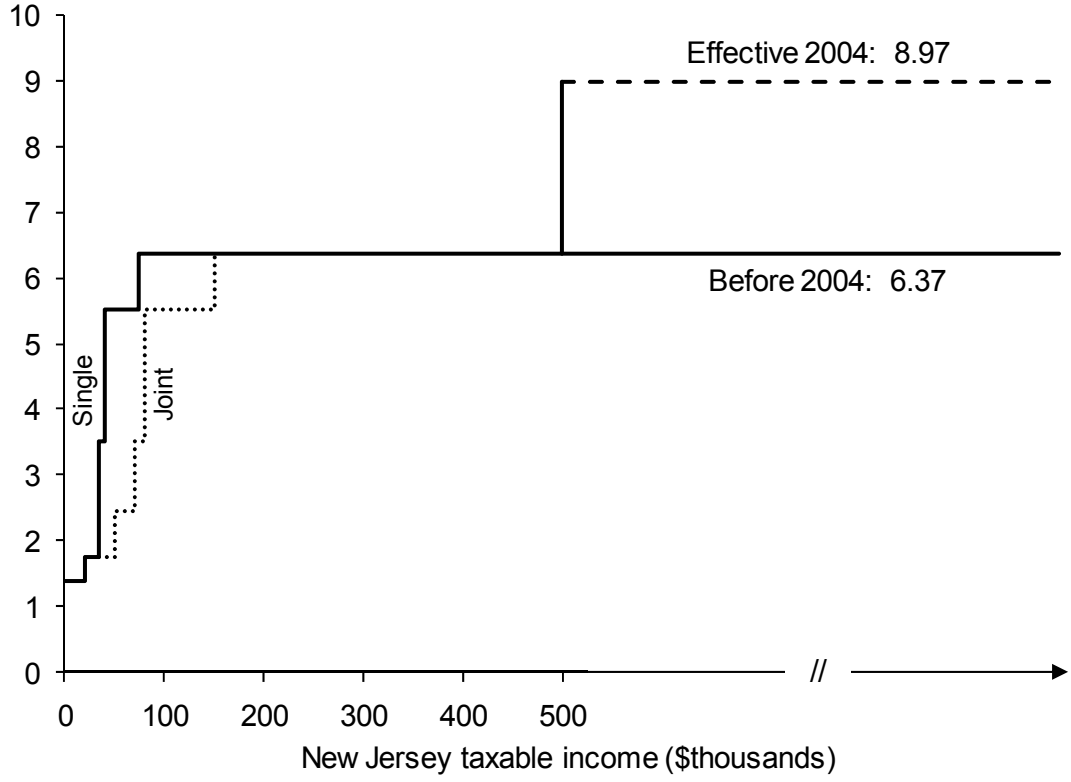
III. THE MILLIONAIRE TAX POLICY EXPERIMENT

Our empirical strategy is based on identifying the migration patterns of high-income earners, and then observing how these patterns change in response to a new millionaire tax. The new bracket was introduced in 2004, and raised the marginal rate by 2.6 percentage points on income above $500,000.[7] The legislation was passed mid-year and applied retroactively, so taxpayers had little ability to migrate in advance of the tax increase (Office of the Governor, 2004). We treat the 2004 policy change as a natural experiment, and test whether it caused an observable shift in migration patterns. We demonstrate that this policy change was large in two ways. First, Figure 1 shows the change to the New Jersey tax schedule. The step up in the marginal rate at $500,000 is clearly substantial, and a salient shift given the flat marginal rate over $150,000. It is doubtful that the new tax went unnoticed by many millionaire tax filers.

[7] We will use the term "millionaire" for all tax filers whose annual income exceeded $500,000, consistent with the term commonly used for the new bracket ("the millionaire's tax").

Figure 1

Schedule of New Jersey Marginal Income Tax Rates (%)



Second, the millionaire tax was a major policy change compared to other state tax regimes. New Jersey does not have the highest marginal income tax rate in the United States, but it introduced, by a wide margin, the largest increase in top marginal rates among any state during the period of study. Figure 2 shows the changes in the top marginal rates from 2000–2007. New Jersey's rate increase of 2.6 percentage points vastly exceeds that of its neighbor, Connecticut, which had the second highest increase of 0.5 points. Most states showed very small changes (either increases or decreases) in their top marginal rates — and Figure 2 excludes the 18 states that had no change at all. One fact that does not come through in this figure is that New York had a temporary

millionaire surtax of 0.85 percent from 2003–2005. However, even this surtax was only one-third of the rate increase in New Jersey.

The millionaire tax is a major policy experiment both in the context of the New Jersey tax system, and in the context of what other states were doing during this time (which, for the most part, were cutting rather than raising top income taxes). Another factor that makes New Jersey an ideal case study is its unique location as a core part of the New York metropolitan area, which includes 21 million residents across four states: New York, New Jersey, Connecticut, and Pennsylvania. Figure 3 shows the geography of the tax systems in this area. On one hand, being situated across the river from Manhattan — with its cultural draws and high-paying employers — might seem to support New Jersey's ability to tax the rich. Yet, the wealthy from New Jersey have three other state tax systems they can arbitrage without leaving the New York metropolitan area. For example, high earners living in Bergen County, New Jersey, can move about 30 miles to Fairfield County, Connecticut, and watch their marginal tax rate fall from 8.97 percent to 5 percent. Few other places in the country make it easier to move to a different state without leaving one's city or completely separating from the social ties of friends and family. This jurisdictional proximity would suggest unusually intense regional tax competition. Nevertheless, large differences remain in top marginal tax rates.

Figure 2

State Changes in Top Marginal Tax Rates, 2000–2007



Notes: 18 states (not shown) had no changes for couples in the top bracket. Rates were computed using the NBER's TAXSIM program (Feenberg, 2010; Feenberg and Coutts, 1993). (1) Arkansas had a temporary increase of 0.21 percentage points that expired. (2) New York had a temporary increase of 0.85 percentage points that expired.

Regional competition for tax filers is partially reduced when states tax employment earnings where people work. Most people in the New York metropolitan area (as in most places) fall under this law. New Jersey employees cannot avoid New Jersey taxes on employment earnings by moving to Connecticut or New York. However, New Jersey and Pennsylvania have a reciprocal tax treaty under which employment income is taxed where people live, not where they earn it. Though many of New Jersey's richest residents live in the northern part of the state and have ties to New York City, the potential for regional tax competition around the Philadelphia metropolitan area is very strong. Without changing jobs, top earners in central and southern New Jersey *can* avoid the millionaire tax by moving across the state line to Pennsylvania; New Jersey and Pennsylvania maintain a 5.9 percentage point gap in their top marginal income tax rates.

For New Jersey residents who work in New York, the new millionaire tax would in many cases have little effect on their income tax bill. Although New Jersey added a higher top rate (8.97%), effective rates remained lower than New York State effective rates for many top earners. This is because New York rates are higher than New Jersey rates in the lower income brackets and because the New York "claw back" feature applies the top rate (which ranged from 7.7 to 6.85 percent during the 2004–2007 period) to all income for sufficiently high earners, as the benefits of lower bracket rates are phased out. Thus, New York State's effective tax rate was higher than New Jersey's on joint filers' taxable income between $0 and $1.34 million (2004–2005) and between $0 and $804,000 (2006–2007).[8] We cannot observe in our data who works in New York specifically, but we can identify people who have employment earnings from outside New Jersey. This

[8] This provides an additional reason why the top 0.1 percent (who earn more than $3 million) might be more sensitive to the new tax.

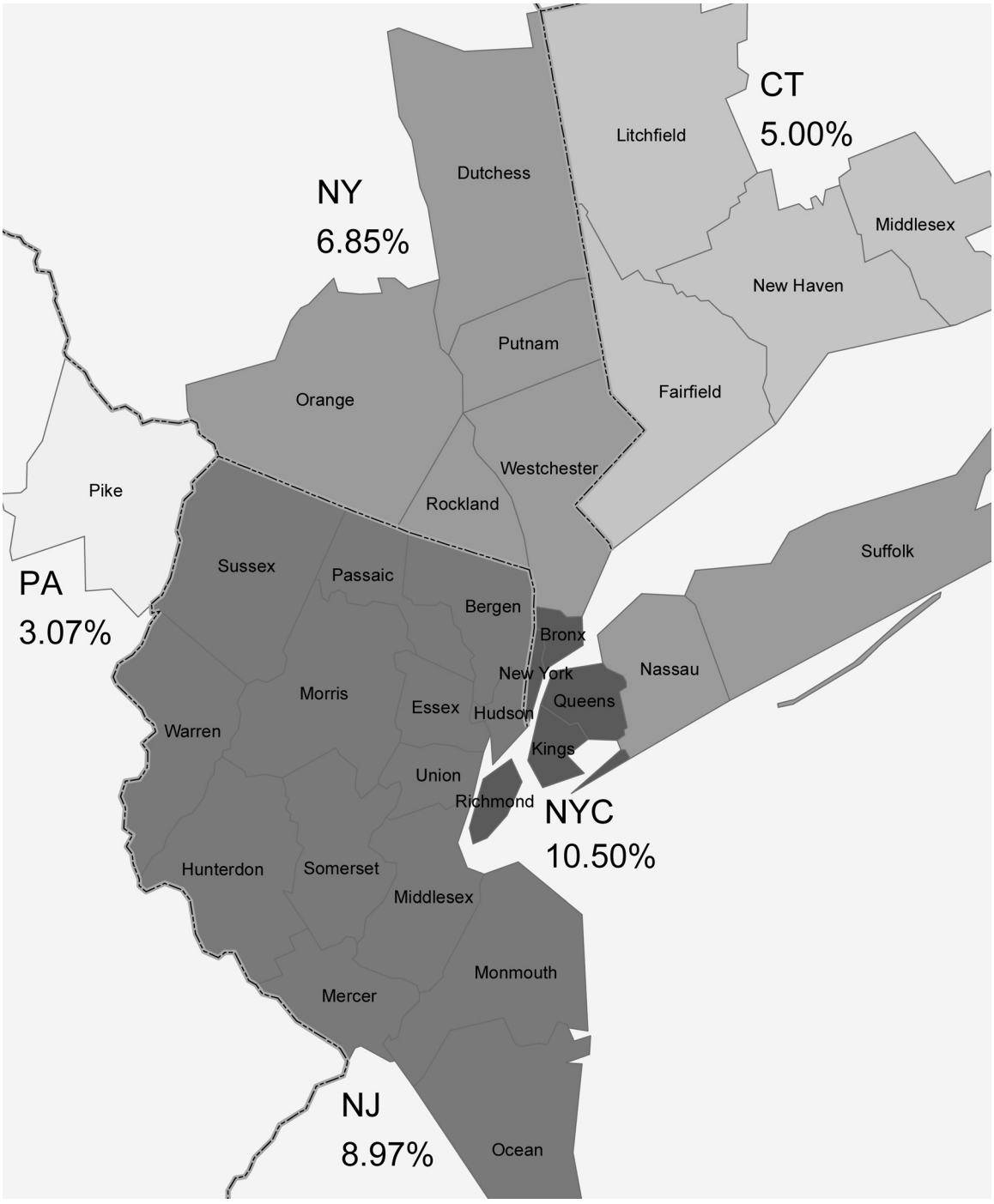
allows us to estimate the behavioral response among people who definitively pay all their tax in New Jersey.

Finally, it is important to note that earnings from investments (which make up about 30 percent of income in our data set) are taxed only where people live. For a substantial portion of the income of wealthy taxpayers, location of employment is *not* a constraint on tax competition.

The regional story is notably different for states like California, where the major urban areas are far from state boundaries that might invite regional tax competition. Arbitraging state tax systems when alternative states are far away means uprooting one's life and one's family, leaving behind social and business networks, and making a new life and a new career in a new part of the country. The intangible costs of migration are far higher in a state like California than they are in a state like New Jersey. Thus, both because of the magnitude of the policy experiment, and because of the potential for intense regional tax competition, New Jersey's millionaire tax is an excellent testing ground for the effects of taxation on millionaire migration.

Figure 3

Top Marginal State and Local Income Tax Rates in the
NY-NJ-CT-PA Consolidated Metropolitan Statistical Area, 2007



For this study, the New Jersey Division of Taxation (NJDT) granted us unique access to the complete NJ-1040 tax records for the years 2000–2007. This provides a virtual census of high-income earners, with information on income, taxes paid, and some limited demographic data retrievable from a standard tax form (such as marital status and number of dependents).[9] To identify an episode of migration, we use the reported dates of New Jersey residency on each NJ-1040 filed. Households that move into or out of New Jersey between January 2 and December 30 must file a part-year resident return for the tax year in which they moved. Non-migrant households, on the other hand, file full-year resident returns. This distinction in the filing process allows us to distinguish in- and out-migrant from non-migrant households.[10] The data set has an average of almost 40,000 households earning $500,000 per year, giving roughly 300,000 observations in total.

NJDT did not provide us with individual identifiers, meaning we cannot track individual returns over time. If we had these data, we could estimate not only the migration response to the tax increase, but also the elasticity of adjusted gross income (AGI) for those who do not migrate (Feldstein, 1995; Gruber and Saez, 2002).

[9] While many low-income earners do not file tax forms, higher-income earners have a strong incentive to file a tax return. Our discussions with NJ tax officials support this view. Virtually all high-income part-year residents have withheld taxes that entitle them to positive refunds. High-income migrants who fail to file their part-year tax records would thus forfeit non-trivial sums of income.

[10] The one exception is that we are not able to identify households who changed their legal residency status at the turn of the year. These January 1 in-migrants and December 31 out-migrants cannot be distinguished from non-migrants in the NJ-1040 data, and we must treat them as non-migrants in our analysis. This treatment will generate small underestimates of both out-migration and in-migration. Our estimates of net out-migration are accurate to the extent that January 1 in-migrants and December 31 out-migrants make up roughly equal proportions of total annual in-migrants and out-migrants, respectively.

The empirical problem with using part-year tax filers is that the full-year incomes of migrants are unknown. Consider an individual who lived in New Jersey for six months. From their tax record, we know their half-year income. Is this representative of their full year income? One strategy is to annualize part-year earnings. This strategy leads to some questionable imputations, particularly for people who earned high average daily incomes over a short period of residency. In some cases, tax filers reported more than $100,000 of income for a one-day period of residency. Annualizing this average daily income is clearly doubtful. We set a one-month (28-day) screen, and annualized the incomes of all migrants with a period of residency longer than that. Those with residencies of more than 28 days have their incomes annualized; those with shorter residencies are dropped. Obviously, there are many alternative annualization strategies. We find, in practice, that different strategies affect the volume of migration counts, but have little impact on estimates of the tax policy effect. Two alternate strategies — no annualization, and annualization using no residency period screen — do not substantially change our conclusions and make the estimates of the tax policy effect *smaller* than the results we report in the baseline model below.[11]

The data set was generated in May 2008, roughly three weeks after the deadline for 2007 tax returns. Late tax-filers are mostly missing for tax year 2007. We doubt that this affects our analytical results, but it does lead us to report fewer millionaires (and fewer millionaire migrants) for 2007.

[11] The results using these alternate strategies are available from the authors upon request.

IV. DESCRIPTIVE RESULTS: TRENDS IN MILLIONAIRE MIGRATION

New Jersey experienced net out-migration of millionaires in every year from 2000–2007, averaging a net outflow of 459 per year, or 1.2 percent of the state's millionaires. Nevertheless, the *stock* of millionaires increased substantially over this period, rising 43 percent (from about 33,000 in 2002 to about 47,000 in 2006). New Jersey is a *producer* of millionaires, not an importer. At current trends, migration is not an important determinant of the stock of millionaires in the state. Changes in net migration represent only 3.3 percent of the typical year-to-year fluctuation (standard deviation) in the number of millionaires in New Jersey. Income dynamics, rather than migration trends, are the central force that determines the tax base for the millionaire bracket. Migration, nonetheless, has certainly increased since the new tax was introduced in 2004. In the pre-tax period (2000–2003), net out-migration averaged 9.3 per thousand millionaires. Since the new tax was imposed, net out-migration rate has risen to 14.5 per thousand, an increase of 56 percent. Yet, as the baseline migration rates are so low, the impact on the stock of millionaires is very small. The increase represents a total loss of 5.2 households per thousand.

Table 1

Number of Millionaires and Net Out-Migration, New Jersey, 2000–2007

Tax year	Millionaire Tax Filers	Net Out-Migration Households	Net Out-Migration Per 1,000 Stock	Top Marginal Tax Rate
2000	41,358	239	5.8	6.37
2001	35,621	372	10.4	6.37
2002	32,726	342	10.5	6.37
2003	33,696	383	11.4	6.37
2004	39,235	577	14.7	8.97
2005	42,504	614	14.4	8.97
2006	46,651	686	14.7	8.97
2007	27,867	390	14.0	8.97
2000–2006 avg.	38,827	459	11.7	
Standard deviation	5,085	166		

Notes: Income is in constant 2007 dollars. Tax filers are included as of the beginning of the tax year, excluding part-year returns with residency periods less than 28 days and any tax returns filed after May 6, 2008; this cutoff implies a substantial shortfall for TY2007 relative to the total tax return count for the year. NJDT waits 10.5 months after the original filing deadline (April 15, 2008 for TY2007) to summarize data for its Statistics of Income report. However, TY2007 net out-migration per 1,000 stock is accurate to the extent that the filing date is not correlated with migration propensity. Source: NJDT micro-data.

This initial analysis offers two basic conclusions: (1) migration has a small impact on the millionaire tax base, accounting for only 3 percent of the variation in the number of millionaires each year; and (2) there *is* an observable increase in migration associated with the introduction of the new millionaire tax bracket.

V. DIFFERENCE-IN-DIFFERENCES MODEL

To further probe the impact of the new tax bracket, we develop a difference-in-differences estimator. For this, we exploit the fact that there is a plausible control group of high-income earners *not* subject to the new tax — those earning $200,000 to $500,000

per year (Saez, Slemrod and Giertz, 2009). For this group, the new millionaire tax has no effect, and thus should have no impact on their migration patterns. In short, we use households in the 95th–99th percentiles of the income distribution as a control group for households above the 99th percentile.

Formally, our model begins with two similar high-income groups: the treatment group whose income falls within the new tax bracket (taxable income > $500,000), and a control group of very high earners that fall below the new bracket (those earning $200,000–$500,000 per year). Both groups experience two time periods: pre-millionaire tax ($P = 0$) and post-millionaire tax (P=1). Migration status is coded as 1 = out-migrant, –1 = in-migrant, and 0 = non-migrant. This variable is then scaled by 1,000 to report migration flows per thousand population (the stock of millionaires). We model out-migration as

$$M_{it} = \alpha + \beta G_i + \lambda P_{it} + \delta(G_i * P_{it}) + \varepsilon_{it}, \qquad (1)$$

where βG_i is a fixed effect for each group, λP_{it} is a common period effect, and ε_{it} is a random error with mean zero ($E[\varepsilon_{it}] = 0$). The interaction term ($G_i * P_{it}$) equals one if G_i = 1 (treatment group) and $P_{it} = 1$ (post-millionaire tax period). The coefficient δ captures how much migration among the treatment group changed relative to the control group (whose migration change is captured by λP_{it}). In other words, δ is the difference-in-differences parameter, which measures the effect on migration of establishing the new tax bracket.

The key identifying assumption for the difference-in-differences (DiD) estimator is that the group of high earners *just below* the new tax bracket is a strong control group for those above the new bracket (subject to the tax). Other readily available DiD

estimates could use households with a small increase in effective tax rates (e.g., those earning $600,000) as a control for those with a larger tax effective increase (those earning $1 million). Our model allows the groups to have *different* baseline migration propensities, but assumes that their trends over time would be the same without policy changes.

As Donald and Lang (2007) argue, DiD designs that measure the effect of a group-level policy change on an individual-level outcome may underestimate the standard error of the policy effect. This downward bias may occur when the error structure (ε_{it}) is common within groups. In our study, a common error structure can occur because people in similar income ranges might migrate at similar rates for reasons we cannot observe. To account for this structure, we follow Bertrand, Duflo, and Mullainathan (2004) and use robust clustered standard errors, allowing for an unrestricted covariance structure within income groups.[12] Thus, the standard errors we report below are robust to error correlation across people and time within a given income group and to arbitrary forms of heteroskedasticity across income groups.

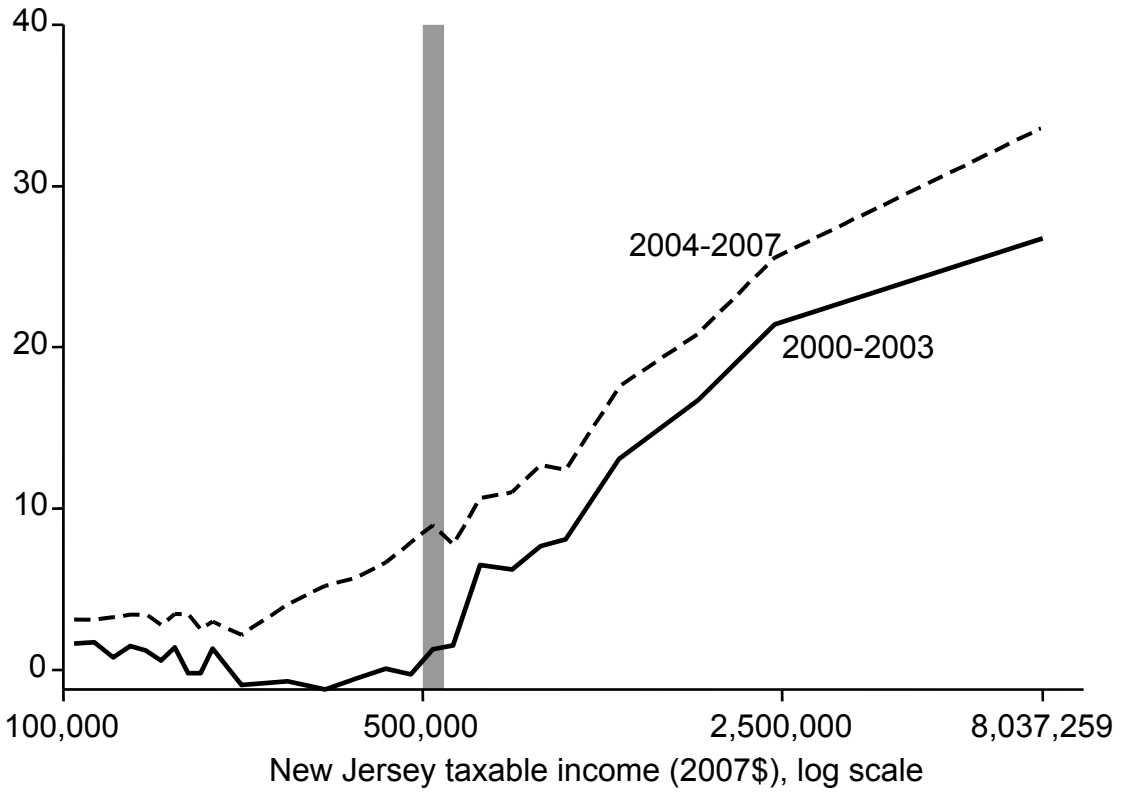
Before proceeding to the regression results, we provide a graphical look at the DiD model, plotting migration rates before and after the tax for detailed income (both control and treatment) groups. Specifically, Figure 4 plots the relationship between migration and income for the two main time periods (pre-tax and post-tax). The cut-point for the new tax bracket is shown by the bar at $500,000. In visual terms, the DiD estimator looks for *divergence* between the two slopes. The vertical distance between the

[12] For the clustering, we defined 20 income groups, in increments of $100,000 up to $1,000,000 and then widening. As a variant, we also clustered with 50 income groups, which yielded substantively equivalent results.

slopes gives the before-after (or difference) estimate at each income level. The DiD estimator uses *changes* in the vertical distance between the slopes ("the difference in differences"). If migration is responding to the new tax rate, there should be a growing gap between the two slopes as income increases above the $500,000 bracket. In contrast, Figure 4 shows a fairly constant difference. Most notably, migration rates increased for those below the tax bracket by approximately the same amount as for those *above* the tax bracket. This suggests that the policy effect is close to zero.

Figure 4

Net Out-migration per 1,000 Population, by Income Level



Note: 26 income groups are plotted at each group mean. The vertical bar is actually a cut-interval, due to bracket-creep caused by our adjustment for inflation. Adjusting incomes up to constant 2007 dollars causes some people who were below the bracket in 2004–2006 to appear as if they fell inside the new bracket. In practical terms, this creates a very small degree of noise, especially given that this is a marginal, rather than a "claw-back" tax. The width of the band in Figure 4 shows the extent of bracket-creep.

VI. REGRESSION RESULTS

The main regression results are reported in Table 2. First, we reproduce the simple before-after estimate (Model 1). This model estimates the change in migration over time for the millionaire group alone (no control group). Net out-migration among millionaires increased by 5.1 per thousand in the post-millionaire tax period, and the coefficient is much larger than its standard error. Model 2 gives the DiD results — similar to the graphical analysis from Figure 4 presented above. This shows that the Period 2 effect (introducing the tax) is nearly the same for those earning $200,000–$500,000 (4.6 per thousand), while the difference-in-differences estimate is only 0.5 and smaller than its standard error. In other words, the estimated policy effect has the expected sign but is small and statistically insignificant. Model 3 adds in a battery of controls for individual characteristics, all of which are significant but do not have a substantive effect on the DiD estimate. Baseline migration rates are higher for retirement-age people, and lower for wage-earners, married people, those with dependent children, and business-owners. These findings are suggestive of the socio-economic factors that facilitate or constrain wealthy people's ability or willingness to migrate in response to changing circumstances. Finally, Model 4 examines the top 0.1 percent of income earners. The DiD estimate for this group is 1.8 per thousand — larger than for less affluent millionaires (0.3 per thousand) — but still not statistically significant (and also much smaller than the simple before-after estimate).

Table 2

Regressions for Millionaire Migration

	Model 1 Before-After	Model 2 DiD	Model 3 DiD with Controls	Model 4 DiD with Controls and Top 0.1%
Period 2 (2004–2007)	5.123***	4.644***	4.358***	4.362***
	(0.541)	(0.828)	(0.813)	(0.815)
Millionaire		9.896***	8.255**	
		(2.266)	(2.187)	
* Period 2 (DiD)		0.479	0.413	
		(0.987)	(0.927)	
Share of income from wages			–10.35***	–9.998***
			(2.179)	(2.332)
Aged 65+			6.815***	6.870***
			(0.437)	(0.443)
Married			–4.879*	–4.906*
			(2.225)	(2.235)
Number of children			–1.593*	–1.608*
			(0.760)	(0.768)
Business owner			–2.038***	–1.905***
			(0.225)	(0.209)
Millionaires excluding top 0.1%				7.187**
				(2.079)
* Period 2 (DiD)				0.345
				(0.919)
Top 0.1%				24.19***
				(3.392)
* Period 2 (DiD)				1.776
				(3.830)
Intercept	9.125***	–0.771**	13.06***	12.81***
	(2.274)	(0.109)	(1.517)	(1.445)
N	305,404	1,420,652	1,420,652	1,420,652
Adjusted R-squared	0.0001	0.0005	0.0012	0.0013

Notes: Asterisks denote significance at the 5% (*), 1% (**), and 0.1% (***) levels (using two-tailed tests). The outcome variable is migration status, coded as 1 (out-migrant), –1 (in-migrant), 0 (non-migrant). All models use Ordinary Least Squares regression with robust clustered standard errors. Model 1 looks only at those earning more than $500,000 per year (defined as "millionaires"). Models 2–4 use those earning $200,000–$500,000 as a control group for the difference-in-differences estimates. Source: NJDT micro-data, 2000–2007.

In Table 3, we apply the Model 4 specification to particular groups in the millionaire population we expected to be more sensitive to the tax increase. To demonstrate the economic significance of the estimates, we also show the increase in effective tax rates for the treatment group in each case, and use this to compute the semi-elasticity of the population with respect to the tax rate (the percentage drop in the population due to a one percentage-point increase in the effective tax rate — a metric comparable to that used by Bakija and Slemrod, 2004). Table 3 first reproduces Model 4 from above, showing that the estimated semi-elasticities are very low: a one percentage-point increase in effective tax rate leads to a 0.04 percent decrease in the number of millionaires, and a 0.08 percent decrease in population among the top 0.1 percent of earners. Model 5 focuses on people who earn all of their wages in New Jersey, and thus paid all of their state income tax in-state. This group represents 62 percent of the overall sample (those earning more than $200,000), meaning that 38 percent earned some of their wages out of state.[13] Model 5 shows that the DiD estimate for millionaires is 2.5 (semi-elasticity of 0.28) but does not achieve statistical significance. For the top 0.1 percent, the estimate is (a non-significant) 9.8 with an implied semi-elasticity of 0.42. While not statistically significant, the findings have economic significance (McClosky and Ziliak, 1996) and are clearly suggestive: in states where fewer people work (and pay income tax) out of state, other things being equal, the effects of a millionaire tax may be larger than in New Jersey.

[13] We assume that the "different state" is typically New York, but our data set does not indicate the state to which income tax was paid.

Table 3

Additional Regressions for Millionaire Migration

	Model 4	Model 5	Model 6	Model 7	Model 8
	Baseline	Earned all income in New Jersey	Earned all income from investments	Aged 65+	Business owner
Millionaires (up to top 0.1%)					
DiD estimate (per 1000 population)	0.35	2.47	6.41	7.06*	–0.58
Standard error	0.92	1.29	4.15	3.18	1.35
Δ Effective tax rate (% points)	0.93	0.88	1.00	0.96	0.89
Semi-Elasticity	0.04	0.28	0.64	0.73	–0.07
Top 0.1%					
DiD estimate (per 1000 population)	1.78	9.84	27.44***	17.70**	11.11
Standard error	3.83	5.93	4.74	4.71	6.73
Δ Effective tax rate (% points)	2.34	2.32	2.34	2.34	2.34
Semi-elasticity	0.08	0.42	1.17	0.76	0.47
N	1,420,652	885,071	121,262	128,080	263,688
Portion of sample (%)	100	62	9	9	19
Adjusted R-squared	0.0013	0.0019	0.0035	0.0017	0.0007

Notes: Asterisks denote significance at the 5% (*), 1% (**), and 0.1% (***) levels (using two-tailed tests). The outcome variable is migration status, coded as 1 (out-migrant), –1 (in-migrant), 0 (non-migrant). All models use Ordinary Least Squares regression with robust clustered standard errors, and generally include the same controls as model 4 above (period 2, share of income from wages, aged 65+, marital status, number of children, and business ownership). Model 6 drops the share of income from wages; model 7 drops aged 65+; and model 8 drops business ownership. Semi-elasticities are computed as the DiD estimates divided by 10 (giving the percentage change in population), over the percentage point change in the effective tax rate. Source: NJDT micro-data, 2000–2007.

Model 6, in contrast, focuses on people who earn all their income from investments. This group should be particularly sensitive to the tax rate for two reasons: (1) they are not tied to the state by an employer; and (2) like the previous group, all of their income is taxed in New Jersey. The estimates indicate the new tax raised migration

by 6.4 per thousand among millionaires and by 27.4 among the top 0.1 percent of earners. The semi-elasticities are 0.64 and 1.17 respectively, although only the effects for the top 0.1 percent are statistically significant. While these individuals represent a small portion of the overall sample (9 percent), they seem more sensitive to the tax rate, particularly when their incomes are extremely high.

Model 7 focuses on persons of retirement age (over 65). The estimates are similar to those of Model 6, and indeed, there is much overlap between the two groups. Millionaires aged over 65 are substantially more sensitive to the tax rate than are younger millionaires. The results (semi-elasticities) here are closely comparable to the lower-bound estimates in Bakija and Slemrod's (2004) study of wealthy seniors.

Finally, Model 8 focuses on business owners. Our expectation is that business ownership reduces sensitivity to the tax rate, due to the extra costs associated with moving or closing a business operation. Nevertheless, the migration of business owners is a salient issue because their moves directly imply the migration of employment opportunities (a particular concern for state governments). Model 8 shows that for most millionaire business owners, the new tax had no significant effect, and the estimate has the "wrong sign." However, among the top 0.1 percent, business ownership could make people more sensitive to the tax, with a migration estimate of 11.7 per thousand (though not statistically significant) and a semi-elasticity of 0.47.

In summary, the difference-in-differences estimates indicate that the effect of the new tax bracket is negligible overall. Even among the top 0.1 percent of income earners, the new tax did not appreciably increase out-migration. For both groups, the semi-elasticity of migration with respect to a percentage-point increase in the tax rate is less

than 0.1 (i.e., a drop in population of less than 0.1 percent). However, there are subgroups of the millionaire population that seem more sensitive to the tax. People who work entirely in-state (and thus pay all their taxes in-state) may be more sensitive. This is relevant to a state like California, which likely has fewer residents who work out of state. Persons of retirement age are substantially more sensitive to the tax. This is relevant to a state like Florida, which has a very large population of retired people. Business ownership is a mixed case, which for the most part has no effect on tax sensitivity; however, the very richest business owners seem more sensitive — although their semi-elasticity is still less than 0.5.

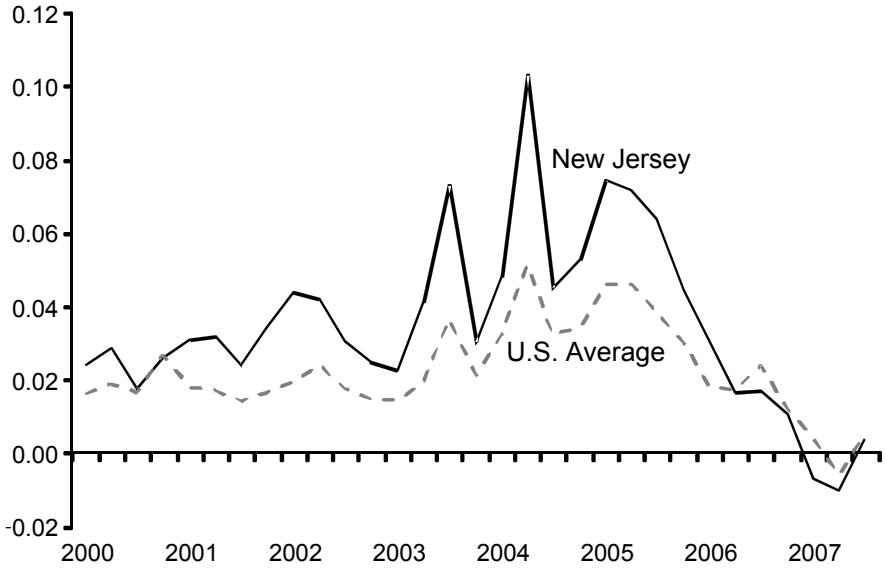
VII. DISCUSSION

This analysis has shown that while millionaire migration increased after the new millionaire tax in New Jersey came into effect, so did the migration of very high-income people *not exposed* to the new tax. Why has out-migration increased for both (taxed and non-taxed) high-income groups? The boom in New Jersey's housing market is a compelling explanation. From the third quarter of 2003 to the first quarter of 2006, housing prices in New Jersey rose by a striking 47 percent. At the peak of the boom (during 2004), New Jersey housing prices rose 10 percent in a single quarter. As Figure 5 shows, these growth rates were also much higher than for the United States as a whole. Prices did not begin to fall until the second quarter of 2007, and then only dropped by 1 percent per quarter until mid-2008. In short, the housing boom is highly collinear with the period of the millionaire tax.

Housing booms increase migration because they make it easy and attractive for people to sell their homes (Zabel, 2009). Indeed, since the housing market collapse in 2008 (and the economic meltdown in general), domestic migration in the United States has hit its lowest rate in at least 60 years (U.S. Census Bureau, 2009). During the boom years of 2003–2007, acute housing price inflation in New Jersey stimulated out-migration (encouraged people to sell their homes) but for the same reason housing costs discouraged in-migration. (Price inflation, we expect, was driven by internal demand, rather than by the small number of in-migrants.) Thus, New Jersey's overheated housing market provides a plausible explanation of why out-migration has increased across the top of the income distribution, regardless of the new tax bracket.

Figure 5

Annual Change in Housing Prices for New Jersey and the United States



Source: Federal Housing Finance Agency, All Transactions Index, http://www.fhfa.gov/Default.aspx?Page=87.

With respect to the validity of the DiD estimator, it is worthwhile to outline potential problems of the analysis. Unobserved heterogeneity is an ever-present issue. We can identify two forms of heterogeneity that would undermine our DiD estimator and obscure our ability to detect a strong tax policy effect on migration. At issue is the presence of some "third variable" that (1) shifts migration trends over time; and (2) has different effects on the treatment and control groups. Unobserved variables that meet these criteria may bias the estimator either upwards or downwards. To substantially change our conclusions, there must be *downward* bias in the estimator. This requires at least one of two conditions for a problematic unobserved "third variable": the variable *raises* migration and affects the *control* but not treatment groups, or the variable *lowers* migration, and affects the *treatment* but not control groups.

One possibility is that persons in the control group, earning just below $500,000, anticipate future income growth that will push them into the new tax bracket (with future income being the unobserved variable). This would mean that the new tax bracket *does* affect the tax rate on their lifetime income, giving people an incentive to migrate. However, if the control group ($200,000–$500,000 per year) expects future income growth, the treatment group (more than $500,000 per year) may have similar expectations as well.

Suppose all households expect their income to rise by 20 percent. For the treatment group, all of their future income growth falls inside the new marginal tax bracket and is taxed at 8.97 percent. For the control group, people making $400,000 would have *none* of their future income growth subject to the millionaire tax, and for those making $450,000, less than half of their income growth is taxed at the higher rate.

Hence, if expectations of future income growth are biasing our results, one would need to assume that the control group anticipates much higher income growth than does the treatment group.

The evidence around income growth expectations for these groups is somewhat mixed. On one hand, the income of the top 1 percent has increased dramatically over the last 30 years. In 1977, the top 1 percent of Americans collected 9 percent of national income; by 2007, their share had nearly tripled to 24 percent (Atkinson, Piketty and Saez, forthcoming). In contrast, our control group (the 95th–99th percentile) nationally has seen only a modest increase in their income share (from 13 percent to 15 percent) over the same period. This suggests that the richest individuals should have the strongest expectations of income growth. This would mean that our estimates are actually too large in magnitude, and that the true policy effect is even smaller than what we report.

On the other hand, there seems to be substantial turnover among the specific individuals that make up the top 1 percent income group. Auten and Gee (2009) linked individuals' federal income tax files across a ten-year period from 1996–2005. Among people who made up the richest 1 percent in 1996, almost 40 percent saw their incomes cut in half by 2005. In contrast, only about 10 percent of the moderately rich (the top 20 percent) saw such a drop in income over the decade, and many more saw increases. The median rich person (from the top 1 percent) saw a 25 percent *drop* in income, while the median moderately-rich person (from the top 20 percent) saw a 15 percent *increase*. Auten and Gee do not report estimates for the income range of our control group (the 95th–99th percentiles), but this suggests that our control group is likely to have stronger expectations of future income growth than the top 1 percent affected by the tax. It is not

clear that these expectations would be high enough to overcome the threshold effect mentioned above — the fact that many need significantly higher income growth before they enter the new marginal tax bracket.

This discussion also helps to explain why the true (rather than just estimated) policy effect is likely to be small. If the population that earns more than $500,000 in a given year is a continuously changing group, then the millionaire tax targets *transitory* spikes rather than *permanent* incomes.[14] In aggregate, it is a tax on the extreme right-tail of the income distribution, but because this group is constantly changing, the tax has only a small effect on any individual's "permanent" tax rate (i.e., the effective tax rate on their permanent income). This, in turn, means that while high incomes are more highly taxed, there are few specific individuals with an incentive to use migration as a way to avoid the tax. In short, the transitory nature of very high incomes improves the efficiency of millionaires' taxes, raising substantial revenues while creating few adverse incentives. Taxes on transitory income spikes are certainly less distortionary (and less migration-inducing) than taxes on permanent incomes.

This is not a bias in our estimate, but rather provides a potential explanation of why the tax seems to have little effect on migration behavior. This also highlights the value of obtaining individual identifiers for our data, linking tax files over time to identify a subset of people that have permanently (or at least continuously) high incomes. Such "permanent" millionaires should be much more sensitive to the tax than "transitory" millionaires. Indeed, this would be an excellent direction for future research.

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[14] Our correspondence with NJ tax officials supports this view. Without citing any specific numbers, they emphasized that many people are subject to the millionaires' tax only for a year or so. Relatively few people continuously earn more than $500,000 per year. Without unique individual identifiers, we are unable to estimate this directly.

Another issue of estimator validity, salient in New Jersey politics, is property taxes. This is a mixed story. Property tax bills increased in each year of our analysis, more so during period two (owing to the housing boom). However, average property tax *rates* — as a percentage of home value — did not fully keep pace, and fell slightly from 2.8 percent to 2.5 percent of home value. It is not clear which quantity residents are more sensitive to: the property tax bill or the property tax rate. In any event, we think property taxes are at best a minor factor in millionaire migration for a key reason: especially in New Jersey, property taxes are steeply regressive. In New Jersey's richest municipalities, property tax rates are very low — in the range of 0.6 percent of home value (one-quarter of the average rate in the state).[15] Relative to income, and factoring in business properties, the top 1 percent of earners in New Jersey pay less than 2 percent in property taxes, compared to 4–6 percent for the bottom 80 percent of earners (Davis et al., 2009). In short, the small shifts in property taxes do not lead to clear migration incentives, particularly for wealthy residents who face a very low rate of property tax.

Finally, a possible concern is that our period of analysis — four years before the tax, and four years after the tax — is insufficient to capture the potentially very long term effects on migration of raising the tax rate. We believe that potential migration effects should happen fairly quickly. When a new tax is imposed, people have an incentive to move as quickly as possible. Immediate migration allows movers a longer period over which to amortize the fixed costs of moving and gives more years to accumulate the benefits of a lower tax regime.

[15] These figures are based on the authors' calculations from public NJ property tax data.

Empirically, studies that report significant migration effects have not required very long-term data. Bakija and Slemrod (2004), looking at estate taxes, found that five-year lagged tax rates produced a slightly larger migration response than current-year tax rates, but the difference in the estimates was not statistically significant. This suggests that migration responses happen quickly. Day and Winer (2006) found that three-year windows were sufficient to capture large migration responses to salient events such as political disruption in Quebec or closing the cod fishery in Atlantic Canada.[16] Finally, Feldstein and Wrobel (1998) report that some 60 percent of their migration effect happened within two years of the tax change, and *all* of their estimated effect occurred within six years; they conclude, "states cannot redistribute income for a period of even a few years" (Feldstein and Wrobel, 1998, p. 396). Thus, we believe that four years of data following the introduction of the millionaires' tax is a substantial window for observing migration effects.

In short, New Jersey's millionaire tax experiment, which generated eight years of NJ-1040 micro-data with over 300,000 observations on millionaires, offers a clear and compelling testing ground for a difference-in-differences analysis of state progressive taxation. In the following section, we translate our results into estimates of the key factors that matter for state policy makers: revenue yield, tax flight losses, and income distribution.

[16] In contrast, provincial tax differences did not lead to observable migration responses even over a period of 17 years (Day and Winer, 2006).

VIII. REVENUE YIELD FROM THE MILLIONAIRE TAX

In Table 4, we provide a simple estimate of how much revenue the state raised from the new tax. To do this, we recalculate taxes payable for each millionaire tax return, comparing the actual taxes with the counterfactual amounts payable under the pre-2004 rate. For example, in 2006, total income taxes payable by millionaire filers was $3.87 billion. Recalculating the tax payable using the pre-2004 tax rules, this would have amounted to $2.79 billion. The difference attributable to the new tax, shown in column three, is $1.08 billion. Such an analysis ignores the possibility that households manipulate their AGI in response to the new tax (Feldstein, 1995; Goolsbee, 2000; Gruber and Saez, 2002), for example by taking greater efforts to hide income, earn less of it, or earn or spend it in tax-favored ways. As such, our estimate of revenues in the counterfactual case may be too low, making these estimates an upper bound.

Table 4

Millionaire Tax Revenue Yield in $Billions

Tax Year	Balance of New Jersey Income Tax (Actual)	Tax Assuming pre-2004 Rates	Millionaire Tax Revenue Yield
2004	2.78	2.04	0.74
2005	3.22	2.36	0.87
2006	3.87	2.80	1.08
Mean	3.29	2.40	0.90

Source: NJDT micro-data.

We also estimate the foregone revenues due to our estimates of tax flight. These numbers are, at best, indicative. When people move away, they do not always take their jobs with them. Particularly when people move out of the region, they may create a "vacancy chain" within employment hierarchies, and set off a series of promotions.

However, in our data we cannot observe the degree to which out-migration creates new income-earning potential for non-migrants. In Table 5, we invoke a simple assumption that out-migration represents lost income and lost tax revenues. Using the DiD estimates from Model 4, we calculate that a loss of 69.7 millionaire tax filers results in losses of $194.7 million in taxable income and $16.4 million in state income tax revenues. These numbers are largely due to the migration response of the top 0.1 percent of tax filers.

Table 5

Millionaire Migration Tax Flight Costs, 2004–2007

Income Level		Tax Filers	Income	Tax Revenues
Amount	Percentile		(millions of 2007 dollars)	
$500,000–$3 million	99–99.9	51.4	48.5	3.6
Above $3 million	Above 99.9	18.3	146.3	12.8
Total		69.7	194.7	16.4

Notes: Estimates assume migrating tax filers earn the mean income for that income level.
Tax revenue costs are based on single filers with no out of state tax credits.
Source: NJDT micro-data.

Finally, we estimate the impact of the new tax on the distribution of income in New Jersey. To do this, we assume that the additional state tax revenues are distributed to the bottom 99 percent of income earners (less the loss due to tax flight). In 2007, without the new tax, the top 1 percent would account for 27.3 percent of total income. With the tax in place, this share falls to 26.9 percent. Thus, the overall effect of the tax is to reduce the share of income held by the top 1 percent by roughly one-half of 1 percentage point. This emphasizes that while state tax policy plays a non-trivial role in determining the after-tax income distribution, it is mostly driven by market earnings.

IX. CONCLUSION

Drawing on a comprehensive set of microdata on individual income taxes in New Jersey — a near census of top income earners — this study examines the impact of a new progressive state income tax. Do progressive state income taxes cause tax flight among the wealthy? The New Jersey millionaire tax experiment offers a potent testing ground, given the magnitude of the policy change and the relative ease of relocating to a different state tax regime without leaving the New York or Philadelphia metropolitan areas. Using a difference-in-differences estimator, we find a minimal effect of the new tax on the migration of millionaires. Using the 95th–99th percentiles of the income distribution as a "non-taxed" control group, we find that the 99th percentile (those subject to the new tax) show much the same trends in migration patterns after enactment of the millionaire tax. There are small subsets of the millionaire population that are more sensitive to state taxation. Nonetheless, the broad conclusion holds even when looking at the richest 0.1 percent of households.

These findings mesh well with existing research that shows that the migration response to marginal tax policy changes is generally quite small. Our work also addresses the question, "are the rich different?" (Alm and Wallace, 2000), and follows the recommendations of Piketty and Saez (2003) to focus on the behavior of the top 1 percent (and even top 0.1 percent) of income earners. We conclude that, at least in terms of the migration response to state income taxes, the rich are *not* different — they seem to have much the same non-response as the general population.

There are, however, at least some rich people that are different. Rich people of retirement age, and rich people who earn their income from investments, are different and

much more sensitive to the millionaire tax. Rich business owners are not different, unless they are extremely rich (top 0.1 percent). Finally, a key source of difference is not wealth, but location of employment. People who work in-state (and thus pay tax on all their employment earnings in-state) are potentially more sensitive to the tax. This is relevant to the generalization of our results: states with more people who work in-state and states with more retired people may experience more tax flight than New Jersey (other things equal). Of course, most other states have geographies much less favorable to low-cost migration. Tax flight from a state like California to a lower tax state is much more costly — in both economic and social respects — than relocating from northern New Jersey to lower-tax southern Connecticut, or from southern New Jersey to even lower-tax Pennsylvania.

Overall, our results suggest that there seems to be little empirical reason why progressive taxation should be the exclusive domain of the federal government (Feldstein and Wrobel, 1998; Leigh, 2008). While in principle it is easier for tax avoiders to migrate out of state than out of country, the reluctance of people to do so gives states significant room to tax top incomes. Indeed, we estimate that New Jersey's new tax raises nearly $1 billion per year and tangibly reduces income inequality, with little cost in terms of tax flight.[17]

Future research could expand the difference-in-differences estimation strategy by incorporating comparable states that did not impose a millionaire tax, such as

[17] There is, of course, some level of progressive taxation that would provoke substantial millionaire migration. It is not clear what that level is for New Jersey, much less for other states. Raising the top marginal tax rate by 2.6 percentage points led to a loss of less than one-tenth of 1 percent of the stock of millionaires. However, it is unlikely that, say, a 10 percentage point tax increase would have a linearly proportional effect (i.e., a loss of four-tenths of 1 percent).

Connecticut (a comparable state within the New York metro area). This would allow a multiple difference-in-differences estimator, offering a comparison of three non-taxed control groups, $NJ_{(under\ 500k)}$, $CT_{(under\ 500k)}$, $CT_{(over\ 500k)}$, with the treatment group $NJ_{(over\ 500k)}$. This would be especially valuable if the underlying migration trends are fundamentally different for the top percentile than they are for the 95th–99th percentile. With data from multiple states, one could use synthetic control methods, along the lines described by Abadie, Diamond, and Hainmueller (2007), to quantify the uncertainty associated with any particular control group.

Further, a number of other states have recently passed millionaire taxes (including New York, California, Maryland, Hawaii, Wisconsin, and Oregon), offering great potential for comparative study. Oregon, in particular, is a state that deserves research attention in the future: in 2009, Oregon established the highest marginal tax rate in the country (11 percent on incomes over $225,000), while its neighbor Washington continues to have no state income tax at all.[18] Moreover, Oregon and Washington share a major metropolitan area (Portland-Vancouver), suggesting strong potential for regional tax competition. Feldstein and Wrobel (1998) would predict that the future of this city is to become the Vancouver-Portland metropolitan area (with the wealthy population migrating from the Oregon to the Washington side). The results here, in contrast, suggest that Oregon will achieve lower income inequality and obtain greater resources for public services.

[18] In contrast, Washington has a 6.5 percent sales tax while Oregon has no sales tax at all. This means that Oregon has much lower taxes on the poor, and much higher taxes on the wealthy (Davis et al., 2009).

The present difficulty in obtaining state income tax records is a severe constraint in developing knowledge about state tax policies. We were granted rare access to the New Jersey data, but could not obtain unique individual identifiers that would allow us to follow non-migrant tax filers over time.[19] Nor have we been able to access micro-data from New York or Connecticut. We strongly advocate an initiative to "liberate" state tax data, by housing these data in a central location with a standardized confidentiality agreement and a process for IRB approval.[20]

[19] It is worth noting that the New Jersey Division of Taxation has been under-staffed for years.

[20] The Stanford Secure Data Center – which specializes in managing sensitive and confidential federal government data — is an excellent example of how to facilitate researcher access to data that cannot be made publicly available. State tax departments could easily include, as part of their annual reporting process, an upload to the Secure Data Center. Even if only a dozen states agreed to participate, this would greatly increase data availability and allow many innovative studies of state fiscal policies. Participating states, in turn, would benefit from a multitude of research studies that would facilitate a more evidence-based policy process.

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REFERENCES

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller, 2007. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." NBER Technical Working Paper No. 0335. National Bureau of Economic Research, Cambridge, MA.

Alm, James, and Sally Wallace, 2000. "Are the Rich Different?" In Slemrod, Joel (ed.), *Does Atlas Shrug?: The Economic Consequences of Taxing the Rich*, 165–187. Russell Sage Foundation, New York, NY.

Atkinson, Anthony, Thomas Piketty, and Emmanuel Saez, forthcoming. "Top Incomes in the Long Run of History." *Journal of Economic Literature*.

Auten, Gerald, and Geoffrey Gee, 2009. "Income Mobility in the United States: New Evidence from Income Tax Data." *National Tax Journal* 62 (2), 301–328.

Bakija, Jon, and Joel Slemrod, 2004. "Do the Rich Flee from High State Taxes? Evidence from Federal Estate Tax Returns." NBER Working Paper No. 10645. National Bureau of Economic Research, Cambridge, MA.

Bertrand, Marianne, Ester Duflo, and Sendhil Mullainathan, 2004. "How Much Should We Trust Difference-In-Differences Estimates?" *The Quarterly Journal of Economics* 119 (1), 249–275.

Bound, John, David A. Jaeger, and Regina Baker, 1993. "The Cure Can Be Worse than the Disease: A Cautionary Tale Regarding Instrumental Variables." NBER Technical Working Paper No. 0137. National Bureau of Economic Research, Cambridge, MA.

Caspersen, Erik, and Gilbert Metcalf, 1994. "Is a Value Added Tax Regressive? Annual Versus Lifetime Incidence Measures." *National Tax Journal* 47 (4), 731–746.

Coomes, Paul A., and William H. Hoyt, 2008. "Income Taxes and the Destination of Movers to Multistate MSAs." *Journal of Urban Economics* 63 (3), 920–937.

Dahl, Michael S., and Olav Sorenson, 2010. "The Social Attachment to Place." *Social Forces* 89 (2), 633–658.

Davis, Carl, Kelly Davis, Matthew Gardner, Robert S. McIntyre, Jeff McLynch, and Alla Sapozhnikova, 2009. *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*. Institute on Taxation & Economic Policy, Washington, DC.

Day, Kathleen M., and Stanley L. Winer, 2006. "Policy-Induced Internal Migration: An Empirical Investigation of the Canadian Case." *International Tax and Public Finance* 13 (5), 535–564.

Donald, Stephen G., and Kevin Lang, 2007. "Inference with Difference-in-Differences and Other Panel Data." *The Review of Economics and Statistics* 89 (2), 221–233.

Feenberg, Daniel, 2010. "TAXSIM Related Files at the NBER." National Bureau of Economic Research, Cambridge, MA, http://www.nber.org/taxsim/.

Feenberg, Daniel R., and Elizabeth Coutts, 1993. "An Introduction to the TAXSIM Model." *Journal of Policy Analysis and Management* 12 (1), 189–194.

Feenberg, Daniel R., and James M. Poterba, 1993. "Income Inequality and the Incomes of Very High-Income Taxpayers: Evidence from Tax Returns." In Poterba, James M. (ed.), *Tax Policy and the Economy Volume 7*, 145–177. National Bureau of Economic Research, Cambridge, MA.

Feldstein, Martin, 1995. "The Effects of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act." *Journal of Political Economy* 103 (3), 551–572.

Feldstein, Martin, and Marian Wrobel, 1998. "Can State Taxes Redistribute Income?" *Journal of Public Economics* 68, 369–396.

Fullerton, Don, and Gilbert E. Metcalf, 2002. "Tax Incidence." In Auerbach, Alan J., and Martin Feldstein (eds.), *Handbook of Public Economics, Volume 4*, 1787–1867. North-Holland, Amsterdam, Netherlands.

Gensler, Howard, 1996. "The Effect of Welfare on Migration." *Social Science Research* 25 (3), 281–291.

Goolsbee, Austan, 2000. "What Happens When You Tax the Rich? Evidence from Executive Compensation." *Journal of Political Economy* 108 (2), 352–378.

Gruber, Jon, and Emmanuel Saez, 2002. "The Elasticity of Taxable Income: Evidence and Implications." *Journal of Public Economics* 84 (1), 1–32.

Kaestner, Robert, Neeraj Kaushal, and Gregg Van Ryzin, 2003. "Migration Consequences of Welfare Reform." *Journal of Urban Economics* 53 (3), 537–576.

Kahneman, Daniel, Alan B. Krueger, David Schkade, Norbert Schwarz, and Arthur Stone, 2004. "Toward National Well-Being Accounts." *American Economic Review* 94 (2), 429–434.

King, Gary, Robert O. Keohane, and Sidney Verba, 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press, Princeton, NJ.

Leigh, Andrew, 2008. "Do Redistributive State Taxes Reduce Inequality?" *National Tax Journal* 61 (1), 81–104.

Levine, Phillip B., and David J. Zimmerman, 1999. "An Empirical Analysis of the Welfare Magnet Debate Using the NLSY." *Journal of Population Economics* 12 (3), 391–409.

Liebig, Thomas, Patrick Puhani, and Alfonso Sousa-Poza, 2006. "Taxation and Internal Migration: Evidence from the Swiss Census Using Community-Level Variation in Income Tax Rates." IZA Discussion Paper No. 2374. Forschungsinstitut zur Zukunft der Arbeit, Bonn, Germany.

McCloskey, Deirdre N., and Stephen T. Ziliak, 1996. "The Standard Error of Regression." *Journal of Economic Literature* 34 (1), 97–114.

Mirrlees, James A., 1982. "Migration and Optimal Income Taxes." *Journal of Public Economics* 18 (3), 319–341.

Office of the Govenor, 2004. "Govenor McGreevey Signs Property Tax Relief Bill." Office of the Governor, Trenton, NJ, http://www.njstatelib.org/NJLH/lh2004/govmess/ch40gov.pdf.

Piketty, Thomas, and Emmanuel Saez, 2003. "Income Inequality in the United States, 1913–1998." *Quarterly Journal of Economics* 118 (1), 1–39.

Piketty, Thomas, and Emmanuel Saez, 2007. "How Progressive is the U.S. Federal Tax System? A Historical and International Perspective." *Journal of Economic Perspectives* 21 (1), 3–24.

Saez, Emmanuel, Joel Slemrod, and Seth Giertz, 2009. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." NBER Working Paper No 15012. National Bureau of Economic Research, Cambridge, MA.

Slemrod, Joel, 2000. "The Economics of Taxing the Rich." In Slemrod, Joel (ed.), *Does Atlas Shrug?: The Economic Consequences of Taxing the Rich*, 3–28. Russell Sage Foundation, New York, NY.

Stanek, Steve, 2008. "Md. Millionaires Hit by Tax Bracket for Wealthy." *Budget and Tax News*, July. The Heartland Institute, Chicago, IL, http://www.heartland.org/policybot/results/23325/Md_Millionaires_Hit_by_Tax_Bracket_for_Wealthy.html

Thompson, Jeffrey P., 2009. "Costly Migration and the Incidence of State and Local Taxes." Working Paper. Syracuse University, Syracuse, NY.

U.S. Census Bureau, 2009. "Residential Mover Rate in U.S. is Lowest Since Census Bureau Began Tracking in 1948." Census Bureau, Washington, DC, http://www.census.gov/newsroom/releases/archives/mobility_of_the_population/cb09-62.html.

Wildasin, David, 1993. “State Income Tax with Mobile Labor.” *Journal of Policy Analysis and Management* 12 (1), 51–75.

Winkelmann, Liliana, and Rainer Winkelmann, 1998. “Why Are the Unemployed So Unhappy? Evidence from Panel Data.” *Economica* 65 (257), 1–15.

Young, Cristobal, 2009. “Model Uncertainty in Sociological Research: An Application to Religion and Economic Growth.” *American Sociological Review* 74 (3), 380–397.

Zabel, Jeffery, 2009. “The Role of the Housing Market in the Migration Response to Employment Shocks.” NEPPC Working Paper 09-2. New England Public Policy Center, Federal Reserve Bank of Boston, Boston, MA.

Zodrow, George R., 2007. “The Property Tax Incidence Debate and the Mix of State and Local Finance of Local Public Expenditures.” *CESifo EconomicStudies* 53 (4), 495–521.

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Chapter 4.

Millionaire Migration and the Taxation of the Elite:

Evidence from Administrative Data

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Key words: elites, migration, income tax, administrative data, regression discontinuity.

Abstract

A growing number of U.S. states have adopted millionaire taxes on top income earners. This increases the progressivity of state tax systems, but raises concerns about tax flight: elites migrating from high-tax to low-tax states, draining state revenues and undermining redistributive social policies. Are top income earners "transitory millionaires" searching for lower-tax places to live? Or are they "embedded elites" that are reluctant to migrate away from places where they have been highly successful? This question is central to understanding the social consequences of progressive taxation. We draw on administrative tax returns for all million-dollar income earners in the United States over 13 years, tracking the state from which millionaires file their taxes. Our data set contains 45 million tax records and provides census-scale panel data on top income earners. We advance two core analyses: (1) state-to-state migration of millionaires over the long-term, and (2) a sharply-focused discontinuity analysis of millionaire population along the borders of states. We find that millionaire tax flight is occurring, but only at the margins of statistical and socio-economic significance.

1. Introduction

Rising income inequality is one of the deepest challenges facing American society in the 21st century (Keister 2014; McCall and Percheski 2010; Piketty 2014; Volscho and Kelly 2012). Yet there have been few clear policy responses to growing inequality. Indeed, over the last three decades, federal tax policy has shifted away from the taxation of the elite, reducing tax rates on top incomes, capital gains, and multi-million dollar inheritances – a process to "untax the one percent" (Martin 2013; Piketty and Saez 2007).[1] Increasingly, state governments have been tempted to fill this void with "millionaire taxes" on top incomes (Young and Varner 2011). In essence, states have been "going where the money is" to find new revenues at the very top of the income distribution (Fairfield 2013:42; Volscho and Kelly 2012; Piketty and Saez 2007).

Taxation, as Morgan and Prasad emphasize, "is one of the central social obligations of the modern world" (2009: 1350). However, the size of this tax obligation varies over time and place, and is subject to political negotiation and unintended consequences such as tax migration. This may be particularly true for the highest income earners, who have marketable skills and deep pockets to invest in relocation. In a federal system with free migration, can different states sustain significantly different policies of elite taxation? Understanding how the demography of the elite responds to progressive taxation is central to the sociology and political economy of taxation.

[1] As noted in Chapter 1, Congress has since 2010 begun to reverse this process at the federal level. In particular, the Affordable Care Act (ACA) included a new 3.8 percent Medicare tax limited to the interest, dividends, and capital gains of individuals with incomes over $200,000 (Starr 2015).

In a globalizing world, many countries and regions are concerned about capital flight and the migration of top taxpayers. The United States provides an ideal empirical testing ground: a "world" comprised of 51 small open economies with free migration between them (cf., Fligstein and Mara-Drita 1996). Millionaire migration across U.S. states sheds light on how, with the ongoing advancement of globalization, top international tax rates may affect the geographic distribution of the world's elites.

Millionaire taxes provide revenue to support public services and serve to moderate the growing inequality in market incomes. However, millionaire migration – the flight of the largest taxpayers – can drain state revenues and undermine state-level redistributive social policies (Mirrlees 1982; Feldstein and Wrobel 1998). The potentially out-sized impact of millionaire migration on state tax revenues may be one mechanism by which elites exert disproportionate influence over state policy (Khan 2012; Page, Bartels, and Seawright 2013; Dobbin, Simmons and Garret 2007; Martin 2010). Indeed, the threat of millionaire migration is powerful leverage in an "exit versus voice" political negotiation over top tax rates (Carruthers and Lamoreaux 2013; Hirschman 1970).

We contrast two core perspectives on millionaire migration. The "transitory millionaire" hypothesis presents top income earners as highly mobile actors searching for lower-tax places to live. The "elite embeddedness" hypothesis, in contrast, suggests that most top income earners have strong social and economic ties to place, making it difficult to move away from places where one has achieved exceptional success. These perspectives offer two very different views on the likelihood of tax-induced migration, and thus on the social consequences of progressive taxation.

We develop a new framework and critical data set for demographic analysis of the elite, and apply it to understanding elite response to tax policy. Elites are difficult to study using conventional data sources. However, they must file their taxes – providing census-scale, panel data on how much they earn and where they live (cf. Piketty and Saez 2003; Chetty et al. 2014). This study draws on restricted IRS data on the tax returns filed by all million-dollar income earners in all U.S. states between 1999 and 2011. The panel nature of the data allows us to track the state and county from which millionaires file their taxes.

Previous studies on elite tax flight have struggled with data limitations either by using narrow segments of the millionaire population (such as professional athletes) or by analyzing narrow geographic regions (such as one or two U.S. states). A study of the migration of elite European soccer players (Kleven, Landais, and Saez 2013) found clear evidence of top players moving away from teams in high-tax countries. However, athletes are not representative of top income earners in general, and for demographic and occupational reasons are probably an especially mobile segment of elite earners (as the authors note, ibid:1923). In the United States, studies have used administrative data on the full population of millionaires, examining the effect of natural experiments in raising or lowering millionaire taxes (Young and Varner 2011; Varner and Young 2012). These studies found little or no elite migration response to top tax rates. However, these studies were limited to two U.S. states (New Jersey and California) that have high concentrations of millionaires and locational advantages that, compared to other states, may allow greater capacity to tax the rich.

This study provides an ideal combination of the broad-geography, multi-state lens of Kleven, Landais, and Saez (2013), and the scaled-up administrative data of Young and Varner (2011). We draw on data on all millionaire earners, from all occupations, across 50 states and the District of Columbia. This allows new analyses that give a comprehensive understanding of how top tax rates affect millionaire demography. First, we focus on millionaire migration in response to progressive state income taxes. Is there a pattern of millionaires moving from high-tax to low-tax states? Are the migration patterns of the elite different from those of the general population? Second, we analyze millionaire population along the borders of states. Do millionaires tend to cluster on the low-tax side of state borders? This provides a sharply-focused regression discontinuity analysis of border-county regions, examining small geographic zones where tax responsiveness should be most visible (Keele and Titiunik 2014).

We find that millionaire migration is indeed responsive to top income tax rates. However, the magnitude of the migration response is small, and has little effect on the millionaire tax base. The implied revenue-maximizing tax rates on top incomes are much higher than current state policies – upwards of 68 percent on incomes above $1 million. Moreover, evidence for tax flight rests entirely on high migration rates into Florida, and not to any other low-tax state. Finally, when we focus on the border regions of states, we do not find compelling evidence that millionaires cluster on the low-tax side of state borders. Elites are embedded in the regions where they achieve success, and have limited interest in changing where they live to procure tax advantages.

2. The Challenges of Elite Taxation

Americans generally support the principle of reducing inequality, but remain ambivalent over how to do it (McCall 2012; Page, Bartels, and Seawright 2013). There are intense debates over how to fund programs that reduce inequality and support economic opportunity (Morgan and Prasad 2009; Martin 2008; Kenworthy 2014; Newman and O'Brien 2011; Prasad 2014). From a political economy perspective, flat taxes on sales and consumption may be more politically viable and help to sustain elite support for safety net policies. European counties, for example, tend to rely heavily on flat taxes to finance broad welfare states (Prasad 2014; Morgan and Prasad 2009). In contrast, progressive income taxes may be more politically polarizing, but offer the potential of greater redistribution of income and economic opportunity across socio-economic classes (Martin and Prasad 2014; Fairfield 2013).

A central question in these debates is whether some regions can have systems of elite taxation when others do not. In an open economic system with free migration, states will face pressure to reduce the tax burden on highly mobile residents, and increase the tax burden on the less mobile (Slemrod 2010). Indeed, Feldstein and Wrobel (1998) argue that progressive income taxes at the state level are quickly self-defeating. In principle, raising taxes on the wealthy and providing transfers and services to the poor directly reduces inequality in a state. However, in a context of free migration, states will see an out-migration of top income earners (fleeing taxes) and an in-migration of the poor (seeking services). For the state's labor market, this means a shortage of high-skill workers and an oversupply of low-skill workers. In response, the market bids up wages

for high-skill workers, and bids down wages for low-skill workers. Inequality in the state returns to its initial, equilibrium level.

Tax flight is closely related to questions of how economic globalization creates pressures for an international race to the bottom in social welfare states (Brady, Beckfield and Seeleib-Kaiser 2005; Brady, Beckfield and Zhao 2007; Beckfield 2013). Over the 20th century, distinct varieties of capitalism and social welfare states have coexisted among developed countries (Hicks and Kenworthy 2003; Esping-Andersen 1990). At least in Europe, this variety has narrowed over the last two decades. "E.U. citizens in various countries are living in an increasingly similar welfare regime" – primarily one that offers fewer social protections than in the past (Beckfield 2013:99). This convergence suggests that greater economic integration and market openness limits the range of viable socio-economic policies.

The Transitory Millionaire Hypothesis

The view that millionaires are highly mobile has gained much political traction in recent years, and has become a central argument in debates over millionaire taxes. Before Oregon voters approved a new millionaire tax, Nike chairman Phil Knight predicted the tax would set off a "death spiral" in which "thousands of our most successful residents will leave the state" (Knight 2010). In Washington State, a millionaire tax referendum was defeated after opposition from the state's top companies: Microsoft warned that the tax would "make it harder to attract talent" while Boeing stated the tax would "erode Washington state's competitiveness" (Garber 2010). New Jersey Governor Chris Christie

simply declared “Ladies and gentlemen, if you tax them, they will leave” (Office of the Governor 2010).[2]

In some areas, compelling evidence shows that tax and regulatory discontinuities along the borders of states lead to migration-like reactions, including changes in the location of sales, manufacturing, and corporate domiciles. Sales and excise taxes, for example, frequently lead to cross-border shopping (Goolsbee, Lovenheim, and Slemrod 2010; Merriman 2010). In online shopping, the effects of sales taxes appear quite strong. Analysis of eBay.com transactions show that online shoppers avoid buying from retailers located in states with high sales taxes, indicating that such taxes “play a significant role in shaping the geography...of online retail trade” (Einav et al. 2014:1). Similarly, corporations tend to incorporate or “domicile” in states with minimal regulatory restrictions or tax burdens. An overwhelming number of large American firms are incorporated in Delaware, even when their operations and physical headquarters are located elsewhere (Carruthers and Lamoreaux 2013; see also Homes 1998). Internationally, corporate inversion strategies allow U.S. companies to shift their legal address to a foreign country with preferred regulatory and tax structures (Marples and Gravelle 2014; Marian 2015). Individuals with high incomes may deploy similarly sophisticated strategies to arbitrage state borders and locate in low-tax states.

[2] Similar arguments are common in Europe. Debate was especially heated in 2013, after the French actor Gerard Depardieu renounced his citizenship and moved to Russia to avoid the high French tax burden. Russia’s Deputy Prime Minister Dmitry Rogozin, commenting on his country’s flat 13 percent income tax, remarked “The West has an especially poor knowledge of our tax system. When they learn about it, we expect a mass migration of wealthy Europeans to Russia” (Quoted in Erb 2014).

The Elite Embeddedness Hypothesis

There is, however, reasonable skepticism about the ready mobility of the elite. In principle, top-income earners are mobile in the sense that they have fewer financial constraints on where they choose to live. In practice, their actual migration patterns may or may not be particularly high or sensitive to tax rates. We note two core factors that may embed elites in their regions and states: lifecycle constraints and place-specific social capital.

First, millionaires are not typically at a lifecycle stage where migration is common (Geist and McManus 2008). The top one percent are primarily the "working rich" who have employers and derive most of their income from wages and salaries (Piketty and Saez 2003). In general, high income earners are more likely to be married, to be in a dual-career household (Alm and Wallace 2000; Schwartz 2013), to have school-age children, to own rather than rent their home, and to own a business – all factors that discourage migration (Geist and McManus 2008; Young and Varner 2011; Hernadez-Murillo et al. 2011; Molloy, Smith and Wozniak 2011; Kiester 2014:356-7). College-educated workers are more mobile than those with less education (Hernández-Murillo et al. 2011; Wozniak 2010). However, migration tends to occur early after graduation, when income is lowest, rather than at the advanced career stage when income is highest. And millionaires are unlikely to be unemployed and searching for work – a key factor that encourages migration. Thus, elite income earners tend to have many social attributes that deter migration, and fewer attributes that encourage migration.

Second, the socio-economics of location points to tangible limits on the easy migration of elite income-earners. Tax-induced migration models typically assume that income is

exogenous to location, and that it does not depend on social or economic ties to place (Simula and Tannoy 2011; Mirrlees 1982). However, most millionaires are at their peak years of earnings, and are drawing on long personal investments in a career or business line from which they cannot easily migrate away (Saez 2013; Varner and Young 2012). Income-earning capacity derives not just from individual talent and human capital (which is movable) but also from *place-based social capital* – social and business connections to colleagues, collaborators, funders, and co-founders.

Entrepreneurs, for example, tend to cluster and thrive in their "home" markets where they have deep roots, social ties, and accumulated local market knowledge (Dahl and Sorenson 2009; 2012; Sorenson and Audia 2000; Michelacci and Silva 2007). Co-founders and other allies are often critical to a successful entrepreneurial enterprise (Ruef, Aldrich and Carter 2003). Moreover, successful team work is difficult to accomplish without face-to-face interaction and co-presence. Despite modern communications technology, distance is still an impediment to communication, collaboration, information-sharing, and trust (Olsen and Olsen 2000). When economic success is a joint product – rather than a purely individual accomplishment – there is a difficult network coordination problem for migration: one's own willingness to migrate for tax purposes must align with that of co-founders, collaborators, and perhaps even clients (Young and Lim 2014). Migrating away from these social connections is costly. "Unlike human capital, which entrepreneurs carry with them wherever they go, social capital depreciates as one transports it from the regions in which it had been developed" (Dahl and Sorenson 2012:1061).

Those who achieve top incomes, in this view, are deeply embedded insiders who yield remarkable returns in part because of their social placement in a localized economic world. Top-level income status makes players more, rather than less, bound to the regional economy.

The embeddedness of earning potential means that those making $1 million a year in Silicon Valley or Manhattan often cannot leave those regions without a (potentially large) drop in income (Saxenian 1994; Powell et al. 2002; Baldwin and Krugman 2004). Elites become enmeshed in the regions where they make their fortunes, and are increasingly tied to those regions for their best economic opportunities.

Existing Evidence on Elite Mobility and Tax Flight

Are top income-earners "transitory millionaires" searching for lower-tax places to live? Or are they "embedded elites" that are reluctant to migrate away from places where they have been highly successful? The evidence so far on elite mobility and tax flight is limited and equivocal. The world's billionaires, for example, appear quite grounded in their home countries, with some 87 percent residing in their country of birth (Sanandaji 2013). Moreover, the few billionaires who have moved were more likely to migrate to large market economies such as the United States, than to tax havens like Monaco (ibid). Among the world's top physicists, however, only about 50 percent live in their country of birth, indicating high mobility among top academics and a problem of "brain drain" facing many small countries (Hunter, Oswald, and Charlton 2009; Zucker and Darby 2007). Yet, academia appears to be an unusually mobile profession.

A few studies have specifically addressed the role of income taxes in elite mobility. In Europe, economists Kleven, Landais, and Saez (2013) study the migration of elite European soccer players, finding clear evidence of migration of players towards teams in low-tax countries. After restrictions on foreign players were lifted in 1996, top players migrated from teams in high-tax countries (such as France and Sweden) to teams in low-tax countries (England or the Netherlands). Teams in low-tax countries were "better able to attract good foreign players and keep good domestic players at home" (ibid: 1905). They note, however, that European soccer players are a "particularly mobile segment of the labor market," suggesting that their results represent an "upper bound on the migration response" (ibid: 1923).

In the United States, there have been two studies of natural experiments in taxing millionaires in New Jersey and California (Young and Varner 2011; Varner and Young 2012). These studies use micro-data from state income tax records to measure millionaire migration before and after changes in the top tax rate. They find that increases in the top tax rate had little effect on millionaire migration, raised substantial revenues (on the order of $1 billion annually in both states), and modestly reduced income inequality. A skeptical replication of the New Jersey study (Cohen, Lai and Steindel 2015) found similar migration effects, narrowing the question to whether that state's millionaire tax migration is small, or very small (Young and Varner 2015). However, these two states may be unrepresentative of the United States as a whole.

3. Data

This article uses confidential Internal Revenue Service tax return information to examine how top tax rates influence elite migration. Our data selects all federal income tax filers with reported earnings of $1 million or more in any year between 1999 and 2011. The data provides 45 million tax records, representing 13 years of panel data on 3.7 million unique tax filers, yielding census-scale evidence on the top income-earners in America. We obtain annual income as reported on 1040 tax returns, and adjust incomes for inflation to constant 2005 dollars. Tax filers who ever report annual income of at least $1 million are pulled into our dataset and we track their income and residency for the full 13 years regardless of annual income in any other year. On average, we have 12.5 years of tax returns for each tax filer. The unit of analysis is tax records, which often includes married couples filing jointly. For simplicity, we refer to millionaire tax returns as "millionaires". While the term "millionaire" often connotes accumulated wealth, our focus is on top annual incomes – those who earn in one year what few ever accumulate in wealth (Keister 2014).

For comparison, we also draw a one percent sample of the total population of tax filers. This gives us an additional 24 million tax records from 2.6 million unique filers from across the income distribution. This allows us to ask, are the rich different? Do they have higher migration rates than the general population? Is elite migration more sensitive to income tax rates?

State residency in each year comes from the home address reported on the 1040 form. Migration is identified by changes in the state from which households file their federal

taxes. For example, suppose an individual files their tax return from New York in 2005, and then files from Florida in 2006. Such individuals are simultaneously classed as out-migrants from New York, and in-migrants to Florida. Millionaire migration is defined by those who earned $1 million or more in year *t*, and changed their state of residency between years *t* and *t+1*. From this, we construct a state-to-state matrix of millionaire migration, which shows migration flows between each possible pairing of states, such as New York to Florida, New York to California, etc.

State income tax rates are drawn from the NBER's Taxsim program (Feenberg and Coutts 1993), estimating the combined federal and state effective income tax rate for couples earning $1.7 million in labor income (the median income of millionaires in our data), taking into account the cross deductibility of federal and state taxes (Stark 2003).[3] We also use state-level data on a range of characteristics relevant to residential desirability. These include sales and property taxes, which are the core revenue sources for states with low income taxes. Economic conditions are captured with state per capita income and the unemployment rate. Finally, we include the price of residential land in each state (Davis and Heathcote 2007). This measure subtracts out the "structure cost" of home prices, focusing on the intuition that land prices reflect the market value of a home's location (ibid:2595). These variables aim to capture factors that influence migration and may be correlated with the adoption of elite income tax rates. Appendix A lists our variables, descriptive statistics, and sources.

[3] We also examine the tax rates of those earning 50 percent and 100 percent of their income through capital earnings, to measure state-level tax advantages for capital. We do not find clear effects for capital tax rate differences, and do not report these models.

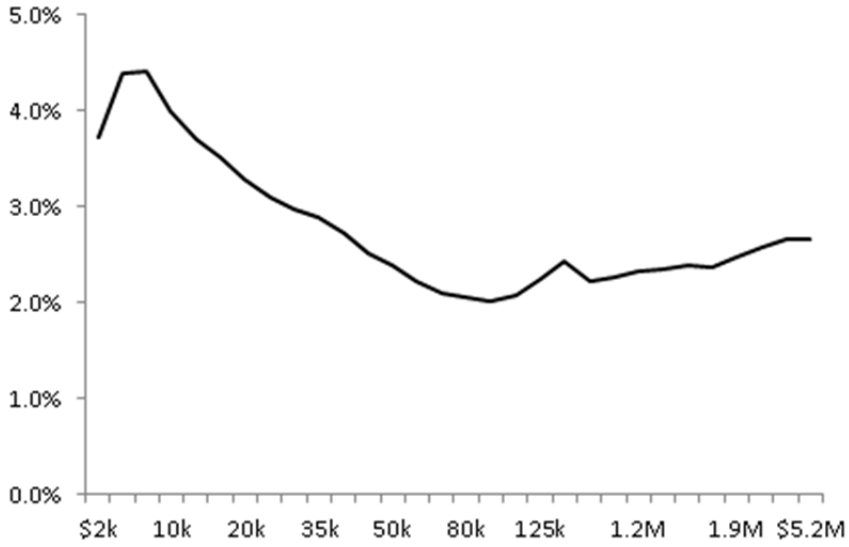
3.1 Basic Facts

Little is known about the migration patterns of the rich and their broader demography. We begin our analysis by describing the core empirical facts of elite mobility.

In any given year, roughly 500,000 households file tax returns reporting $1 million or more (constant 2005 dollars). From this population, only about 12,000 millionaires change their state in a given year. The annual millionaire migration rate is 2.4 percent, which is lower than the migration rate of the general population (2.9 percent). Figure 1 shows the income-migration curve over the whole distribution of income, as income rises from nearly zero to millions of dollars per year. The highest rates of migration are seen among low income tax filers: migration is 4.5 percent among those who earn around $10,000.[4] The migration rate drops steadily with income, and migration is lowest (2.0 percent) for those making around $90,000. Above this point, and into millionaire-level incomes, we see a curvilinear effect: migration rates begin to rise again, but only gradually. The migration rate of those making $5 million or more is still only 2.7 percent. The elite are mobile only relative to the upper-middle class. Overall, higher income earners show greater residential stability than do low income earners.

[4] One concern with using tax data on low-income earners is that not all need to file tax returns. However, the Earned Income Tax Credit (EITC) leads most families with children to file a tax return even if they do not owe taxes (Jones 2014). Unattached individuals have lower filing rates. Such individuals are also more mobile than families with children. This pattern of non-filing suggests that, if anything, we are underestimating the migration rates of the poor.

Figure 1. Migration Rates by Income Level, 1999-2011



Source: U.S. Department of the Treasury, IRS Micro Data. One percent sample of all tax filers (N = 24 million), and 100 percent sample of those making $1 million or more (N = 45 million).

What factors help explain low migration among elite earners? Basic social and economic characteristics are observable from tax returns, including marital status, dependent children, age 65 or older, and ownership of a business. In Table 1, we examine basic evidence of embeddedness – factors that ground people in their states and lower their migration rates.

Marital status stands out as a prominent factor in millionaire migration. Single individuals have roughly twice the migration rate of married couples (4.1 percent versus 2.2 percent), and a similar pattern is seen for the general population. However, nearly all millionaires are married (90 percent, compared to only 58 percent of the general population). Similarly, millionaires are more likely to have children at home (50 percent, compared to 40 percent among the general population). High levels of family responsibilities – marriage and children – ground elites in their communities and states.

Business ownership is also a strong embedding factor. Among millionaires, those who own a business have a migration rate of 2.0 percent, well below that of non-business owners (2.6 percent). A similar pattern – but even stronger difference – is seen in the general population: business owners have strong economic attachment to where they live. Notably, millionaires are much more likely to own a business (23 percent) than the population overall (4 percent), making business ownership an important distinguishing factor that embeds millionaires in their states.

Table 1: Migration Rates by Socio-Economic Group

	Millionaires		All Population	
	Migration Rate	Share of sample	Migration Rate	Share of sample
Overall	2.4%	100%	2.9%	100%
Married, filing jointly	2.2%	90%	2.3%	58%
Single / non-joint filer	4.1%	10%	3.7%	42%
Difference	-1.8%**		-1.4%**	
One child or more	2.0%	50%	2.5%	40%
No children	2.9%	50%	3.3%	60%
Difference	-0.9%**		-0.8%**	
Age 65 +	2.2%	20%	1.6%	15%
Under age 65	2.5%	80%	3.1%	85%
Difference	-0.2%*		-1.4%**	
Business owner	2.0%	23%	1.6%	4%
Not business owner	2.6%	77%	2.9%	96%
Difference	-0.5%**		-1.4%**	

Note: * $p<0.05$ ** $p<0.01$, using robust standard errors clustered by state. One percent sample of all tax filers (N = 24 million), and 100 percent sample of those making $1 million or more per year (N = 45 million). Source: U.S. Department of the Treasury, IRS Micro Data, years 1999-2011.

These simple findings do not bode well for the transitory millionaire hypothesis. Millionaires have lower migration rates than the general population, and are rooted in their states by the ties of family responsibilities, business ownership, and ultimately by high income itself.

However, these descriptive facts do not speak directly to the dynamics of tax flight. Despite low migration rates, millionaires may still be keenly focused on ensuring that migration leads them to a lower-tax state. To understand this, we turn to the rich evidence found in the state-to-state migration flows of millionaire earners.

4. State-to-State Millionaire Migration Flows

In this section, we analyze long-run millionaire migration flows between all states and the District of Columbia over 13 years, using both simple and complex models.[5] There are longstanding differences in state tax rates. For example, Florida, Texas, and Nevada have never had an income tax, while New York, New Jersey, and California have long had progressive tax regimes. Over the long-term, is there a general pattern of millionaires moving from high-tax to low-tax states?

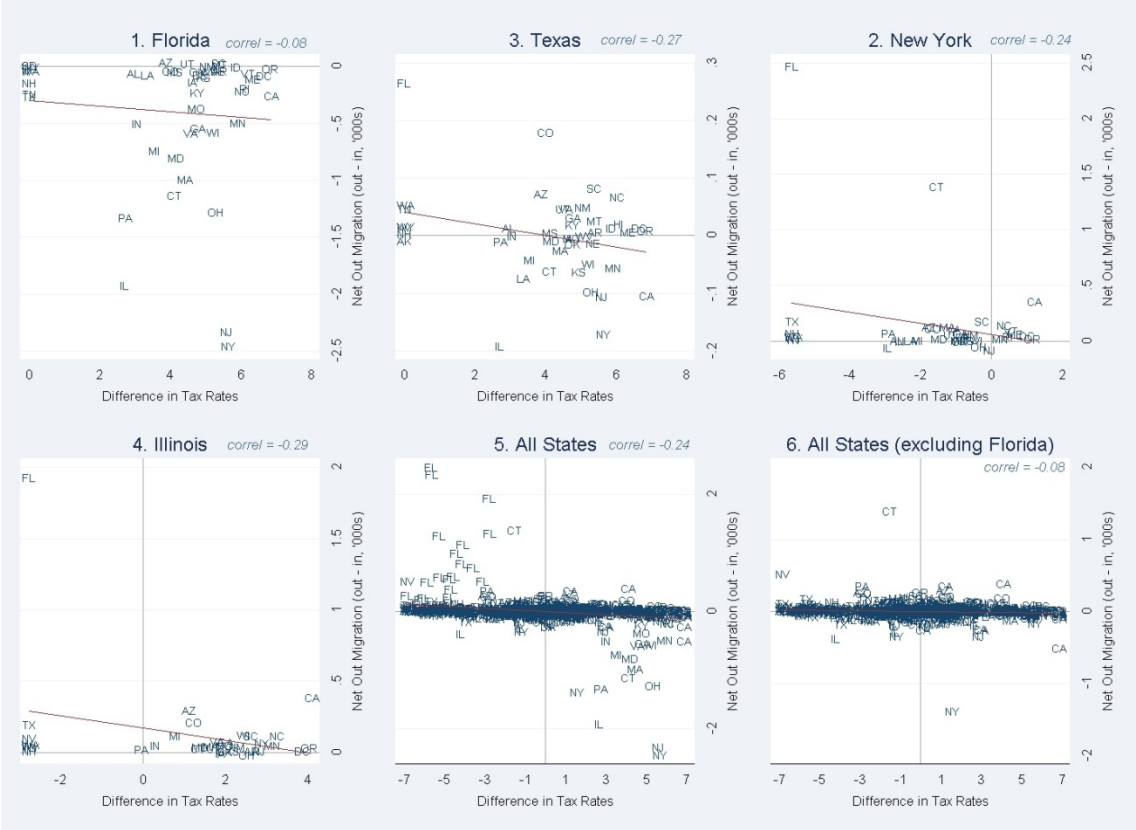
First, we illustrate our analysis intuitively using raw migration data, after which we proceed to formal log-linear gravity models of migration. Figure 2 shows net out-migration flows of millionaires for several key states, plotted against the tax differences between the states. The x-axis shows whether other states have lower (-) or higher (+)

[5] Similar models have been applied to census data by Herting, Grusky, and Rompaey (1997), to international migration by Beine, Docquier, and Ozden (2011), and to elderly migration in the United States by Conway and Rork (2012). Santos Silva and Tenreyo (2006) provide an excellent discussion of the core model. Note that while our base data set contains 13 years of data, one year is lost as we require two years of information to define migration.

taxes on the elite; the y-axis shows whether there is net out-migration from (-) or net in-migration to (+) the other states. If tax flight is occurring, states with higher taxes would show disproportionate flows of millionaires moving to lower tax states. Specifically, the data in Figure 2 should show a downward sloping pattern.

The evidence from Figure 2 is affirmative, but modest. Florida has net in-migration from virtually every other state – shown as negative values on the y-axis. More importantly, migration into Florida is more likely from states that have *higher* tax rates. The greater the tax rate advantage of Florida over another state, the more likely millionaires from that state will migrate to Florida. However, the correlation is low (less than -0.1) and shows considerable noise. Texas (panel 2) also has no state income tax, but has different migration patterns, as it sees both net in-migration from and net out-migration to other states. In-migration tends to come from higher tax states like New York and California, and out-migration tends to go to other low tax states. But much of the relationship is driven by high out-migration from Texas to Florida. New York (panel 3) is a strong contrast to Florida: a high tax state, with net *out*-migration to most states. The negative slope indicates that millionaires leaving New York are more likely to choose a state that has a low tax rate. However, this is due to very high levels of migration to Florida; other states with low tax rates do not disproportionately attract millionaires from New York. The last case study, Illinois (panel 4), has millionaire migration patterns that look very similar to New York: net out-migration to virtually every state, with greater out-migration to lower tax states. The correlation is -0.29, though it is visually clear that the negative relationship between tax advantage and migration flows is driven by Florida as a powerful outlier.

Figure 2. State-to-State Millionaire Migration, by State of Origin, 1999-2011



Source: U.S. Department of the Treasury, IRS microdata, and NBER's TAXSIM program.

The final two panels of Figure 2 pool together the entire migration matrix – the flows between every state pair. In panel 5, using all states, the overall correlation of migration and tax rate difference is -0.24, suggesting a consistently modest relationship. Closer inspection shows that the upper left quadrant is mostly every state's net out-migration to Florida, while the bottom right quadrant mostly reproduces the graph of Florida's net in-migration from these states. This is further illustrated in the final panel 6, excluding the Florida observations, which leaves a flat relationship between taxes and migration, and a correlation of -0.08. Migration to Florida appears to be the core pathway for tax-induced migration.

4.1 Gravity Model of Migration

To formally analyze these data, we use the gravity model of migration (Herting, Grusky, and Rompaey 1997; Conway and Rork 2012; Santos Silva and Tenreyo 2006). The number of millionaire migrants (Mig_{ij}) from state *i* (origin) to state *j* (destination) is a function of the size of the base millionaire populations in each state (Pop_i , Pop_j), the distance between the states ($Distance_{ij}$), and a variable indicating if the states $\{i, j\}$ have a shared border ($Contiguity_{ij}$). These are the core elements that define the basic laws of gravity for interstate migration (e.g., Santos Silva and Tenreyro 2006). To this core model we add the difference in top income tax rates between each state pair ($Tax_Difference_{ij}$). Finally, we specify this as a log-linear model, taking logs of the right-hand side count variables, and estimating with Poisson:

$$Mig_{ij} = \exp(\alpha + \beta_1 \log Pop_i + \beta_2 \log Pop_j + \beta_3 \log Distance_{ij} + \beta_4 Contiguity_{ij} + \beta_5 Tax_Difference_{ij}) + \varepsilon_{ij} \qquad (1)$$

The coefficients from the log-linear model give the semi-elasticity of migration counts with respect to the tax rate – the percent change in migration flows for each percentage point difference in the tax rates.

4.2 Results

Table 2 shows our regression results. Model 1 reports the coefficients from the core gravity variables and the top tax rate difference. The populations of the origin and destination states show nearly-unit elasticities: 1 percent higher millionaire population leads to .94 percent higher migration flows. As the distance between states grows,

migration flows are less frequent, so that a 1 percent increase in distance reduces migration flows by .26 percent. Contiguity has a very strong effect, as states with shared borders have especially high millionaire migration volumes between them.[6] Finally, the top tax rate has a significant impact on millionaire flows, with a semi-elasticity of -0.07. Migration tends to flow from high-tax to low-tax states, and migrations flows are larger when the tax advantage is larger.

Model 2 incorporates a basic set of state-level controls, addressing winter climate, alternative tax instruments (sales and property tax rates), the economic strength of the states, and the price of residential land. These variables have little impact on our coefficient of interest: the effect of the top tax rate is barely changed (-0.08), and is still significant.[7] The main contribution of the controls is to show that millionaires tend to move to states with high residential land prices. This is an important result, as it shows that millionaires are not focused on finding low-cost places to live, but rather are attracted to expensive locations. Millionaires, it seems, are not gentrifiers.

[6] Note that in log-linear models, the coefficients of dummy variables need to be exponentiated for interpretation (Giles 2011). In model 1, contiguity raises migration flows by 113 percent = $100 \times [\exp(0.76) - 1]$.

[7] In alternative specifications, we included a coarse dummy variable for a state-level inheritance tax, and computed effective top tax rates under different assumptions about capital gains income (which mostly affects the federal tax rate). Neither of these affects the results.

Table 2. Log-Linear Regressions for Millionaire Migration

	Model 1 Millionaires	Model 2 Millionaires	Model 3 All Population	Model 4 Millionaires Excl. Florida
Log pop. origin	0.94***	0.96***	0.84***	0.96***
	(0.05)	(0.06)	(0.07)	(0.05)
Log pop. destination	0.95***	0.93***	0.79***	0.81***
	(0.04)	(0.04)	(0.04)	(0.03)
Log distance	-0.26***	-0.26***	-0.26***	-0.25***
	(0.06)	(0.03)	(0.04)	(0.03)
Contiguity	0.76***	0.82***	1.16***	1.09***
	(0.10)	(0.12)	(0.07)	(0.07)
Income tax difference$_{ij}$	-0.07*	-0.08*	0.01	-0.03
	(0.03)	(0.04)	(0.02)	(0.03)
Winter temp / 10		0.09	0.04	0.02
		(0.05)	(0.04)	(0.04)
Sales tax		-0.05	-0.01	-0.03
		(0.03)	(0.02)	(0.03)
Property tax		-0.05	0.03	-0.01
		(0.06)	(0.08)	(0.06)
Unemployment rate		-0.01	-0.01	0.02
		(0.04)	(0.04)	(0.04)
Average income		-0.03*	-0.01	-0.02
		(0.01)	(0.01)	(0.01)
Residential Land Value		0.19**	0.03	0.14**
		(0.07)	(0.05)	(0.05)
Constant	-0.66***	-0.73***	-18.24***	-0.67***
	(0.14)	(0.15)	(1.17)	(0.15)
N (State pairs)	2550	2550	2550	2450
N (Migrations)	139,573	139,573	593,365	98,211
pseudo R-sq	0.754	0.788	0.793	0.805

* p<0.05 ** p<0.01 *** p<0.001. Robust standard errors clustered by state in parentheses. The outcome variables represents counts of millionaire (or all population) migration flows between each state-pair, summed over 1999-2011. Model 3 uses a one percent sample of the total population, rather than just millionaires, and the income tax rate at the median. Model 4 excludes Florida migration flows. Source: Office of Tax Analysis Microdata, 1999-2011.

Model 3 applies the same model to our sample of the total population of tax filers, at all income levels. Are the rich different? For the gravity variables, the estimates for the

whole population are strikingly similar to the millionaire population. The origin and destination populations have similar, though slightly smaller, elasticities. The distance elasticity is the same for millionaires as the general population, and the contiguity effect is somewhat smaller for millionaires. But the most striking difference is that for the general population, there is no significant tax migration effect.[8] Millionaires are more sensitive to income tax rates than are the general population.

4.3 The Florida Effect

Descriptive analysis suggested that evidence for tax migration is largely driven by Florida as an attractive destination for American millionaires. Are elites more able to exploit geographic tax opportunities, or are they just more likely to move to Florida? We test this in model 4, by excluding Florida migration flows from the analysis. Model 4 shows that, outside of Florida, differences in tax rates between states have no effect on elite migration. Other low tax states, such as Texas, Tennessee, or New Hampshire, do not draw away millionaires from the high tax states.

The uniqueness of the Florida effect is a very robust finding. In supplemental models, we test the effect of excluding each state from the analysis one at a time. In essence, this is a Cook's-D examination of influential observations (in this case, sets of observations associated with each state) (Cook 1977; Andersen 2008). When we exclude any other state but Florida, the results are stable and always achieve statistical significance. The main results depend fundamentally on Florida: when Florida is excluded, there is

[8] Note that in model 3, we use the income tax rate at the median income level (roughly $53,000). As a placebo test, we also estimate the model using the tax rates that apply to millionaires, and likewise find a non-significant result.

virtually no tax migration; when any other state is excluded, our core finding of tax-induced migration is supported.

Florida is the leading destination for millionaire migration, and this state is critical to the evidence for tax-induced migration. Florida has no state income tax, but is also attractive in other unique ways – for example, it is the only state with coastal access to the Caribbean Sea. It is difficult to know whether the Florida effect is driven by tax avoidance, unique geography, or some especially appealing combination of the two. Disentangling these factors for one specific state is beyond the scope of this research, but is an important venue for future study.

4.4 Millionaire Heterogeneity

Next, we explore differences in migration responsiveness among distinctive sub-sets of millionaires. We estimate separate regression models for the migration of elites by different economic status, such as business owners and those with super-elite income of $10 million or more. We also run separate models for those of retirement age, those with children at home, and those who are married – looking separately at families with one primary earner, and families with significant dual earnings. Finally, we run models by the persistence of millionaire income – the total number of years that households earn $1 million or more in our 13-year time frame. For each group, Table 3 reports the tax effect coefficient, as well as the group's overall migration rate and the share of the millionaire population they represent. Most of the models in Table 3 show consistent estimates that are close to the Model 2 result of -0.08.

Table 3. Tax-Migration Effects by Socio-Economic Groups

	Tax Migration Coefficient	SE	Overall migration rate	Share of millionaires
All millionaires (Table 2, Model 2)	-0.08*	(0.04)	2.4%	100%
Economic Status				
Business Owner	-0.09*	(0.04)	2.1%	23%
Capital Gains 75%+	-0.07	(0.04)	3.0%	11%
$10M+ annual income	-0.07	(0.04)	2.6%	4%
Retirement Age				
Under Age 65	-0.07*	(0.03)	2.5%	80%
Age 65+	-0.07	(0.06)	2.3%	20%
Family Status				
Children at home	-0.05	(0.03)	2.0%	50%
No children at home	-0.09*	(0.04)	2.9%	50%
Single Filer	-0.05	(0.03)	3.6%	7%
Married, one primary earner	-0.08*	(0.03)	2.5%	81%
Married, dual earners	-0.10*	(0.04)	1.7%	10%
Persistence of Millionaire Income				
One year	-0.02	(0.03)	3.2%	15%
2 to 3 years	-0.05	(0.03)	3.1%	18%
4 to 7 years	-0.08*	(0.03)	2.6%	29%
8 years +	-0.12**	(0.04)	1.9%	38%

* $p<0.05$ ** $p<0.01$. Robust standard errors clustered by state in parentheses. Estimates are income tax rate coefficients from log-linear migration models (Table 2, Model 2 specification), run separately for each socio-economic group. The outcome variables represents counts of millionaire migration flows between each state-pair, summed over 1999-2011. Source: Office of Tax Analysis micro data.

Tax migration is not driven by retirees, nor is it any higher among those earning $10 million. However, one particular set of findings that stands out is the *persistence* of millionaire income over time. "One-time" millionaires show no sensitivity to the top tax rate (-0.02), while households that routinely earn $1 million have the highest tax

responsiveness (-0.12).[9] This suggests that tax avoidance is indeed an element of elite migration: those with a greater lifetime exposure to top tax rates have migration patterns that are more sensitive to these rates. In other words, income tax rates are more salient to those who routinely earn elite incomes.

However, persistent millionaires also have the lowest overall migration *rates*. "One-time" millionaires have an overall migration rate of 3.2 percent, compared to only 1.9 percent among the most persistent millionaires. This supports the hypothesis that elite incomes have a strong place-specific component which ties millionaires to their home states. These results help explain how elite income embeds people in their local regions: those who can expect continuous flows of million-dollar income over time do not tend to move.

Thus, evidence from the persistence of millionaire income gives support to *both* the tax-migration and embeddedness perspectives. On one hand, persistent millionaires are less likely to ever change their state of residence. But when they do move, they are more attentive to top tax rates and are more likely to choose a lower-tax state as their destination. For state tax policy, these two factors would seem to largely cancel each other out. For socio-economic theory, the findings shed new light on the dynamics of elite migration. Those with the strongest incentive to avoid state taxes are also most strongly embedded in their state.

[9] The difference between these two coefficients is statistically significant at the 5 percent level.

4.5 Implied Optimal Tax Rates

Our core estimate is that a one point increase in the tax rate leads to an 8 percent drop in migration flows. However, the practical effect of interest is how this translates into the share of the millionaire population lost to migration. Because migration rates are low, changes in migration flows have a very muted impact on the population. To illustrate, we calculate millionaire population loss for each state on an annualized basis, using the parameter estimates from Table 2, Model 2. For each state, we calculate how many millionaires would be lost if the state raised its tax rate on millionaires by one percentage point (with tax rates constant in all other states).[10] For the average state, a one-point tax increase leads to 12 fewer in-migrations, and 11 additional out-migrations, for a total population loss of 23 millionaire households. Since the average state has an annual millionaire population of over 9,000, this is clearly a small effect size. The millionaire *population elasticity* (η) – defined as the percent change in the population for a percent change in the top tax rate – is 0.1. In other words, a ten percent increase in the top tax rate leads to a one percent loss of millionaire population.

More formally, we incorporate our results into models for the optimal tax rate on top incomes (Kleven et al 2013; Mankiw et al 2009). From the perspective of revenue maximization, the optimal top state tax rate τ^* is driven by three factors: (1) a measure of the portion of total income held by millionaires, a , (2) the elasticity of taxable income, e

[10] The full table of these results is available on request. We estimate these quantities by predicting migration flows for each state using actual tax rates, and then predicting migration flows after increasing the tax rate in one state by one percentage point. We calculate this for each state, one at a time. Of course, if all states increased their tax rates at the same time, this would leave the tax differences unchanged and have no expected impact on migration.

, and (3) the millionaire population elasticity, η. The formula for optimal tax rates on top incomes, taking into account both migration and income effects, is given as follows (Piketty and Saez 2013:429):

$$Optimal\ rate: \quad \tau^* = \frac{1}{1 + a \cdot e + \eta} \qquad (2)$$

Roughly speaking, when the tax rate increases, those with top incomes (reflected in the parameter a) may react negatively by reporting lower earnings (given by e), or by moving to a lower-tax jurisdiction (given by η). We do not estimate a and e, but draw on credible estimates from existing literature ($a = 1.5$, $e = 0.25$) (reviewed in Saez, Slemrod, and Giertz 2012). Inputting these values with our population elasticity estimate ($\eta = 0.1$) into equation 2 gives an optimal tax rate on top incomes of 68 percent.

Table 4 provides a range of optimal tax rate calculations, according to different possible estimates of the migration (and income) elasticity. When there is no tax migration at all ($\eta = 0$) the optimal rate on top incomes is 73 percent. With the level of tax migration we find ($\eta = 0.1$), the rate is five points lower (68 percent). To substantially reduce the optimal rate, there would need to be a population elasticity in the area of $\eta = 1.0$ – roughly ten times greater than our estimate. Even assuming a higher-range estimate for the income elasticity (e = .60), the optimal top tax rate is still 50 percent given our migration findings. At low-range estimates for the income elasticity, the optimal rate is 80 percent. All of these rates are higher than the current combined federal and state top

tax rate in any state.[11] To rationalize current tax rates, the migration response to taxes would need to be 10 to 15 times greater than what we actually observe.

Caution is needed in interpreting these rates. It is difficult to forecast the effect of tax rates that are so much higher than what we currently observe. Such higher rates could become more salient to elites, leading to non-linear increases in migration. Nonetheless, these estimates suggest that in present times, elite migration is not a significant limitation on tax policy for states.

Table 4. Revenue-Maximizing Top Marginal Tax Rates on Income above $1 Million

		Estimate of Population Elasticity (η)				
		$\eta = 0.0$	$\boldsymbol{\eta = 0.1}$	$\eta = 0.2$	$\eta = 0.5$	$\eta = 1.0$
Estimate of Income Elasticity (e)	$e = 0.10$	87%	80%	74%	61%	47%
	$\boldsymbol{e = 0.25}$	73%	**68%**	63%	53%	42%
	$e = 0.60$	53%	50%	48%	42%	34%

Note: estimates calculated using equation 2, at $a = 1.5$. Shown in bold is our millionaire population (migration) estimate of $\eta = 0.1$, and a representative estimate of income elasticity, $e = 0.25$, from the published literature (reviewed in Saez, Slemrod, and Geirtz 2012). We also show the higher-end and lower-end estimates of the income elasticity (0.60 and 0.10, respectively).

Finally, to clarify the implications of our results for understanding elite behavior, we ask how much millionaire migration in America is due to different top tax rates across states. If we eliminated any tax incentive to migrate, by setting all state tax rates to be the same, how much migration among elites would continue to occur? We use the parameter

[11] Note that historically, the top federal tax rate was 70 percent as recently as 1980, and has been as high as 90 percent.

estimates from Model 2 to conduct a counterfactual analysis. At existing state income tax rates, our model predicts 11,250 migrations per year. When we reset the top tax rates to be equal in all states, the model predicts 11,000 migrations – roughly 2.2 percent fewer. Little more than two percent of elite migrations appear to have an income tax motivation.

5. Millionaire Population along the Borders of States

State-to-state millionaire migration flows give positive but limited evidence of tax-migration among top income-earners in the United States. We triangulate on these findings with a sharply-focused discontinuity of millionaire populations along the borders of states. Do millionaires tend to cluster on the low-tax sides of state borders? This is a regression discontinuity design in which "a geographic or administrative boundary splits units into treated and control areas… in an as-if random fashion" (Keele and Titiunik 2014:2). In narrow geographic border regions, there are sharp discontinuities in top tax rates, but few barriers to crossing the border, while the social and economic differences between states are at their minimums. Border regions usually span short commuting distances, allowing continuity of family, social, and business ties (Dahl and Sorenson 2010). A similar quasi-experimental strategy has been used to study the effect of state minimum wage rates on employment (Dube, Lester, and Reich 2010), and of anti-union "right-to-work" laws on both manufacturing employment (Holmes 1998) and the location of Walmart stores (Rao, Yue, and Ingram 2011).

Counties along the border of Washington and Oregon (Figure 3) illustrate the analytic strategy. Oregon has long had one of the most progressive income tax regimes in the U.S., while Washington State has never had a state income tax (Pearson 2014). The

distance between the major cities of these two states (Portland and Seattle) is large: they are roughly 170 miles apart, which imposes potentially significant migration costs, especially in the form of separation from family, friends, colleagues and business partners. However, moving just across the border – from Portland, OR to Vancouver, WA – is a small life change, and is more like changing neighborhoods within a city. Indeed, most points along the border seem readily commutable, substantively similar, and arbitrarily separated by a state border. This is an area in which the costs of migration are smaller and tax flight should be most clearly visible.

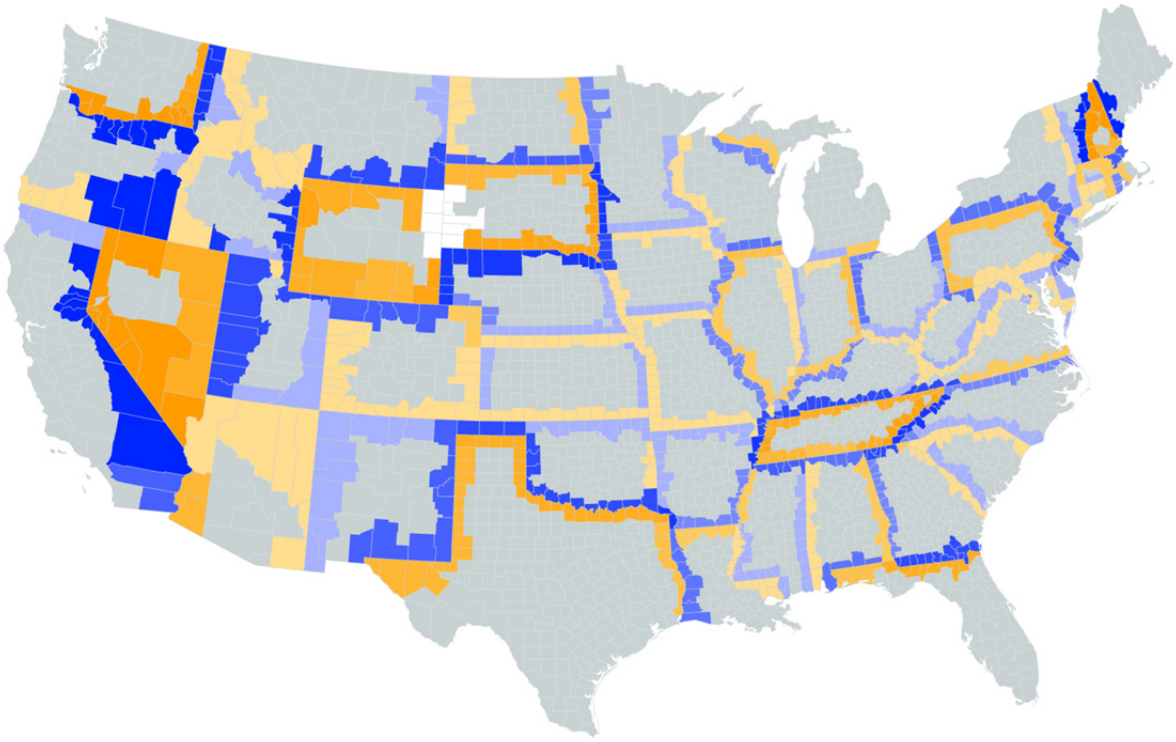
Figure 3. Border Counties of Washington and Oregon



Figure 4 maps all the counties in our border analysis. There are 1,134 counties adjacent to interstate borders, containing 32 percent of the U.S. population and 35 percent of all millionaires in our data set. Blue counties in Figure 4 are on the high-tax side of the state border, and orange counties are on the low-tax side. Darker shading indicates larger

cross-border tax differences. The mean cross-border tax difference is 2.3 percentage points, with the sharpest differences greater than 7 points. Among the largest differences are Oregon–Washington (7.3), Vermont–New Hampshire (6.7), and North Carolina–Tennessee (6.4). Thus, we frequently see large tax differences at state borders.

Figure 4. Border Counties and Tax Differences in the United States



Note: The high-tax side of the border is in blue, while the low-tax side is in orange. Larger tax discontinuities are indicated with brighter coloring.

The border county analysis can be understood as a matching algorithm, matching a treatment county (with higher taxes) to one or more control counties on the opposite side of the state border (Keele and Titiunik 2014). A key question then is the covariate balance between the treatment and control cases (Ho, Imai, King and Stuart 2007). Are the county pairs well-matched and comparable on observables? If the matching algorithm

is successful, border-county pairs will be effectively identical on all explanatory factors except the income tax rate, creating "as if" random assignment to the treatment and control conditions. We consider the covariate balance across county pairs for a broad set of observable characteristics including natural amenities, real estate values, and other state policies (such as sales taxes and "right to work" laws) that may differ at borders. Balance statistics show that the counties are indeed well-matched and largely equivalent on a broad set of non-income-tax characteristics (see Appendix B). Based on observables, the contiguous border county framework appears to provide good quasi-experimental matching of treatment and control cases.

5.1 Spatial Discontinuity Model of Population

Our formal model of millionaire population first considers the basic state-level relationship between millionaire population and top tax rates. The outcome variable is log millionaire population in state *i* in year *t* ($\log M_{it}$), which we expect to vary with a state's overall population ($\log pop_{it}$), and potentially with its effective top tax rate (tax_{it}). We also include year fixed effects (λ_t).

$$\log M_{it} = \alpha + \beta_1 tax_{it} + \beta_2 \log pop_{it} + \lambda_t + \varepsilon_{it} \qquad (3)$$

Next, we move to the matched sample of contiguous county-pairs. All border counties match to at least one cross-border county, and on average they pair with 2.1 cross-border counties. This yields 1,172 county pairs (each with 2 counties). With 16 years in our millionaire population data set, this gives a sample of 37,504 county-years.[12] In this

[12] The data draw for this millionaire county population analysis allows three extra years of data (1996-98), as it does not use the detailed W-2 data that we leveraged in the state-

model, we estimate the effect of the top tax rate on millionaire population *within* county pair-years. We define a unique pair-year term for each county pair in each year (τ_{pt}), and the model is identified solely on the remaining cross-border variation in a given year. In other words, within each county pair, and in a given year, does millionaire population cluster in the county on the low-tax side?

$$\log M_{cpt} = \alpha + \beta_1 tax_{ct} + \beta_2 \log pop_{ct} + \tau_{pt} + \varepsilon_{cpt} \quad (4)$$

Next, we focus on changes in the tax rates over time, within county pairs. For example, if a state raises its top tax rate, while its neighboring states do not, the tax difference at the border increases. We isolate these changes in the tax rates by adding fixed county effects (θ_c) to the model. Within county pairs, what happens when the top tax rate changes in one of the counties?

$$\log M_{cpt} = \alpha + \beta_1 tax_{ct} + \beta_2 \log pop_{ct} + \tau_{pt} + \theta_c + \varepsilon_{cpt} \quad (5)$$

This may be considered to give the short-run or immediate effects of tax changes, while equation 4 gives the long-run effect of established tax differences (Baltagi and Griffen 1984). We estimate these models using OLS, with standard errors clustered by both state and border segment (Dube et al. 2010). Statistical routines that allow for multidimensional clustering of standard errors are not implemented for Poisson regression.[13]

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to-state migration flows analysis (Table 3). The detailed W-2 data are not available for 1996-98.

[13] When we run these models using Poisson, we achieve the same coefficients, but standard errors that are biased by an order of magnitude. Thus, these parameter estimates appear to be robust to the estimator employed.

5.2 Results

Table 5 shows regression results for the millionaire population models. First, we test whether states with higher tax rates have smaller millionaire populations. Beyond the observed migration flows already analyzed, are there simply fewer millionaires in high tax states? Model 5 shows that the effect of the tax rate is indeed negative but small and not statistically significant. The implied elasticity is 0.08, meaning that a 10 percent higher tax rate could lead to a 0.8 percent lower millionaire population. This is similar in magnitude to our findings from the state-to-state migration flows analysis.

Models 6 and 7 make specific cross-border comparisons between contiguous counties. Do higher tax rates reduce millionaire population when we compare sharply-focused regions that seem otherwise equivalent? Model 6 shows supportive evidence of clustering on the low-tax side. Among border county pairs, the county on the high-tax side has a significantly lower millionaire population. The implied elasticity is 0.19, which is still modest but suggests greater tax sensitivity in the border regions than what we see across states overall.

Table 5. Log-Linear OLS Models for Millionaire Population

	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
	States	Border Counties	Border Counties: 40 miles or less	Cross-state MSAs	FE: Border Counties: 40 miles or less	FE: Cross-state MSAs
Log general population	1.095***	1.252***	1.329***	1.330***	0.883***	0.860***
	(0.047)	(0.052)	(0.034)	(0.042)	(0.219)	(0.138)
Tax rate	-0.021	-0.049**	-0.036	-0.045	-0.011	-0.002
	(0.018)	(0.018)	(0.021)	(0.024)	(0.026)	(0.028)
Implied elasticity (η)	0.08	0.19	0.14	0.18	0.04	0.01
Year effects	Yes	No	No	No	No	No
County-pair (or MSA) *x* year effects	No	Yes	Yes	Yes	Yes	Yes
County effects	No	No	No	No	Yes	Yes
N	816	37504	28224	5616	28224	5616
adj. R-sq	0.914	0.891	0.903	0.871	0.380	0.492

Notes: * p<0.05 ** p<0.01 *** p<0.001. Standard errors in parentheses are clustered by state in Models 5, 8, and 10, by state and interstate border in Models 6, 7, and 9. The implied elasticity is the percent change in population for a percent change in the tax rate, evaluated at the mean state tax rate and millionaire population. *Sources*: Office of Tax Analysis micro data, 1996-2011; U.S. Census Bureau, Intercensal Population Estimates, 1996-2011.

However, we note that some of the border counties included in Model 6 are large geographic areas that are not realistic commuting zones and do not form strong test cases. Some border counties are "larger than the state of New Jersey" (Holmes 1998:381) but are home to a scant population. In California, for example, San Bernardino County shares a border with Clark County, Nevada – home to Las Vegas. The population centers of

these two counties are 184 miles apart, and in between them is the Mojave Desert. While these are technically border counties, their large geographic expanse and sparse population near the border make them poor test cases.

In Model 7 we limit the analysis to border counties that span plausible commuting zones, where the population centers of the county pairs are no more than 40 miles apart. This retains 75 percent of the counties, and over 90 percent of the millionaire population, while eliminating county pairs that do not represent small, commutable geographic areas. The results in Model 7 show that in the narrower border regions that motivate this analysis, the tax effect is not statistically significant (with an elasticity of 0.14).

To triangulate and help clarify these results, we also look at metropolitan areas that cross state borders (Coomes and Hoyt 2008). Metropolitan statistical areas (MSAs) are designed to capture distinct labor markets – they are areas of high economic integration based on commuting patterns. There are currently 381 MSAs in the United States, and 50 of these span at least one state border. These cross-state cities provide an alternative way to focus on small, regionally integrated, commutable zones.[14] Model 8 applies the same basic regression model to counties on different sides of a cross-state city. The tax rate coefficient is again negative, but not statistically significant. Within cities that cross state lines, there is limited evidence that millionaires cluster in the part of the city that has lower state income taxes.

[14] This captures a different set of treatment and control counties for two reasons. First, it excludes border counties that are not part of an MSA. Second, it adds counties that, while not exactly contiguous with a state border, are nonetheless part of an integrated border region.

Finally, we revisit the border county and city analyses focusing purely on changes in the top tax rates. For example, in 2004, New Jersey raised its top tax rate, but Delaware, Pennsylvania and New York did not, leading to a change in the tax difference at the border. By incorporating county fixed effects into these models, we isolate changes over time in the tax rates. Over our period of analysis, there were 8 tax policy changes of roughly one percentage point or more (similar to common state millionaire tax proposals), as well as many smaller changes. In the border regions, these policy shifts have not led to observable changes in the millionaire population. In both the commutable border counties (Model 9) and the cross-state cities (Model 10) the results are insignificant and the elasticities are essentially zero. In other words, we see no evidence of short run effects of (modest) tax policy changes. Even in long-run models with larger and long-standing tax differences, the evidence that millionaires choose to live on the low-tax side of state borders is weak.

6. Conclusion: Elite Demography and the Social Consequences of Progressive Taxation

Taxes on elite income earners provide a way to moderate the sharp growth in inequality seen over the last several decades, particularly the rising share of income held by the top one percent (Keister 2014; Piketty 2014; Volscho and Kelly 2012). However, in contemporary policy debates, millionaire migration from higher tax regions is often presented as a key threat to redistributive social and fiscal policies. For this reason, the

mobility of the elite is a salient concern for policy-makers not only in U.S. states, but for governments in many countries (Beckfield 2013; Martin and Prasad 2014).

We presented two core frameworks for understanding elite mobility. In the "transitory millionaires" hypothesis, top earners are residentially mobile and sharply attuned to locational tax advantages. Redistributive policy initiatives are quickly defeated by out-migration of the rich, to the detriment of states with progressive taxation (Feldstein and Wrobel 1998; Slemrod 2010). In contrast, the "embedded elites" perspective emphasizes social and network costs of migration that limit the attractiveness of moving for tax reasons, and that ground millionaires in the regions where they become successful (Dahl and Sorenson 2009; 2012; Ruef, Aldrich and Carter 2003; Saxenian 1994). In this view, progressive taxation is simply part of the regional cost of living for an elite that is not especially concerned with residential affordability.

We draw on big administrative data from restricted IRS tax records, providing a census of top income-earners in America over 1999-2011. While elites are often difficult to interview in conventional surveys, their tax returns document state and county residence over time. This allows multiple and detailed analyses of millionaire migration, using a sample of 45 million observations on millionaires' income and location.

The most striking finding of this research is how little elites seem willing to move to exploit tax advantages across state lines in America. Millionaire tax flight is occurring, but only at the margins of statistical and socio-economic significance. First, millionaires are not very mobile, and actually have lower migration rates than the general population. This is in part because family responsibilities and business ownership are higher among

top income earners, and these serve to embed individuals in their local regions. Nevertheless, there is an observable pattern of elite migration from high-income-tax to low-income-tax states; when millionaires migrate their re-location decisions are influenced by tax rates, in a way that we do not see for the general population. Yet, because migration flows represent a very small share of top income earners, the observed patterns of migration have little impact on the millionaire population tax base even over 13 years. Our core migration estimate translates into a population elasticity of roughly 0.1, meaning that a 10 percent increase in the top tax rate leads to a 1 percent loss of the millionaire population. Incorporating this estimate into optimal tax rate models (Piketty and Saez 2013; Mankiw et al 2009) suggests that the revenue-maximizing top marginal tax rate on income above $1 million is much higher than the current tax rates in any state.

We expand on these results by looking at millionaire population along the borders of states and in cities that cross state borders. Border regions create spatial discontinuities in top tax rates that offer a quasi-experimental identification strategy, and provide an upper-bound estimate (Keele and Titiunik 2014; Rao, Yue, and Ingram 2011). Overall, states with higher tax rates do not have fewer millionaires. But along the borders of states, we do see noticeable differences, consistent with millionaire tax flight within these small geographic zones. However, among the more compelling, easily commutable border regions, the difference in millionaire population at the state border is not significant. Nor is the difference significant within cross-state cities that represent small, commutable, economically integrated zones. Finally, in short-run fixed effects models, there is no population response to changes in the tax difference at the border.

America has increasingly become a "winner-take-all society," where the most successful competitors reap a disproportionate share of economic rewards (Frank and Cook 1995; Hacker and Pierson 2010). The gap between the "winners" and everyone else has grown sharply in recent decades. The challenge of rising inequality is frequently seen as requiring greater coordination and harmonization of progressive tax policies across countries (Genshel and Scwharz 2011; Beckfield 2013). The hallmark of tax policy coordination is the proposed global tax on wealth, as advocated by Piketty (2014). A global tax ameliorates the problem of capital flight by setting a world-wide minimum tax rate on the wealthy, narrowing the window for tax-migration. However, in the United States, political stalemate and growing polarization between red and blue states suggests that greater tax cooperation and harmonization is unlikely. Our findings show that state – and by extension, national – governments have considerable leeway for independent tax policy. States can make policy choices that contribute to the reduction of inequality without waiting for national or international agreements.

The transitory millionaire hypothesis, in its simple form, contains a grain of truth: millionaires pay more attention to tax rates than do the general population. Yet, in its strong forms, the transitory millionaire hypothesis is a misperception of both elites and of the attractiveness of moving to a different state.

First, the hypothesis incorrectly portrays millionaires as frictionless agents that have little or no social ties to place. Under this assumption, the primary constraints on migration are simply the "moving truck" costs, which seem easy for top earners to absorb. However, our results ultimately imply high social and economic costs of migration, even for the

rich. Millionaires do not use their higher income to achieve greater mobility across states, but rather are more grounded in their states. The rich *are* different from the general population. They more often have family responsibilities – spouses and school-age children that embed them in place. They own businesses which tie them to place. And their elite income in itself embeds them in place: millionaires are not searching for economic opportunity – they have found it.

Migration is a discourse of empowerment. Mobility and migration are engrained ideals in American culture, and it fits with intuition that the rich are more geographically mobile than the poor. "To move, to change – that is what enjoys prestige, as against stability, which is often synonymous with inaction" (Boltanski and Chiapello 2005:155; quoted in Costas 2013:1469). The discourse of migration elevates the elite as possessing the mobility that is widely admired. For example, in California, the Senate Republican leader asserted, "There's nothing more portable than a millionaire and his money" (Yamamura 2011). The fact that it is the poor who most "enjoy" this fluidity of place – who most often change their state of residence – should give pause to our understandings of migration. Despite its evocative resonance with ideals of freedom, inter-state migration has been declining for decades (Ferrie 2005; Molloy, Smith, and Wozniak 2011). Today, migration seems to be not a privilege of riches, but rather a burden of dislocation and a loss of social ties – something that high income earners can and do avoid.

Finally, the transitory millionaire hypothesis assumes that the "lifetime income" of top earners is independent of where in the country they live. In this view, income derives simply from an individual's own merits and abilities, and is unrelated to their location or

their proximity to others. The role of social capital and network ties in the production of elite income is often underappreciated, and not well connected to an understanding of elite demography. Most millionaires are the "working rich," and their incomes derive in part from place-based social capital in highly networked industries (Saez 2013; Saxenian 1994; Powell et al 2002; Varner and Young 2012). Low levels of elite migration and limited responsiveness to top tax rates implies that an important portion of income is place-specific and not portable. This leaves us with a future research agenda to better understand the economic embeddedness of the elite, and to study the specific social and economic dynamics that ground millionaires in the places where they achieve success.

Appendix A. Variables, Descriptive Statistics, and Data Sources (1999-2011)

	Mean	Std. Dev.	Min	Max	Source
State-to-State Relational (Matrix) Variables					
Millionaire migrants	53	195	0	3,637	IRS - CDW
All migrants	239	485	0	6,416	IRS - CDW 1% sample
Distance	1,221	912	20	5,112	U.S. Census; Nichols 2003
Contiguity	0.1	0.3	0.0	1.0	Merryman 2005
State Attributes					
Millionaire population	109,966	167,090	5,923	877,643	IRS - CDW
All population	405,595	442,032	33,415	2,407,673	IRS - CDW 1% sample
Income tax rate, $1.7M	38.6	2.1	34.6	41.4	TAXSIM
Income tax rate, $53K	12.1	1.8	9.0	15.5	TAXSIM
Winter temperature	32.3	12.2	2.6	67.4	NOAA Climatic Data
Sales tax rate	4.8	1.9	0.0	7.0	Tax Foundation
Property tax rate	1.0	0.4	0.2	1.8	Tax Foundation
Unemployment Rate	5.6	1.0	3.4	7.6	Bureau of Labor Statistics
Residential Land Value	68,558	89,692	7,518	407,016	Lincoln Institute
Average Income	34,731	5,712	26,553	56,659	Bureau of Economic Analysis

Appendix B. Balance Statistics for the Border County Analysis

To evaluate how well state borders assign counties into treatment (i.e. higher tax rate) and control (i.e. lower tax rate) conditions "as if randomly", we consider whether contiguous border counties match on a broad series of observed characteristics. Each county in the analysis is on either the high tax or the low tax side the border. The table below gives the average value of potential covariates along each side, the average high-low difference within pair-years, and the standard error of this difference.

We first consider other state policies that also change at the border, and we find no differences that covary, in any significant way, with the income tax difference. Low income tax sides have negligibly higher sales and property taxes on average, they are slightly more likely to have an estate or inheritance tax, and they are slightly more likely to have right-to-work laws. However, none of these differences is statistically significant.

To what extent are border counties comparable on non-policy observables? Unemployment rates are effectively identical, which suggests that border counties are in the same labor markets. Per capita income is higher on low tax sides, but this is endogenous to the outcome variable of interest (i.e. millionaire population). Land values are similar, and this finding is consistent with a highly comparable set of natural amenities across the border. There are no differences for winter temperature, winter sunlight, summer temperature, and landscape / topographical variation. Low tax sides do have lower humidity in the summer, and the difference is statistically significant. However, this advantage among low-tax counties is counter-balanced by also having less water area, which makes these counties less attractive. Overall, the USDA's standardized natural amenities scale is 0.23 on low sides and 0.13 on high sides, a 0.1 point difference

that is smaller than its standard error. Finally, percent urban population and population density are statistically indistinguishable at the border. Overall, the high degree of balance across observable characteristics gives reassurance that the contiguous border county framework provides strong quasi-experimental matching of treatment and control cases.

Table B1. Balance Comparison Within Border County Pairs

	Income tax			
	High	Low		
Characteristic	side	side	Difference	(s.e.)
Sales tax rate	4.98	5.06	-0.08	(0.33)
Property tax rate	0.90	1.00	-0.10	(0.10)
Estate or inheritance tax indicator	0.39	0.46	-0.07	(0.12)
Right-to-work law indicator	0.49	0.56	-0.07	(0.10)
Unemployment rate	6.02	6.01	0.01	(0.16)
Average income ($000s)	31.20	32.82	-1.62	(0.77)*
Residential land value ($000s/lot)	36.81	37.86	-1.05	(8.52)
Total land value ($000s/acre)	20.67	17.58	3.09	(5.06)
Developed land value ($000s/acre)	77.99	77.30	0.69	(14.26)
Aggregate natural amenities scale	0.13	0.23	-0.10	(0.13)
January temperature (F)	31.64	31.67	-0.03	(0.18)
July temperature (F)	75.41	75.51	-0.10	(0.18)
January sunlight (hours)	150.20	152.03	-1.83	(2.37)
July humidity (%)	55.50	54.22	1.29	(0.63)*
Topographical variation	9.97	10.15	-0.18	(0.35)
Water area (%)	3.27	2.78	0.50	(0.38)
Urban population (%)	39.31	41.20	-1.88	(2.15)
Population per square mile	278.41	235.78	42.64	(56.86)

* $p<0.05$ ** $p<0.01$ *** $p<0.001$ Because counties within the same state share similar tax rates and because counties can be paired to more than one county along the same state-to-state border, standard errors are clustered by state and border. Counties along the South Dakota-Wyoming border, where there is no income tax difference, are not included in this table (N=37280).

References

Alm, James and Sally Wallace. 2000. "Are the Rich Different?" Pages 165-92 in Slemrod, Joel (ed), *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*. New York: Russell Sage Foundation.

Andersen, Robert. 2008. *Modern Methods for Robust Regression*. Thousand Oaks, CA: Sage Publications.

Baldwin, Richard, and Paul Krugman, 2004. "Agglomeration, Integration, and Tax Harmonisation." *European Economic Review* 48, 1–23.

Baltagi, Badi and James Griffin. 1984. "Short and Long Run Effects in Pooled Models." *International Economic Review*. Vol. 25(3):631-645.

Beckfield, Jason. 2013. "The End of Equality in Europe?" *Current History*. March 2013:94-99.

Brady, David, Jason Beckfield, Martin Seeleib-Kaiser. 2005. "Economic Globalization and the Welfare State in Affluent Democracies, 1975–2001." *American Sociological Review*. Vol. 70(6):921-948.

Brady, David, Jason Beckfield, and Wei Zhao. 2007. "The Consequences of Economic Globalization for Affluent Democracies." *Annual Review of Sociology*. Vol. 33:313-334

Carruthers, Bruce, and Naomi Lamoreaux. 2012. "Regulatory Races: The Effects of Jurisdictional Competition on Regulatory Standards." Working Paper.

Cohen Roger, Lai Andrew, and Charles Steindel. 2015. "A Replication of 'Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment.'" *Public Finance Review*. Vol. 43(2): 206-225.

Conway, Karen, and Jonathan Rork. 2012. "No Country For Old Men (or Women) – Do State Tax Policies Drive Away the Elderly?" *National Tax Journal*. Vol. 65(2): 313-56.

Cook, Dennis. 1977. "Detection of Influential Observations in Linear Regression." *Technometrics*. Vol. 19 (1): 15–18.

Costas, Jana. 2013. "Problematizing Mobility: A Metaphor of Stickiness, Non-Places and the Kinetic Elite." *Organization Studies*. vol. 34(10): 1467-85.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *Quarterly Journal of Economics*. Vol. 129(4): 1553-1623.

Davis, Morris and Jonathan Heathcote. 2007. "The Price and Quantity of Residential Land in the United States." *Journal of Monetary Economics*. Vol. 54(8): 2595-620.

Diamond, Peter, and Emmanuel Saez. 2011. "The Case for a Progressive Income Tax: From Basic Research to Policy Recommendations." *Journal of Economic Perspectives*. Vol. 25(4): 165-90.

Dobbin, Frank, Beth Simmons, and Geoffrey Garrett. 2007. "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning?" *Annual Review of Sociology*. Vol. 33: 449-472.

Dahl, Michael, and Olav Sorenson. 2009. "The Embedded Entrepreneur." *European Management Review*. Vol. 6:172-81.

Dahl, Michael, and Olav Sorenson. 2010. "The Social Attachment to Place." *Social Forces* 89(2): 633–658.

Dahl, Michael, and Olav Sorenson. 2012. "Home Sweet Home: Entrepreneurs' Location Choices and the Performance of their Ventures." *Management Science*. Vol. 58:1059-71.

Dube, Arindrajit, T. William Lester, and Michael Reich. 2010. "Minimum Wage Effects Across State Borders: Estimates Using Contiguous Counties." *Review of Economics and Statistics*. Vol. 92(4): 945-964.

Einav, Liran, Dan Knoepfle, Jonathan Levin, and Neel Sundaresan. 2014. "Sales Taxes and Internet Commerce." *American Economic Review*. Vol. 104(1): 1–26.

Erb, Kelly. 2013. "Depardieu Accepts Offer Of Russian Citizenship To Escape Higher Taxes." *Forbes Magazine*. January 4.

Esping-Andersen, Gosta. 1990. *The Three Worlds of Welfare Capitalism*. Princeton: Princeton University Press.

Fairfield, Tasha. 2013. "Going Where the Money is: Strategies for Taxing Economic Elites in Unequal Democracies." *World Development*. Vol. 47:42–57.

Feenberg, Daniel, and Elizabeth Coutts. 1993. "An Introduction to the TAXSIM Model." *Journal of Policy Analysis and Management.* Vol. 12: 189–94.

Feldstein, Martin, and Marian Wrobel, 1998. "Can State Taxes Redistribute Income?" *Journal of Public Economics.* Vol. 68: 369–396.

Ferrie, Joseph. 2005. "The End of American Exceptionalism? Mobility in the United States Since 1850." *Journal of Economic Perspectives*. Vol. 19(3):199-215.

Fligstein, Neil, and Iona Mara-Drita. 1996. "How to Make a Market: Reflections on the European Union's Single Market Program." *American Journal of Sociology*. Vol. 102: 1-33.

Frank, Robert, and Phillip Cook. 1995. *The Winner-Take-All Society: how more and more Americans compete for ever fewer and bigger prizes, encouraging economic waste, income inequality, and an impoverished cultural life*. New York: Free Press.

Garber, Andrew. 2010. "Boeing and Microsoft Oppose the Income-Tax Measure I-1098." *The Seattle Times*. Oct. 6.

Geist, Claudia and Patricia A. McManus. 2008. "Geographical Mobility over the Life Course: Motivations and Implications." *Population, Space and Place*. Vol. 14:283-303.

Goolsbee, Austan, Michael Lovenheim and Joel Slemrod. 2010. "Playing With Fire: Cigarettes, Taxes, and Competition from the Internet." *American Economic Journal: Economic Policy*. Vol. 2(1):131-154.

Gross, Emily, 2003. "U.S. Population Migration Data: Strengths and Limitations." Internal Revenue Service Statistics of Income Division, Washington, DC. http://www.irs.gov/pub/irs-soi/99gross_update.doc.

Hacker, Jacob and Paul Pierson. 2010. *Winner-Take-All Politics: How Washington Made the Rich Richer-and Turned Its Back on the Middle Class*. New York: Simon & Schuster.

Hernández-Murillo, Rubén, Leslie Ott, Michael Owyang, and Denise Whalen. 2011. "Patterns of Interstate Migration in the United States from the Survey of Income and Program Participation." *Federal Reserve Bank of St. Louis Review*. Vol. 93(3):169-85.

Herting, Jerald, David Grusky and Stephen Van Rompaey. 1997. "The Social Geography of Interstate Mobility and Persistence." *American Sociological Review*. Vol. 62(2):267-287.

Hicks, Alexander and Lane Kenworthy. 2003. "Varieties of Welfare Capitalism." *Socio-Economic Review*. Vol. 1: 27-61.

Hirschman, Albert. 1970. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.

Ho, Daniel, Kosuke Imai, Gary King, and Elizabeth Stuart. 2007. "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference." *Political Analysis*. Vol. 15:199-236.

Holmes, Thomas J. 1998. "The Effect of State Policies on the Location of Manufacturing: Evidence from State Borders." *Journal of Political Economy*. Vol. 106(4): 667-705.

Hunter, Rosalind, Andrew Oswald and Bruce Charlton. 2009. "The Elite Brain Drain." *Economic Journal*. Vol. 119(538): F231-51.

Kaplan, Greg and Schulhofer-Wohl. 2012. "Interstate Migration Has Fallen Less than You Think: Consequences of Hot Deck Imputation in the Current Population Survey." *Demography*. 49(3), 1061-74.

Keele, Luke, and Rocio Titiunik. 2014. "Geographic Boundaries as Regression Discontinuities." *Political Analysis*. Advance access. Oct 30, 2014.

Keister, Lisa. 2014. "The One Percent." *Annual Review of Sociology.* Vol. 40:347-67.

Kenworthy, Lane. 2014. *Social Democratic America*. Oxford: Oxford University Press.

Khan, Shamus Rahman. 2012. "The Sociology of Elites." *Annual Review of Sociology.* Vol. 38:361–77.

Kleven, Henrik, Camille Landais and Emmanuel Saez. 2013. "Taxation and International Migration of Superstars: Evidence from the European Football Market". *American Economic Review*. Vol. 103(5): 1892-1924.

Kleven, Henrik, Camille Landais, Emmanuel Saez, and Esben Schultz. 2014. "Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners' Tax Scheme in Denmark." *Quarterly Journal of Economics*. Vol. 129: 333-378.

Knight, Phil. 2010. “Nike chairman: Anti-business climate nurtures 66, 67.” *The Oregonian*. January 17.

Marian, Omri. 2015. “Home-Country Effects of Corporate Inversions.” *Washington Law Review*. Volume 90 (forthcoming).

Marples, Donald and Jane Gravelle. 2014. “Corporate Expatriation, Inversions, and Mergers: Tax Issues.” Congressional Research Service. 7-5700.

Martin, Isaac. 2008. *The Permanent Tax Revolt: How the Property Tax Transformed American Politics*. Palo Alto, Calif.: Stanford University Press.

Martin, Isaac. 2010. “Redistributing toward the Rich: Strategic Policy Crafting in the Campaign to Repeal the Sixteenth Amendment, 1938–1958.” *American Journal of Sociology*. Vol. 116(1): 1-52.

Martin, Isaac. 2013. *Rich People’s Movements: Grassroots Campaigns to Untax the One Percent*. Cambridge: Cambridge University Press.

Martin, Isaac and Monica Prasad. 2014. “Taxes and Fiscal Sociology.” *Annual Review of Sociology* 40(1): 331-345.

McCall, Leslie, and Christine Percheski. 2010. “Income Inequality: New Trends and Research Directions.” *Annual Review of Sociology*. Vol. 36: 329 -347.

McCall, Leslie. 2012. *The Undeserving Rich: American Beliefs about Inequality, Opportunity, and Redistribution*. Cambridge: Cambridge University Press.

McGranahan, David A. 1999. “Natural Amenities Drive Rural Population Change.” *Agricultural Economic Report* 781.

Merriman, David. 2010. “The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago.” *American Economic Journal: Economic Policy*. Vol. 2(2): 61-84.

Michelacci, Claudio and Olmo Silva. 2007. “Why So Many Local Entrepreneurs?” *Review of Economics and Statistics*. Vol. 89(4): 615–633.

Mirrlees, James. 1982. “Migration and Optimal Income Taxes.” *Journal of Public Economics.* Vol. 18(3): 319–341.

Molloy, Raven, Christopher L. Smith, and Abigail Wozniak. 2011. “Internal Migration in the United States.” *Journal of Economic Perspectives* 25(3):173-96.

Morgan, Kimberly, and Monica Prasad. 2009. "The Origins of Tax Systems: A French-American Comparison." *American Journal of Sociology*. Vol. 114(5):1350-1394.

Newman, Katherine, and Rourke O'Brien. 2011. *Taxing the Poor: Doing Damage to the Truly Disadvantaged*. University of California Press.

Office of the Governor. 2010. "Remarks of Governor Chris Christie to the Joint Session of the New Jersey Senate and General Assembly Regarding the Fiscal Year 2011 Budget," March 16, 2010. Retrieved July 26, 2014, from http://www.state.nj.us/governor/news/addresses/2010s/approved/20100316.html.

Olson, Gary, and Judith Olson. 2000. "Distance Matters." *Human Computer Interaction*. Vol. 15: 139-78.

Page, Benjamin, Larry Bartels, and Jason Seawright. 2013. "Democracy and the Policy Preferences of Wealthy Americans." *Perspectives on Politics* 11(1):51–73.

Pearson, Elizabeth. 2014. "Saying Yes to Taxes: The Politics of Tax Reform Campaigns in Three Northwestern States, 1965–1973." *American Journal of Sociology*. Vol. 119(5):1279-1323.

Piketty, Thomas, and Emmanuel Saez. 2003. "Income Inequality in the United States, 1913-1998". *Quarterly Journal of Economics*. Vol. 118(1): 1-39.

Piketty, Thomas, and Emmanuel Saez. 2007. "How Progressive is the U.S. Federal Tax System? A Historical and International Perspective." *Journal of Economic Perspectives*. Vol. 21(1): 3-24.

Piketty, Thomas, and Emmanuel Saez. 2013. "Optimal Labor Income Taxation." Pages 391-474 in Auerbach, Alan, Raj Chetty, Martin Feldstein and Emmanuel Saez (eds). *Handbook of Public Economics*. Volume 5.

Piketty, Thomas. 2014. *Capital in the Twenty-First Century*. Cambridge: Harvard University Press.

Powell, Walter W., Kenneth W. Koput, James I. Bowie, and Laurel Smith-Doerr. 2002. "The Spatial Clustering of Science and Capital: Accounting for Biotech Firm-Venture Capital Relationships." *Regional Studies* 36(3) 291-305.

Prasad, Monica. 2014. *The Land of Too Much: American Abundance and the Paradox of Poverty*. Cambridge: Harvard University Press.

Rao , Hayagreeva, Lori Qingyuan Yue, and Paul Ingram. 2011. "Laws of Attraction: Regulatory Arbitrage in the Face of Activism in Right-to-Work States." *American Sociological Review*. Vol. 76(3):365-85.

Rapino, Melanie, and Alison Fields. 2013. "Mega Commuting in the U.S.: Time and Distance in Defining Long Commutes using the 2006-2010 American Community Survey." United States Census Bureau. Working Paper 2013-03.

Ruef, Martin, Howard Aldrich and Nancy Carter. 2003. "The Structure of Founding Teams: Homophily, Strong Ties, and Isolation among U.S. Entrepreneurs." *American Sociological Review*. Vol. 68(2): 195-222.

U.S. Census Bureau, 2010. "Centers of Population by State: 2010", https://www.census.gov/geo/reference/docs/cenpop2010/CenPop2010_Mean_ST.txt;

Nichols, Austin. 2003. "VINCENTY: Stata module to calculate distances on the Earth's surface," Statistical Software Components S456815, Boston College, revised 16 Feb 2007.

Merryman, Scott. 2005. "USSWM: Stata module to provide US state and county spatial weight (contiguity) matrices." Statistical Software Components S448405, Boston College, revised 27 Aug 2008.

Saez, Emmanuel. 2015. "Striking it Richer: The Evolution of Top Incomes in the United States. (Updated with 2013 preliminary estimates)." Originally published in *Pathways Magazine*, Stanford Center for the Study of Poverty and Inequality. Winter 2008, 6-7.

Saez, Emmanuel, Joel Slemrod, and Seth Giertz. 2012. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." *Journal of Economic Literature*. Vol. 50(1): 3-50.

Sanandaji, Tino. 2013. "The International Mobility of Billionaires." *Small Business Economics*. Vol. 42:329-38.

Santos Silva, J, and Silvana Tenreyro. 2006. "The Log of Gravity." *Review of Economics and Statistics*. Vol. 88(4):641-58.

Saxenian, AnnaLee. 1994. *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Cambridge: Harvard University Press.

Schwartz, Christine. 2013. “Trends and Variation in Assortative Mating: Causes and Consequences.” *Annual Review of Sociology* 39:451-70.

Simula, Laurent and Alain Trannoy, 2011. “Shall we Keep the Highly Skilled at Home? The Optimal Income Tax Perspective," CESifo Working Paper Series 3326, CESifo Group Munich.

Slemrod, Joel. 2010. “Location, (Real) Location, and Tax (Location): An Essay on the Place of Mobility in Optimal Taxation.” *National Tax Journal*. Vol. 63(4):843-864.

Sorenson, Olav, and Pino Audia. 2000. “The Social Structure of Entrepreneurial Activity: Geographic Concentration of Footwear Production in the US, 1940-1989.” *American Journal of Sociology*. Vol. 106: 424-461.

Starr, Paul. 2015. “How Gilded Ages End.” *The American Prospect*. Retrieved Dec. 20, 2015 (http://prospect.org/article/how-gilded-ages-end).

Varner, Charles, and Cristobal Young. 2012. “Millionaire Migration in California: The Impact of Top Tax Rates.” Working Paper. Stanford University Center on Poverty and Inequality.

Volscho, Thomas, and Nathan Kelly. 2012. “The Rise of the Super-Rich: Power Resources, Taxes, Financial Markets, and the Dynamics of the Top 1 Percent, 1949 to 2008.” *American Sociological Review*. Vol. 77: 679-699

Wozniak, Abigail. 2010. “Are College Graduates More Responsive to Distant Labor Market Opportunities?” *Journal of Human Resources*. Vol. 45(4): 944-970.

Yamamura, Kevin. 2011. “Plans to ‘tax the rich’ hold risks and rewards for California”. *Sacramento Bee*. December 27, 2011. Retrieved July 26, 2014, from http://www.mcclatchydc.com/2011/12/27/134149/plans-to-tax-the-rich-hold-risks.html.

Young, Cristobal, and Chaeyoon Lim. 2014. “Time as a Network Good: Evidence from Unemployment and the Standard Work Week.” *Sociological Science*. Vol. 1:10-27.

Young, Cristobal, and Charles Varner. 2011. “Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment.” *National Tax Journal.* Vol. 64(2): 255–84.

Young, Cristobal and Charles Varner. 2015. “A Reply to ‘A Replication of "Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment".” 2015. *Public Finance Review*. Vol. 43(2) 226-234.

Zucker, Lynne, and Michael Darby, 2007. “Star Scientists, Innovation and Regional and National Immigration.” NBER Working Paper 13547. National Bureau of Economic Research.

Chapter 5. Elite Embeddedness: Implications for Inequality

Contrary to the conventional wisdom in both academic and policy circles, progressive taxation at the state level is possible, even with open borders between states. The results of these three substantive chapters on millionaire migration show that the responsiveness of elite migrants to state tax changes and to long-run differences in state tax rates is low. Economic elites are a hard-to-reach population, and as such, they are difficult to study using traditional survey methods. Even when millionaires do appear in surveys, the analyst can rarely distinguish them from non-millionaires due to the top-coding of income. And of course, there are significant and well-established challenges with survey methods, including selection bias and self-reporting. The present study overcomes these problems by utilizing a new source of data on millionaires: state and federal tax records, which collectively cover the entire population of millionaires in the United States.

Summary of Key Findings

This dissertation sets forth a precise and rigorous method for the analysis of tax migration using administrative data. Chapter 2 presents the socio-economic theory of tax migration and the empirical intuition for identifying tax migration. It shows that two recent tax changes in California had no measureable impact on elite migration. In fact, millionaire migration *into* California increased after the state added a tax on millionaires in 2005. Chapter 2 does find a migration effect for a known migration cause, divorce, which demonstrates that the administrative data, in combination with our methods, can

detect migration induced by non-tax causes. The panel nature of the California data also reveals the transitory nature of many million-dollar incomes. Millionaires who earn $1 million in a given year (and thus become subject to the tax) are frequently having an unusually good year. The lack of migration response suggests that millionaires are reluctant to move at a high point in their income trajectory.

Chapter 3 develops difference-in-differences regression models for the analysis of a relatively large tax change in New Jersey. The core model compares the before-after change in millionaire migration rates to the before-after change in the migration rates of a control group of top earners just below the new tax bracket. In Model 3, we show that New Jersey millionaires did not have a statistically significant response to a 2.6 percentage point increase in their marginal tax rate. However, we do observe some responsiveness within subsets of the millionaire population. Millionaires who are less embedded in the state (i.e., retirees and those who earn all of their income from investments) as well as those who earn at least $3 million annually (the top 0.1 percent) do seem more sensitive to the tax.

Nevertheless, the total number of millionaires "lost" due to the tax change is small—roughly 70 millionaires over a four-year period. This should be considered in relation to roughly $4 billion in new revenues generated by the tax over the same period. The fact that migration responsiveness was not statistically significant among business owners indicates that embeddedness diminishes elite migration responsiveness to tax changes. The New Jersey analysis is a most-likely research design given the close proximity of lower-tax states (i.e., Connecticut, New York State, Pennsylvania) to the primary areas of elite economic activity around New York City and Philadelphia. If we

were going to observe significant tax migration, New Jersey is one place we would most expect to see it happen…but it didn't.

Finally, Chapter 4 applies a full log-linear gravity model of migration to the entire U.S. millionaire population, drawing on 13 years of tax records for every millionaire in the country. We also include a sharp regression discontinuity design that analyzes the effect of differential tax rates on the millionaire population along state borders from 1996 to 2011. This analysis is different from the California and New Jersey analyses because it considers the migration effect of long-term tax differences between states.[1] We do find evidence that millionaires move to lower-tax states. However, this effect is driven entirely by flows to Florida, a state that offers many other non-tax amenities. Without Florida in the analysis, the long-run tax migration effect is not statistically significant.

Like the New Jersey analysis, the state border analysis is a "most-likely" research design. If millionaires were sensitive to long-run differences in tax rates, we would expect to observe millionaires clustering in counties on the low-tax side of state borders. This is a strong test of tax migration theory because, but for the tax difference, millionaires should be otherwise indifferent between states in the narrow border region of two adjacent counties that happen to fall on opposite sides of the border. These regions are otherwise indistinguishable across a broad set of covariates. In some cases, border counties are two parts of the same multi-state city (e.g., Memphis, Tennessee / West Memphis, Arkansas / Desoto County, Mississippi). If millionaires can live in the same city—yet pay lower income taxes in one part of that city—we would expect to see a

[1] In the state border analysis, we also consider all state changes in tax policy, and find no effect.

residential concentration of elites in the lower-tax state. However, we find no evidence of such clustering.

The results of these analyses are consistently clear. The migration effects of more progressive income taxes at the state level have been, at most, very small (Young and Varner 2015). This is because, with respect to residential mobility decisions, elites are not actually very different from the general population. They are embedded in local communities through their economic and social ties, and they also tend to have demographic characteristics that make them even more embedded than the general population. Millionaires are more likely to be married, to have children, and to own a business, all of which strongly connect them to their local community. Elite embeddedness has likely increased with rising marital endogamy (Rosenfeld 2008; Schwartz and Mare 2005). Elites are more likely to be in dual-earner couples, and this further reduces their ability to move in order to avoid higher taxes.

Put another way, we find no evidence that state tax progressivity causes significant tax flight by elites. This finding is a sharp rebuke to the classic economic and political argument that millionaires will simply leave a state once the tax burden rises. To the contrary, for many millionaires, economic and social ties to a given location outweigh the financial advantage of moving to a state with lower taxes on the rich. Place-based social ties are imbued with both capital and status, and thus the risks incurred in a cross-state move are significant. Millionaires, moreover, have high-status positions as members of a state's elite, and such positions are apparently not easily rebuilt in some other (lower-tax) place.

Implications for Inequality

These results imply that state-level tax progressivity is not a temporary disequilibrium that is bound to fade away over time. Rather, there is room for states (and countries with open borders, as in the European Union) to make their own tax policy without driving elites out of the state (or country). As a policy matter, this means that states can respond to demands for a more equal income distribution. Indeed, the recent flattening of the federal tax system would seem to contradict evidence that Americans prefer a more progressive tax system. Contrary to the popular notion, Americans do not have higher average tolerance for inequality, and they are becoming increasingly less tolerant of gaps between top incomes and the rest (Osberg and Smeeding 2006). Majorities also support raising taxes to pay for specific equality-enhancing programs (Page and Jacobs 2009).

In short, Americans seem to tolerate about as much inequality as their old world counterparts do, and it seems unlikely that they have become more carefree about inequality during its recent rise. A February 2012 poll showed that 3 out of every 4 Americans support raising taxes on millionaires (Young and Varner 2013). Although public support for tax progressivity in general—as opposed to millionaire taxes tailored specifically to top incomes—is more mixed (McCall and Kenworthy 2009; McCall 2013), it seems clear that sharp reductions in federal tax rates cannot be explained by a uniquely American unwillingness to redistribute.

The causes of the U-turn in American tax progressivity are no doubt complex. One stark possibility is that our democracy is simply broken, and that Americans are not getting the policies they want. The median voter theorem predicts that rising inequality

will increase redistribution (Meltzer and Richard 1981; Kenworthy and Pontusson 2005). However, this theorem assumes that the "voice" of the poor and the middle classes are heard more loudly than the voice of the rich. The research on policy responsiveness shows that this is a faulty assumption. Across many different policies, the poor and the middle class get their preferred outcomes much less frequently than the affluent do (Gilens 2005).

Is less tax progressivity the result of the disproportionate political influence of the affluent? A yes answer to this question seems insufficient, since it would not explain how or why elites withdrew their historical acceptance of the progressive income tax (Khan 2012). Nor is it even clear that elites have withdrawn their support. In the survey referenced above, 89 percent of Democrats supported the millionaire tax, and majorities of Republicans, Tea Party supporters, and 67 percent of millionaires supported it too.

Yet regardless of actual levels of support for redistribution among the public and among the elite, there has been significant downward pressure on income tax rates over the last thirty-five years. This pressure has frequently been cast in terms of losses that taxes impose on total social welfare. While the supposed threat that progressive taxation and more equality poses to economic growth has been called into question by top economists (Berg and Ostry 2011; Stiglitz 2012), the notion that economic elites will move themselves or their businesses in order to arbitrage jurisdictional tax differences has gone largely unquestioned. The evidence presented here suggests that the threat of tax migration should not impose a race to the bottom in state tax rates. Even if political polarization prevents optimal tax rates at the federal level, the evidence on millionaire migration implies that state policy-makers are free to follow the preferences of their own

constituencies. The range of possible within-country variation in the welfare state remains to be seen. However, some U.S. states have clearly been able to follow less "residual" paths.

There is room for redistributive reform at the state level, and fear of elite "exit" should not deter state policy-makers. Accordingly, future research should focus on other factors that promote or limit redistribution. We know now that tax progressivity is possible at the state level, and this finding opens up a broad research agenda to understand why states vary in tax progressivity and redistributive effort. Tax rate variation between states can no longer be understood as a set of temporary experiments in progressivity. Rather, we should endeavor to define the social and political processes that bring about more or less redistributive structures. The existing literature has either taken a public finance perspective on variations in state-level progressivity or applied social spending models (Chernick 2005; Jacobs and Helms 2001; Jacobs and Waldman 1983). As a result, one compelling area for future research is on the role of elite "voice" in the determination of state tax rates (Hirschman 1970).

This research can proceed on four fronts. First, we know that elites are not very exit-responsive to state tax progressivity, yet we know less about which factors do cause elite mobility. With further specification of the actual determinants of elite mobility, future research will be able to triangulate on whether elites do use "exit as voice" – that is, whether political opposition to progressive taxation plays a role in the elite migration that we do observe. Second, we should better understand the differences between elites and the general population in political support for progressive taxation, and how this varies by state. Third, research should proceed on other "voice" strategies that are used

in opposition to progressive taxation at the state level. Threats of elite exit certainly appeared in recent millionaire tax rejections in Washington State and North Carolina, but other components of such opposition would also be fruitful avenues for research. Finally, further study is required on other factors that allow for more or less redistribution at the state level, specifically on the tax side of the equation. To date, the study of variation in the American welfare state has been hamstrung by a lack of available data on state tax structures. Yet, the distributive character of the American welfare state is, with the expansion of both federal and state earned income tax credits, increasingly determined by the tax code. Accordingly, improved understanding of the state and regional variation in welfare state redistribution must begin with a careful assessment of state tax data.[2]

Conclusion

To paraphrase Charles Tilly (1998), inequality exists because some control the success chances of others; inequality persists because these relations become embedded, perhaps even accepted, features of social life. Tilly's framework highlights a central theoretical tension in sociology between the institutional and attitudinal foundations of regime legitimacy. In theory, democracy allows voters to decide how much inequality ought to be tolerated. In practice, numerous factors intervene between voters' expressed willingness to redistribute and the amount of redistribution that ultimately occurs. The results here effectively rule out one such factor. Tax migration is not a real constraint on redistribution; rather, states have significant leeway to mitigate inequality.

[2] This assessment can draw on the new panel data set I have constructed showing actual tax progressivity over time in 21 states. This data set provides the effective state income tax rates by income level accounting for all deductions and credits.

Explanations for inequality have tended to privilege "market" forces, like the lower tax price of another state. It falls to sociologists to demonstrate that market outcomes are not inevitable. Economist Joseph Pechman wrote: "The distribution of tax burdens by income class is of major concern to the general public, political leaders, and social scientists, yet the information regarding this distribution is scanty" (1985:vii). In recent years, however, the use of administrative data on federal income tax burdens has produced surprising findings on the additional extent of income inequality at the very top of the income distribution (Piketty and Saez 2007). While federal tax progressivity has been declining, some states have responded to rising inequality with more progressive tax rates. Under the existing theory, millionaire migration should have made the millionaire tax an unsuccessful experiment in state fiscal policy. The evidence in this dissertation shows otherwise. As McCall and Percheski argued in 2010, sociologists should be developing more sources of administrative data for the study of inequality. This has been, and is, the mission.

References

Berg, Andrew G., and Jonathan D. Ostry. 2011. "Inequality and Unsustainable Growth: Two Sides of the Same Coin?" IMF Staff Discussion Note, April 8.

Chernick, Howard. 2005. "On the Determinants of Subnational Tax Progressivity in the US." *National Tax Journal* 58:93-112.

Gilens, Martin. 2005. "Inequality and Democratic Responsiveness." *Public Opinion Quarterly* 69:778-96.

Hirschman, Albert. 1970. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.

Jacobs, David, and Ronald Helms. 2001. "Racial Politics and Redistribution: Isolating the Contingent Influence of Civil Rights, Riots, and Crime on Tax Progressivity." *Social Forces* 80:91-121.

Jacobs, David and Don Waldman.1983. "Toward a Fiscal Sociology: Determinants of Tax Regressivity in the American States." *Social Science Quarterly* 64:550-65.

Kenworthy, Lane, and Jonas Pontusson. 2005. "Rising Inequality and the Politics of Redistribution in Affluent Countries. *Perspectives on Politics* 3(3):449–471.

Khan, Shamus. 2012. "The Rich Haven't Always Hated Taxes." Time. http://ideas.time.com/2012/09/18/the-rich-havent-always-hated-taxes/.

McCall, Leslie. 2013. *The Undeserving Rich: American Beliefs about Inequality, Opportunity, and Redistribution*. Cambridge University Press.

McCall, Leslie, and Christine Percheski. 2010. "Income Inequality: New Trends and Research Directions." *Annual Review of Sociology* 36:329-47.

McCall, Leslie, and Lane Kenworthy. 2009. "Americans' Social Policy Preferences in the Era of Rising Inequality." *Perspectives on Politics* 7(3):459-484.

Meltzer, Allan H., and Scott F. Richard. 1981. "A Rational Theory of the Size of Government." *The Journal of Political Economy* 89:914-927.

Osberg, Lars, and Timothy Smeeding. 2006. "'Fair' Inequality? Attitudes Toward Pay Differentials: The United States in Comparative Perspective." *American Sociological Review* 71:450-73.

Page, Benjamin I. and Lawrence R. Jacobs. 2009. *Class War?: What Americans really Think about Economic Inequality.* Chicago: University Of Chicago Press.

Rosenfeld, Michael J. 2008. "Racial, Educational and Religious Endogamy in the United States: A Comparative Historical Perspective." *Social Forces* 87(1):1-31.

Schwartz, Christine R., and Robert D. Mare. 2005. “Trends in Educational Assortative Marriage from 1940 to 2003.” *Demography* 42(4):621-646.

Stiglitz, Joseph E. 2012. *The Price of Inequality: How Today’s Divided Society Endangers Our Future*. New York: W.W. Norton.

Young, Cristobal and Charles Varner. 2013. “State Millionaire Taxes.” Pp. 149-60 in *Occupy the Future*, edited by D. Grusky, D. McAdam, R. Riech, and D. Satz. Cambridge, MA: MIT Press.

Young, Cristobal, and Charles Varner. 2015. “A Reply to ‘A Replication of “Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment”’.” *Public Finance Review* 43(2):226-234.