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How Incentives and Embeddedness Shape Millionaire Tax Flight

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Taxing the Rich:

How Incentives and Embeddedness Shape Millionaire Tax Flight[1]

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Abstract:

Taxing the rich is one of the central debates in this era of rising inequality. Elite taxation can alleviate income disparities and fund public investments. Yet, if top earners engage in tax flight, moving from high-tax to low-tax places, redistributive goals suffer as the tax base erodes. The incentive for tax flight, however, is counterbalanced by elite embeddedness – socio-economic ties to places where the rich became successful. To understand how tax incentives and embeddedness shape millionaire tax flight, we study two large-scale natural experiments. First, historic federal tax reform in 2017 changed incentives to favor lower-tax states, and tax flight was widely predicted. Second, the COVID-19 pandemic disrupted local embeddedness for those who could work remotely. We study these unique shocks using administrative data on top earners from IRS tax returns. We find that millionaires overall are highly embedded in their states, but there is a small "anomic elite" with few ties to place and high mobility. Tax reform had small effects on millionaire migration, implying the viability of high taxes on the rich. Finally, the pandemic reduced elite attachment to place, raising questions about the future of work-from-home policies and their potential impact on the geography of the elite.

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Millionaire tax flight is a prominent question in public policy today. Taxing the rich can lead to more inclusive and equitable economic growth (Parolin and Gornick 2021), but may be counter-productive if it causes the rich to flee (Young et al 2016; Kleven et al 2020; Slemrod 2000). U.S. states offer 'varieties of taxation' for top earners, and elites can avoid taxes if they are willing to move elsewhere. In 2020, for example, Elon Musk moved from California to Texas, eluding state taxes on a multi-billion-dollar payout from his made-in-California company, Tesla (Rapier 2020). This kind of mobility is a central concern for progressive taxation. Concentration of income in society means that top-earners hold the lion's share of potential tax revenues, making them high-value residents with voice and leverage in debates over taxes (Keister 2014; Piketty, Saez, and Zucman 2016; Carruthers and Lamoreaux 2016; Martin 2013). For places with open borders, taxing the rich can feel like a dangerous game of brinkmanship – a game that many states avoid entirely.

Highly-mobile elites – those willing to move for tax purposes – are a challenge to the idea that state policies can influence the distribution of income (Feldstein and Wroble 1998). Are the rich "mobile millionaires" who are readily drawn to places with lower tax rates? Or are they "embedded elites" that are reluctant to migrate away from places where they have been highly successful (Young 2017)? Progressive taxation, in many places, depends on the embeddedness of top earners. In the face of migration pressures, can states tax the rich without risking the loss of their own tax base?

Supply-side economics has long argued that taxes cause avoidance behavior and reduce the incentive to work, invest, and innovate (Prasad 2018; Slemrod 2002; Allen and Campbell 1994; Piketty, Saez, and Stantcheva 2014). Amid growing red state / blue state rivalry in the U.S. (Miller 2020), tax incentives for *migration* have become a new focus of debate. Why would rich people continue to live in New York, New Jersey, or California when they could save large sums in taxes by moving to places like Florida, Texas, or Nevada? From this view, there may be large unintended costs of progressive taxation in the form of elite tax flight.

Sociological theories, in contrast, emphasize embeddedness as a force that dampens financial incentives and creates non-pecuniary costs of migration. Migration is costly when it means a loss of socio-economic embeddedness. Millionaires often have cross-cutting socio-economic ties that grow around the places where they make their careers. Many top income-earners are the "working rich" (Piketty and Saez 2007) with employers, colleagues, and clients that they cannot take with them if they move. They are also often married, have school-aged children, own a home, and have lived in their state for many years – social factors which generally tie people to place (Young 2017; Klemens 2021). Elites may be mobile in principle but often their social capital is not; social, professional, and business networks are not individual property that relocates with a mover (Dahl and Sorenson 2012). For those with extensive social networks, moving away can lead to a large depreciation in their place-specific social capital – a key factor that keeps many people rooted in place (Coleman 1988; Dahl and Sorenson 2010).

We draw on two large-scale natural experiments to understand how tax incentives and social embeddedness affect elite location and mobility in America. First, we study millionaire migration following the largest tax reform the U.S. has seen in a generation: the 2017 federal tax bill, known as the "Tax Cuts and Jobs Act" (TCJA). This reform powerfully tested rich people's attachments to high-tax states like New York and California, as the incentives for the rich to move to low-tax states grew sharply. Many observers – including the Governors of New York and California – warned of fiscal crisis and large-scale elite migration. President Trump himself soon moved his permanent residence from New York to Florida, evidently taking advantage of a bill that he championed. Have the new tax incentives set off a wave of top earner migration from high-tax – with a corresponding loss in revenue? Or does place have durable attachment for elites even when incentives favor migration?

We also examine one of the defining shocks of the 21st century – the COVID-19 pandemic – as a disruption to local embeddedness. COVID-19 suspended many of the factors that tie individuals to place: workplaces and schools went remote, urban amenities were shut down, and face-to-face social contact became a liability. The pandemic weakened ties to place, creating new potential to live and work elsewhere. How did this disruption, coming on the heels of an historic tax reform, affect elite migration patterns? Did this shock to embeddedness set off new waves of tax migration? How important, in the end, is local embeddedness to place-based tax policies?

We draw on special access to big administrative population files from IRS tax returns, drawing information on all top income earners in the country, showing their state of residence and migration patterns before and after the TCJA, as well as during the COVID-19 pandemic. The data include roughly 450,000 tax filers per year with million-dollar incomes, and random samples of households across the spectrum, providing nearly 12 million observations in total. We combine this with strong identification: difference-in-difference analyses of migration, focusing on movement from high-tax to low-tax states in the wake of external shocks to both tax incentives and embeddedness.

Through a lens of elite tax migration, this study makes several broader contributions. First, we contribute to the study of inequality by examining the viability of progressive tax policies that aspire to shared prosperity and equitable growth. Second, we contribute to economic sociology by vividly testing the importance of embeddedness in economic life (Granovetter 1985; Polanyi 1944), notably among elites who are often seen as aloof and independent of the broader community (Young et al 2016; Reeves et al 2017). Third, we contribute to the emerging sociology of the COVID-19 pandemic (Kovacs et al 2021; Collins 2020; Kuk, Schachter, Faber, and Besbris 2021) by examining the extent to which embeddedness, geographic mobility, and state fiscal capacity were fundamentally altered.

We find that after major tax reform that increased the incentive to reside in a low-tax state, millionaires appeared strongly embedded but incentives still mattered. The TCJA did not change the probability of elite migration; but for those who moved, the TCJA changed their destinations in small but statistically significant ways that favored low-tax states. We also find that when embeddedness is weakened by a large external shock, migration increases, causing revenue losses in places with more progressive taxes on the rich. Embeddedness seems at least as important as incentives for understanding the effects of fiscal policy. This also raises questions about how the pandemic and 'work from home' policies might influence long-term changes in local social embeddedness.

Incentives, Embeddedness, and Migration

In a world with open borders, progressive taxation comes with an inherent tension. Taxes on the rich make top-earners more valuable as residents, but simultaneously create an incentive for them to move away. It is the fate of high-tax places to worry about the migration of the rich, and there are compelling reasons for concern. Elites are willing to pay to reduce their tax burden, and are known to pursue an array of instruments for tax avoidance including shell companies, family trusts, and legal services collectively referred to as the "income defense industry" (Winters 2011; Zucman 2015; Harrington 2017). Moreover, geographic mobility has increased greatly in the modern era, and the rich are often seen as a fast lane, jet-setting elite, traversing the nation and world with ease (Elliot and Urry 2010; Harrington 2017). And while transaction costs of moving – such as the expense of buying and selling a home – are significant migration barriers for many, top earners can readily finance the costs of a beneficial relocation. Thus, the rich seem motivated and mobile: highly sensitive to taxation and readily capable of exit. This suggests taxing top earners will be a growing challenge in the 21st century, especially for small regions with open borders – such as U.S. states or European Union countries (Fligstein 2008; Piketty 2014).

Yet, there are multiple problems with this portrayal. First, much tax avoidance is legal maneuvering rather than real changes in lifestyle (Slemrod 2001). The main thing rich people do to avoid taxes is hire lawyers, accountants, and wealth managers (Harrington 2017). Some strategies of avoidance are highly profitable for the rich, but it is not clear that migration is one of them. Second, perceptions of elite mobility are mostly related to top-earners' frequency of travel for business and leisure, rather than their migration per se. Mobility-as-travel is a feature of the modern age, giving rise to a sense of hyper-mobility (Elliot and Urry 2010). For example, air travel miles per person in the U.S. have grown 13-fold since 1960.[2] Over the same time, however, interstate migration rates have fallen by half, sparking a literature on why American geographic mobility is in decline (Kaplan and Schulhofer-Wohl 2017; Ferrie 2005; Klemens 2020; Kosar et al 2021). The term "mobility" is confusing because it includes things that are ascendant (travel) and things that are declining (migration). Travel is a classic luxury good, while migration is mostly an inferior good as Americans increasingly favor residential stability.

In an atomistic world without durable ties to place, one expects that tax differentials would cause large and fast migration to lower-tax places. A major factor that limits migration is place-specific social capital (Coleman 1988; Dahl and Sorenson 2010; Glaeser et al 2002). Spatial propinquity is essential to the formation and maintenance of social ties, meaning social capital and embeddedness are intrinsically place-based (Small and Adler 2019). When people migrate, "the social relations that constitute social capital are broken at each move" (Coleman 1988:S113). As Dahl and Sorenson express it, "social capital depreciates as one transports it from the regions in which it had been developed" (2012:1061).

[2] Author's calculations using data from Bureau of Transportation Statistics (2021). Air passenger miles per capita in the U.S. rose from 172 to 2,300 between 1960 and 2019.

The distribution of social capital is highly unequal; Gini coefficients for social capital are often as large as those for income, and skewed towards the rich (Young et al 2021). Top earners often have more valuable social capital, and tend to work in sectors, occupations, and positions that are more densely networked and experience high returns to interpersonal connections. High-end commercial and business markets are often characterized by "strong relationships and networks, rather than arm's-length, spot market transactions" (Hochburg et al 2007; Macaulay 1963). In high-tech hubs like Silicon Valley, Boston, and New York City, networks provide access to the currency of ideas that are shared and recombined in ways that drive the creative frontier (Sorenson 2017; Powell et al 2011; Glaeser 2011; Saxenian 1994; Nee and Drouhot 2020). Studies of the rich report high rates of civic participation, frequent co-membership in corporate boards and non-profits such as museums and art galleries, first-name-basis connections to local political leaders, and more – place-specific connections that open doors to cumulative opportunities (Burris 2005; Page, Bartels and Seawright 2013; Pichler and Wallace 2009).[3] In short, social capital and intensive networking appear as a key part of the success of top income earners, suggesting there may be high costs of exiting place-based social networks.

Place-specific social capital is also reflected in that Americans more often see themselves as "rooted" rather than "mobile" (52 versus 36 percent) (Kosar et al 2021; Fischer 2002). In contrast, 12 percent of Americans see themselves as "stuck": neither attached to place nor able to move, and they tend to have much lower incomes. This is an important distinction: the rich are not stuck in place, as some poor households are, but they are often rooted and have little intrinsic motivation to relocate. When asked what level of financial incentive could make respondents consider moving, even the "mobile" value staying in place and say they would need a 35 percent increase in their annual income to see moving away as worthwhile (Kosar et al 2021:4). By comparison, the largest income tax differences between states, even after the TCJA reform, represent about 10 percent of annual income – much less than what the mobile say would justify a move. This captures a core hypothesis: financial incentives to migrate are relatively muted and have limited effect when individuals are embedded in communities.

The 2017 Tax Reform: A Salient Natural Experiment

[3] In contrast, studies of low-income communities tend to speak of fragile families, disposable ties, and tenuous attachments (e.g., Smith 2005; Desmond 2013; Edin et al 2019).

As more states come to have one-party political control, there is growing interstate policy divergence in the U.S., so that "an individual's tax burden… and other relationships to government are increasingly determined by her state of residence" (Grumbach 2018:416; Miller 2020). Tax policy is a central area of red state / blue state rivalry. California and New York have higher taxes on millionaire incomes, while states like Florida and Texas have no state income tax at all, relying on sales taxes that fall heavily on the budgets of the poor and the middle class (Newman and O'Brian 2011). The "Tax Cuts and Jobs Act" (TCJA) poured fuel on the red state / blue state partisan divide.

The TCJA was the largest federal tax overhaul in decades. A key and controversial provision was capping the deduction for state and local taxes, known by its acronym, SALT. Prior to the TCJA, households could deduct their SALT payments so that they paid federal tax only on income left over after state and local taxes (JCT 2019). This can be understood as a federal subsidy for state governments, as it eases the political cost of taxing the rich at the state level (Hemel 2017). The deduction was mostly used by high-income households in places where state and local taxes are high – such as New York and California, rather than Florida and Texas. Capping the SALT deduction helped create clear winners and losers from the reform: for most million-dollar earners, it cut taxes in low-tax states, and raised them in high-tax states.[4] The bill created the largest increase in interstate tax differences since at least 1979.

Anxiety about the legislation and the potential for millionaire tax flight was intense and came from the highest political offices. New York Gov. Andrew Cuomo said the bill "shot an arrow aimed at New York's economic heart" (Williams 2018), adding that "people are mobile… they will go to a better tax environment" (NY State 2019). California Gov. Jerry Brown called the SALT cap "an assault by the Republicans in Congress against California" (Ashton 2018). In a *Wall Street Journal* essay titled "So Long, California. Sayonara, New York," economists predicted some 850,000 people a year would flee those states in response to the tax reform (Laffer and Moore 2018). Indeed, critics and supporters alike predicted large scale millionaire migration in the wake of the legislation.

The political acrimony around the tax bill also emphasizes how salient the SALT cap was as a centerpiece of the reform. The salience and visibility of a tax reform affects the behavioral

[4] The cap on the SALT deduction is scheduled to expire under TCJA in 2026. If elites believe that will happen, it could reduce their migration incentive in 2018.

responses to it, with greater salience leading to greater avoidance effort (Chetty, Looney, and Kroft 2009). Given both the size and salience of the reform, TCJA offers the strongest opportunity in a generation to test the influence of tax incentives on elite mobility in the U.S.

COVID-19: A Shock to Embeddedness

When the COVID-19 pandemic came in early 2020, it presented a deep shock to local socio-economic embeddedness, weakening nearly every connection to place that people have. Work, family, friendships, schools and amenities jointly represent the pull factors that keep people tied to place and willing to pay a premium for residential stability. In the first wave of the pandemic, time spent at work fell by 50 percent nationwide,[5] and the number of people swiping into office buildings in major cities fell by almost 90 percent.[6] There was a near-total closure of K-12 schools for the remaining school year (Parolin and Lee 2021), which was a strain for parents but also removed a major constraint on their mobility – moving no longer required taking their children out of school. Time spent alone increased, and time with non-household friends and family dropped sharply (Casselman and Koeze 2021). Employment in restaurants – as an index for the use of local amenities – fell by 50 percent, and food service firms went out of business in record rates.[7] In real estate, the initial lockdown caused a sharp drop in homebuying, but by May 2020, the housing market had rebounded dramatically, led by tremendous demand specifically for *second* homes (Anderson 2021).

When economic action is bound up in "ongoing structures of social relations" that shape and constrain market behavior, embeddedness provides a layer of insulation from market pressures and incentives (Granovetter 1985:481; Macaulay 1963). Embeddedness insulates households from incentives, and reduces their responsiveness to the market. Likewise, negative shocks to embeddedness should make underlying incentives more resonant and influential. When

[5] Chetty et al (2021), data available at https://www.tracktherecovery.org/.
[6] Data from Kastle Systems, a company that provides keycard access for office buildings. Data available at https://www.kastle.com/safety-wellness/getting-america-back-to-work/. Retrieved Mar. 22, 2022
[7] U.S. Bureau of Labor Statistics. 2022. "Employment, Hours, and Earnings from the Current Employment Statistics survey (National)." Retrived March 22, 2022 (https://data.bls.gov/timeseries/CES7072200001?amp%253bdata_tool=XGtable&output_view=data&include_graphs=true).

the pandemic came, those who previously felt rooted in a higher-tax community like New York faced new reason to revisit their attachments to place.

To what extent did the pandemic set off tax migration? The rich in high-tax states had the most to gain from moving, and had the resources to quickly finance a beneficial move. Did COVID-19, by disrupting social ties to place, trigger new waves of elite migration?

Evidence of Embeddedness and Tax Incentives in Migration

The social science literature on tax-flight migration is growing but without a clear consensus yet to emerge. A recent survey of tax-migration studies reported estimates ranging from zero to very large (Kleven et al 2020), with results varying by country, data source, and the nature of the tax policy under study.

In a long-term analysis of millionaire migration using tax return data in the U.S., Young et al (2016) find that (1) millionaires have low mobility rates; and (2) only a relatively small portion of millionaire migrations come with a net tax advantage. Examining a series of tax reforms in New Jersey and California, Young and Varner (2011) and Varner, Young, and Prohofsky (2018) find that changes in top taxes had little effect on elite migration. The number of millionaires moving away was very small relative to the population of non-movers that paid the new tax rate. In critical reanalysis using the same administrative data sets, Cohen et al (2015) reported much the same results for New Jersey, while Rauh and Shyu (2019) reported modestly larger migration effects for one out of the three California tax reforms studied in Varner, Young, and Prohofsky (2018). In contrast, a study examining top scientists in the U.S., concluded that “state taxes have significant effect on the geographical location of star scientists and possibly other highly skilled workers” (Morretti and Wilson 2017: 1901). Studying a wave of reforms to U.S. state inheritance taxes in the early 2000s, Moretti and Wilson (2021) found that many Forbes 400 billionaires relocated away from states that retained high inheritance taxes.

European and international research has tended to find comparatively larger tax-migration effect sizes, though partly for reasons of policy context and research design. One common finding that supports both the tax flight and embeddedness hypotheses is that *foreign-born* elites – from top soccer players to star scientists – are much more mobile and sensitive to tax rates than *domestic-born* elites (Akcijit et al 2016; Kleven et al 2013; Kleven and Schultz 2014). This finding is tempered by the fact that the foreign-born are a small portion of elites in all these studies, and policy effects depend primarily on the more embedded, native-born elites. An important study of fiscal decentralization in Spain – where tax differences between regions increased sharply – found considerable top-earner flight and revenue losses for higher-tax regions after the reform (Agrawal and Foremny 2019; see also Agrawal et al 2021). This Spanish reform was similar to how the TCJA changed tax rates across states – leading to tax rate polarization for top earners. Given this range of findings in the literature, it is unclear how much millionaire migration we should expect to see following the TCJA and the COVID-19 pandemic.

Data and Identification

We draw on confidential administrative data from IRS population files to examine how tax reform influences elite migration. Social science data sets are usually top-coded for income, so that elite earners are not identifiable. In contrast, our data include all federal income tax filers with income above $1 million, and random samples of filers with lower income.[8] We focus on those making $1 million or more in annual income, based on tax returns filed during 2016-2020 (for tax years 2015-2019), providing two full years before and after the TCJA, as well as during the first year of the pandemic.[9] Our full data set includes roughly 1.8 million observations of millionaires and 10 million observations of the general population, pooled over four years. All our analyses use sampling weights to insure descriptive accuracy. We do not adjust incomes for inflation, which can introduce potential errors (Zidar 2019:1442-43) while inflation rates are low in the years we study.

To determine state residency in each year we use information returns filed with IRS: W-2 forms that report workers' earnings, as well as other required third-party filings for interest, dividends, and other payments (Lurie and Pearce 2019; Larrimore, Mortenson, and Splinter, forthcoming).[10] These forms, which we call the W-2s for simplicity, are consistently issued in

[8] Our sample rate is 100 percent for incomes above $1 million; 50 percent for those between $500k-1M; 10 percent for those between $200k-500k; 3 percent for those between $100k-200k; and 0.4 percent for those between $100k – 0.

[9] We use four sets of two-year panels. We have filing for tax years 2015-2017 (tax returns filed in 2016-2018) that are associated with pre-TCJA and filing for tax year 2018-2019 which are two years post TCJA. So we have two sets prior to TCJA 1 set of pre-to-post TCJA and one set completely post TCJA.

[10] We use the following information returns: Form W-2 (wages), Form 1099-SSA (Social Security payments), Form 1099-INT (interest income), Form 1099-DIV (dividend income), Form 1098-E (student loan interest paid), Form 1098-T (tuition statement), Form 1099-G (certain government payments including unemployment compensation), Form 1099-MISC (miscellaneous income), Form 1099-OID (original issue discount), Form 1099-R (retirement distributions), Form W-2G (gambling winnings), Form 5498 (IRA contributions), Form 1098 (home mortgage

January each year so that taxpayers can use them to file their 1040 returns, and include taxpayer address at the end of their income-earning year.[11] In supplementary analyses, we additionally use the addresses on the 1040 returns which are filed later for robustness testing and to estimate COVID-19 effects on elite migration in 2020.

Migration is identified by year-to-year changes in the state of residency reported to IRS. We use a repeated short panel data structure. Each year, millionaire migration is defined as filers that earned $1 million or more in year t, and changed their state of residency between years t and $t + 1$. In supplementary models, we consider migration between year t and $t + 2$ to capture a possible lag in the migration response. Overall, we are able to match roughly 95 percent of our baseline millionaire sample between years t and $t + 1$. Each analysis has at least one migration wave before and after the TCJA, allowing a difference-in-difference analysis.

We compute federal, state, and local income tax rates for each tax return using the internal NBER TAXSIM program (Feenberg and Coutts 1993), supplemented with local income tax rules from a database prepared by the Tax Foundation (Walczak 2019).[12] Household-level tax rate estimates are based on information in the 1040 tax return (including AGI and income types, SALT deductions, deductions for mortgage interest, and AMT status). For each tax return, we compute tax liability in their current state, and the counterfactual liability if they were living in a different state. The difference in these liabilities, as a share of income, provides the baseline tax incentive to migrate. The *change* in these differences after the TCJA shows how much tax reform changed the migration incentives.

We error check the estimation of tax rates and drop cases where the TAXSIM estimates are clearly erroneous – such as cases with a combined income tax rate of 75 percent or higher; through this process we drop just 0.02 percent of the sample with extreme values. We control for characteristics at the household level, including marital status, business ownership, and dual-

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interest paid), Form 1065-K1 (partnership income), and Form 1120-S-K1 (S corporation income). We used the mode of the state and zip code of the primary filer information returns to assign them. We matched zip code to counties using USPS files for the crosswalk.

[11] When filing the 1040 tax returns, households have significant discretion over when in the year they file – which could be as early as January or as late as October with a no-penalty extension. The advantage of using the information returns is the address is recorded at the same time each year, as the information returns are sent to IRS at the end of the year and are always due by the end of January regardless of when the 1040 is filed.

[12] We are using a version of TAXSIM that resides on the IRS servers. Hence, no taxpayers' data moved from the IRS servers.

earner family status, as well as features at the state level, such as average incomes, residential land values, and geographic amenities such as winter temperature and summer humidity.

Tax-induced migration can occur along two different margins: (1) the decision of whether or not to move at all, and (2) conditional on moving, what destination to select. Interstate tax differences can influence both the likelihood of moving and the destination where people move to. We examine each margin in detail. Treating the TCJA as a natural experiment, we provide difference-in-differences analysis of the likelihood of elites moving, and the destination of elite migration, before and after the 2017 reform.

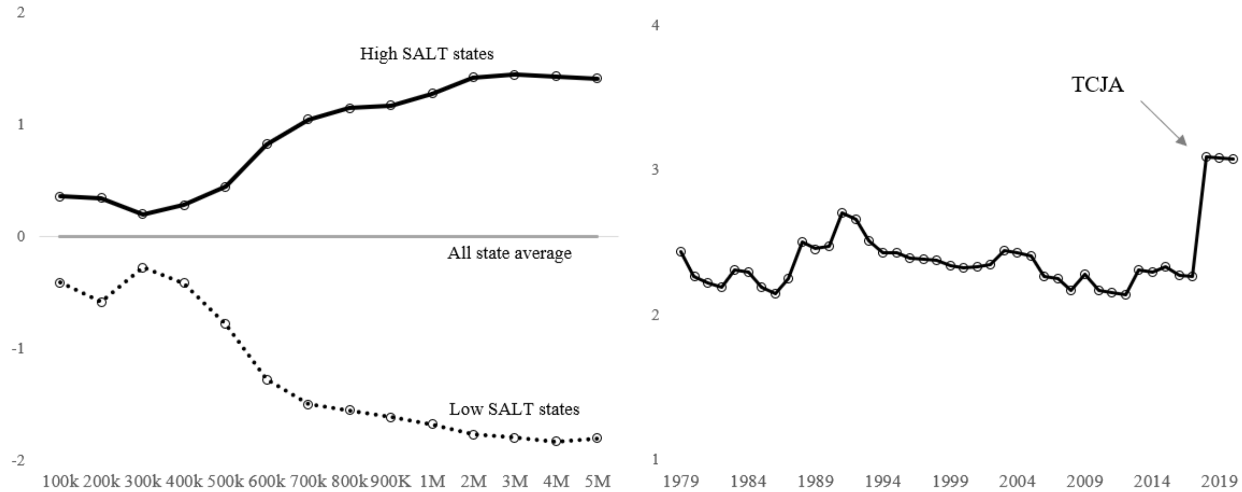
How the TCJA changed relative tax rates

To illustrate how the TCJA affected tax rates in different states, we first highlight the states with the highest and lowest state and local tax (SALT) rates on the rich. The high-SALT states are California, New York, New Jersey, Connecticut, Oregon, District of Columbia, and Minnesota, which all have a progressive income tax. Low SALT states are Florida, Texas, Tennessee, New Hampshire, Nevada, South Dakota, Washington, and Wyoming, none of which have a state income tax. With the exception of Washington, these states are representative of the red state / blue state rivalry in U.S. politics. Figure 1, panel A, shows how the TCJA changed effective tax rates relative to the mean in low- and high-tax states – by income levels. The tax bill effectively redistributed income from millionaires in high-SALT states to those in low-SALT states. Compared to the mean, those in low-SALT states received a tax cut, while in high-SALT states there was a tax increase. The differences are modest up to $500k, but rise sharply thereafter. For millionaires in low-SALT states, the reform decreased the tax rates by about 1.5 percent of annual income; in high-SALT states, it was a tax increase of 1.5 percent. This means that the tax rate in high-SALT states rose by 3.1 percent relative to the same household would pay in a low-SALT state. In short, the SALT cap produced large geographic divergence in the effects of the tax reform. Panel B shows a time-series of the difference in top tax rates between any two state pairs since 1979; the reform generated the largest increase in interstate tax differences seen in decades.

Figure 1: The TCJA and Inter-State Tax Differences in the U.S.

A. Change in tax rates by income and state group

B. Avg. interstate tax difference since 1979

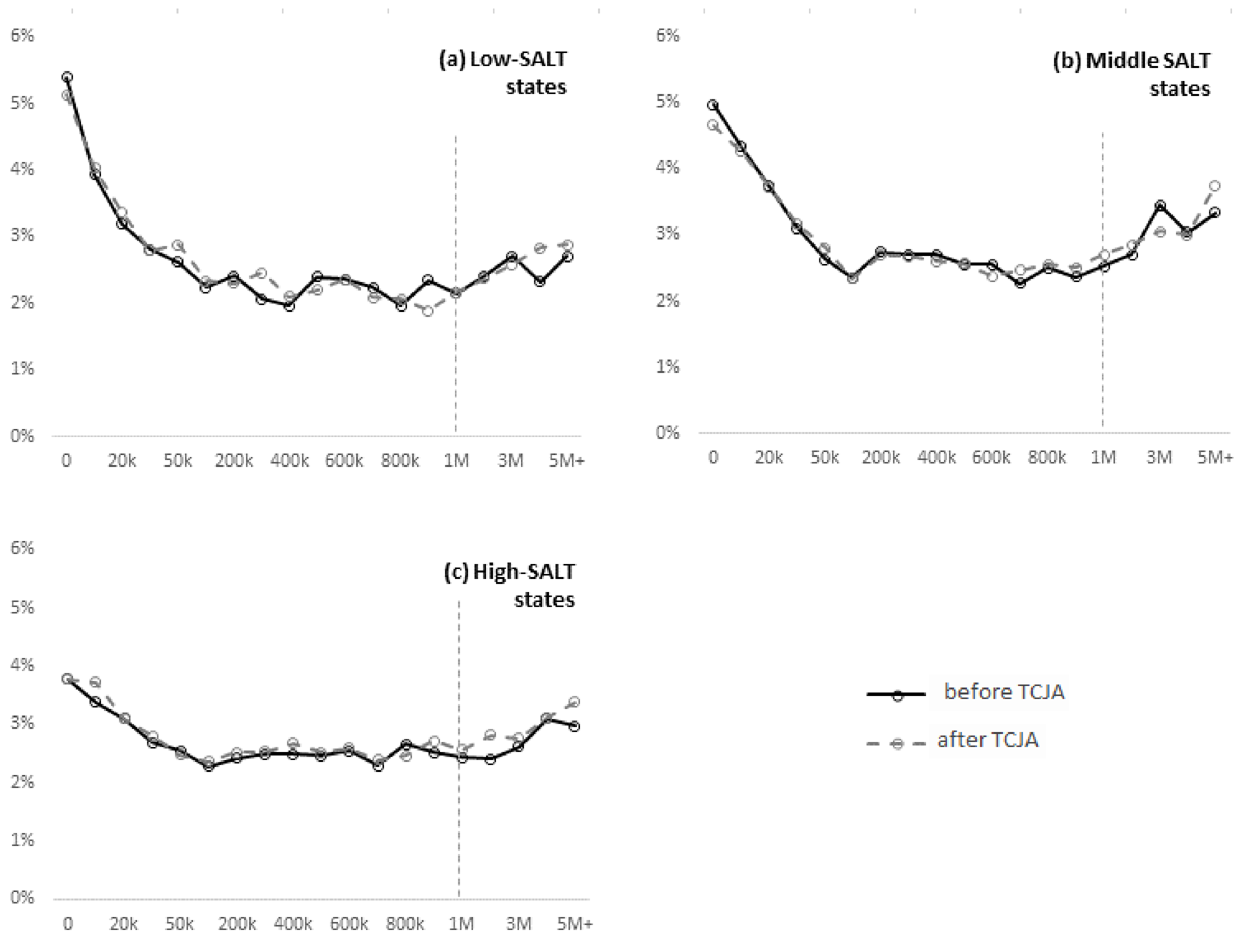


Notes: Authors' calculations using TAXSIM. High SALT states are California, New York, New Jersey, Connecticut, Oregon, District of Columbia, and Minnesota. Low SALT states are Florida, Texas, Tennessee, New Hampshire, Nevada, South Dakota, Washington, and Wyoming. Average interstate tax differences are calculated for filers with $1M income and married filing jointly. Tax rates represent combined federal, state, and local income tax liability divided by total income.

Probability of Migration Analysis

How much do incentives like tax rates affect the likelihood of migrating across state lines? We first provide a non-parametric, graphical analysis of migration rates before and after the TCJA, by income and state tax level. Figure 2 shows the income-migration slope for migrations observed in 2017 (before the reform, solid line), and in 2018 (after the reform, dashed line) for states with low, middle and high state and local income taxes. Panel (a) shows the low-tax states: top earners in these states received a tax cut that in expectation lowers their probability of moving to a different state. Panel (b) shows the middle-tax states. Panel (c) shows the high tax states: top earners here experienced a tax increase that was widely expected to increase their migration rates. It is visually evident that no group experienced a notable change in their migration rates after the tax reform. In general, interstate migration rates are highest among low income earners. Between zero and $100k in income, migration rates fall sharply. Migration remains at this low level until around $1M, after which rates begin to rise modestly. In terms of interstate migration, millionaires have only slightly higher mobility than the middle class, and lower mobility than the poor. The perception that top income earners are highly mobile is largely inaccurate; indeed, it is the poor who are most mobile.

Figure 2: Annual Migration Rate by Income Level, Before and After the TCJA



Source: Office of Tax Analysis microdata. N = 4,979,995. Low SALT states are Florida, Texas, Tennessee, New Hampshire, Nevada, South Dakota, Washington, and Wyoming. High SALT states are California, New York, New Jersey, Connecticut, Oregon, District of Columbia, and Minnesota. Middle SALT states are all others. Tax rates represent combined federal, state, and local income tax liability / total income.

Regression Analysis

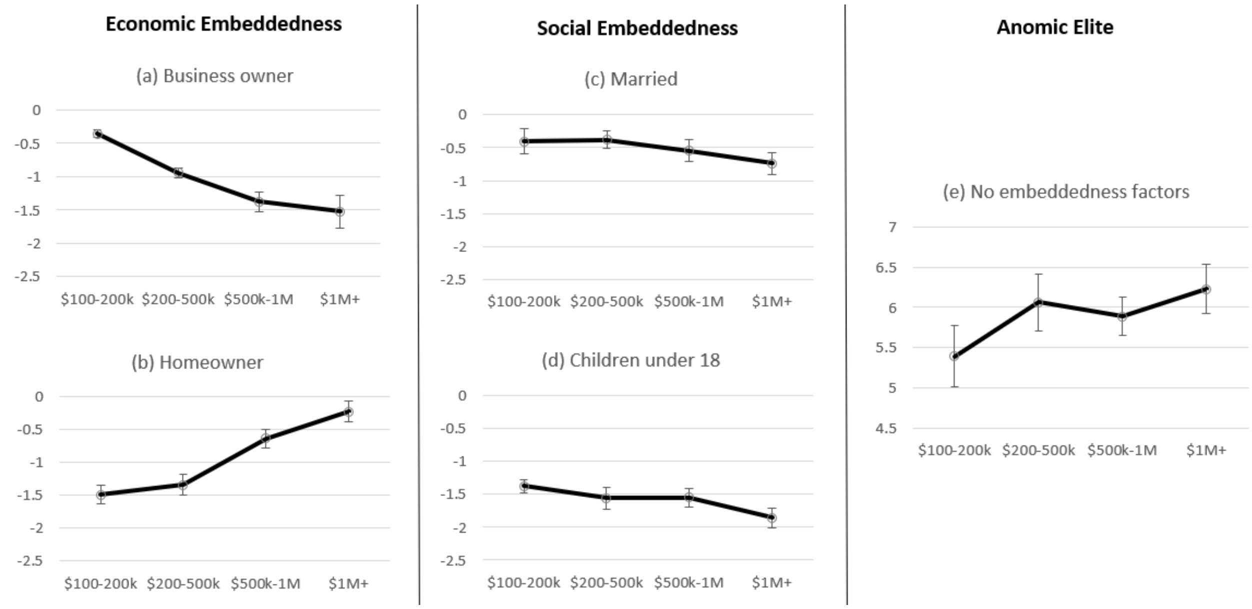
Next, we extend the analysis to a difference-in-differences regression setting, and incorporate non-tax predictors of mobility and embeddedness. The outcome variable is an indicator M_{it} for whether a household i moves across state lines between years t and $t + 1$. The main tax variables are the tax rate households paid in year t, the counterfactual tax rate they would have paid in year t if they lived in Florida (representing the zero income tax states), and the change in that difference occurring in year $t + 1$. This tests the hypotheses that paying a relatively high tax rate leads to higher migration to other states in general, and that the TCJA caused greater migration. Our measures of economic embeddedness are status as a "capitalist" (earning 75 percent or more of income from capital, rather than from employment) and whether the household owns a business, and owns a home. While capitalists – versus the working rich – are expected to be more mobile, owning a business makes migration a more complex problem involving connections to customers, suppliers, and workers that do not automatically move along with the firm. Measures of social embeddedness in year t include family status (married versus single, and sole-earning family versus dual-earner), parental status (dependent children under age 18), and age.

Results are shown in Table 1. In model 1, we include two core tax measures that describe rates before and after the TCJA. First is the baseline relative tax rate - the household's income tax rate minus what they would pay in Florida. This coefficient indicates that when the effective tax rate is one point higher than in Florida, the migration rate 0.05 percentage points higher – a negligible effect. Second is the change in the relative tax rate between years t and $t + 1$ – the TCJA difference-in-difference estimate – which also has a small, non-significant coefficient.

Model 2 incorporates the economic and social characteristics of households, most of which have substantial effects on migration, but do not notably change the tax coefficients. Models 3 – 5 run the same specification on income groups that faced consecutively smaller treatment under the TCJA: those making $500k-1M, $200k-500k, and $100k-200k. No tax effects are observed for any income group. In Appendix I, we conduct the same analysis for migration between years t and $t + 2$, allowing migration to occur with a lag; the results are substantively the same

[Table 1: Probability of Migration, 2015-2018]

Figure 3. Effects of Embeddedness Factors by Income Level



Note: Coefficients and Standard Errors reported in Table 1. “No embeddedness factors” is computed for “capitalist” = 1, and all other embeddedness variables = 0.

Figure 3 shows how embeddedness factors have differing force by income level. The dynamics of economic embeddedness are shown in the first vertical column: business owners and home owners. Both these factors reduce migration and attach people to place. But how they interact with income is very mixed. The more money business owners make, the less likely they are to move (a). Business is place specific: the more successful the business, the more the owners are tied to place. Homeownership is also a place specific asset, but in contrast, it’s embedding force *diminishes* with income. Owning a home is strongly embedding for the middle class, but the richer the homeowner, the less homeownership limits migration (b). In short, place-specific assets vary in their importance by income levels. For the rich, what ties them to place is not their home ownership but much more their business ties – perhaps because their businesses are a nexus of non-replaceable ties among customers, employees, and co-owners.

The second column of Figure 3 shows the key *social* embeddedness factors: marital and parental status. Marriage follows a similar pattern as business ownership: married households have strong ties to place, and place-attachment grows with income. Among the married, millionaires are less mobile than the middle class. Parental status also serves to ground people in place and lower their residential mobility. Indeed, for millionaires, the single most important embeddedness factor is having school-age children. These ties of family are always influential for migration, but are especially binding for the richest households. The social ties often lead top-earners to favor greater residential stability.

The final panel (f) shows migration rates by income for those with no embeddedness factors: mainly, those who do not own a business or a home, are not married and have no school-age children.[13] For these unattached elites, whom we might call the 'anomic rich,' residential mobility is high and rises with income, much as expected under the mobile millionaire hypothesis. Yet, very few top-earners fall into the 'anomic' category.

Overall, these results indicate that neither baseline tax rates nor the TCJA influence the likelihood of migrating across state lines. Millionaires in high-tax states do not move any more often than millionaires in low-tax states, and no significant change is observed after the tax reform. These results also provide fruitful insight into the socio-economic factors that tie millionaires to place.

Millionaire Destinations: Gravity Model

Next, we shift analysis from the decision to move, to the choice of destination. Focusing entirely on movers, we analyze millionaire migration flows between each state. Conditional on moving, do millionaires tend to move to lower-tax states? Did the TCJA change the likelihood that millionaire migrants choose lower-tax destinations? Conceptually, each year migration is represented as a matrix of flows between every possible pairing of states. We first use the baseline difference in the top tax rates between states as a general explanation of these migration flows. Second, we use the change in the tax differences caused by the TCJA as our key policy variable of interest.

To formally analyze these data, we use the gravity model of migration (Young et al 2016; Santos Silva and Tenreyo 2006). The number of migrants (M_{ijt}) 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 $\{i, j\}$

[13] Smaller factors in this definition are earning income mostly from capital rather than employment, and being young relative to their income bracket (years under age 50).

have a shared border ($Contiguity_{ij}$). These are the core elements that define the basic laws of gravity for interstate migration (Santos Silva and Tenreyro 2006). To understand the effect of taxation, we include the pre-TCJA difference in tax rates between each state pair (τ_{ij}), as well as $\Delta\tau_{ij}$ capturing how much those cross-state tax differences changed after the passage of the TCJA in 2017. Finally, we specify this as a log-linear model, taking logs of the righthand side count variables, and estimating with Poisson:

$$Mig_{ijt} = \exp(\alpha + \beta_1 \log Pop_i + \beta_2 \log Pop_j + \beta_3 \log Distance_{ij} + \beta_4 Contiguity_{ij} + \beta_5 \overline{\tau_{ij}} + \beta_6 \Delta\tau_{ij}) + \varepsilon_{ij} \qquad (1)$$

The tax coefficients from this model give the semi-elasticity of migration flows with respect to the tax rate—the percent change in migration flows for each percentage point difference (or change) in tax rates. These flow elasticities are not the target estimand; for full interpretation, these estimates will be used to compute population elasticities: the percent loss of millionaire population for a percent change in the top tax rate.

Results

Table 2 shows regression results. The interstate tax difference has a significant impact on millionaire flows, with a semi-elasticity of −.077 (model 1). Migration tends to flow from high-tax to low-tax states, and migrations flows are larger when the tax advantage is greater. Model 2 incorporates a basic set of state level controls, addressing winter climate, alternative tax instruments (sales and property tax rates), states' economic strength (unemployment rate and per capita income), and the price of residential land. These variables have little impact on the tax migration estimate. Model 3 adds the change in the cross-state tax difference due to the TCJA ($\Delta\tau_{ij}$). This difference-in-difference coefficient is –.052 and statistically significant, similar in magnitude to the effect of the average, or long-run, interstate tax difference (-.68).

The TCJA did not change the probability of elite migration. However, for those who moved, the TCJA changed their destinations – making lower-tax destinations more attractive. How large is the magnitude of this effect, and what impact does it have on states' fiscal capacity?

[Table 2: Gravity models of millionaire migration, 2015-2019]

Population Elasticities

The effect of taxes on millionaire migration can be expressed in two different ways: (a) change in the *flow* of millionaires, and (b) change in the *population* of millionaires (Kleven et al 2020). For policy purposes, what matters is the change in the population of top taxpayers: what percent of millionaires are lost when tax rates rise? Our long-run estimates indicate that a one percentage point increase in a state tax rate will lead to a 6.8 percent drop in *migration flows* into a high-tax state. However, since these flows are themselves small in magnitude, this translates into a small change in millionaire population. The elasticity of millionaire population with respect to the top tax rate is 0.14. For the average state, if tax rates rise by one percent, this causes roughly 13 more out-migrations and 12 fewer in-migrations, from a base population of over 9,000 millionaires – amounting to a population loss among millionaires of one-third of one percent (see Appendix IV for greater detail).

Our D.i.D. estimate from the event of the TCJA tax reform is -0.052, which is similar to the long-run estimate. To retrieve the total effect of the TCJA for a state, we multiply this semi-elasticity by the state-specific tax change and the state-specific millionaire population. For California, the TCJA produced a loss of roughly 380 millionaires from a base population of 81,000 (i.e., 0.5 percent of the population). Similarly, we calculate that Texas gained 140 millionaires due to the TCJA, a 0.4 percent increase on its base population of 39,000 millionaires.

Optimal Tax Rate

We incorporate these results into a model for the optimal tax rate on top incomes (Diamond and Saez 2011; Piketty and Saez 2013; Kleven et al. 2013; Moretti and Wilson 2019). If a state aims to maximize revenue, the optimal top state tax rate, τ^*, is given by three factors: (1) a Pareto statistic reflecting the portion of total income held by millionaires, a, (2) the elasticity of taxable income, e, 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):

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

This formula reflects the idea that when the top tax rate increases, people with top incomes (reflected in the parameter a) may avoid taxes by reporting lower earnings (given by e), or by moving to a lower-tax jurisdiction (given by η). Given the income in a and the avoidance responses found in $e + \eta$, what tax rate maximizes revenues from millionaires? We do not estimate a and e but draw on credible estimates from existing literature ($a = 1.5$, $e = .25$) (reviewed in Saez, Slemrod, and Giertz 2012). In the absence of tax migration, the optimal tax rate would be 73 percent $\left(\frac{1}{1+1.5*.25} = 0.73\right)$, as reported in Diamond and Saez (2011).[14] Adding our population elasticity ($\eta = .15$) into Equation 2 gives an optimal tax rate on top incomes of 66 percent $\left(\frac{1}{1+1.5*.25+.15} = 0.66\right)$. Millionaire migration helps set a ceiling on the tax rate that states can feasibly apply to top earners, but no U.S. state has millionaire tax rates even close to this upper limit.

As a caveat, this estimate of the optimal tax rate must be understood as a partial equilibrium analysis that does not include secondary impacts of migration. There may be spillover effects that come from the loss of high skill individuals that reduce the dynamic drive or innovativeness of firms and the local economy. For example, if LeBron James leaves the L.A. Lakers, it could harm the performance and productivity of the remaining players. On the other hand, this analysis also does not consider vacancy chains. When migration occurs, structural positions tend to get filled, not lost. If the CFO at CitiBank moves from New York to Florida, this does not mean there will be one-fewer top earners in New York. Rather, the departure will create an opportunity as someone is promoted into the open CFO position, in turn creating a new vacancy below, into which someone else is promoted, and so on (White 1970; Chase 1991). While there are likely both spillovers and vacancy chains involved in top-income migration, their relative effect sizes are unknown.

Multiverse Analysis: Model Robustness

There are many different ways regression models can be specified. How robust are these findings to any number of plausible methodological revisions? We draw on multiverse methods

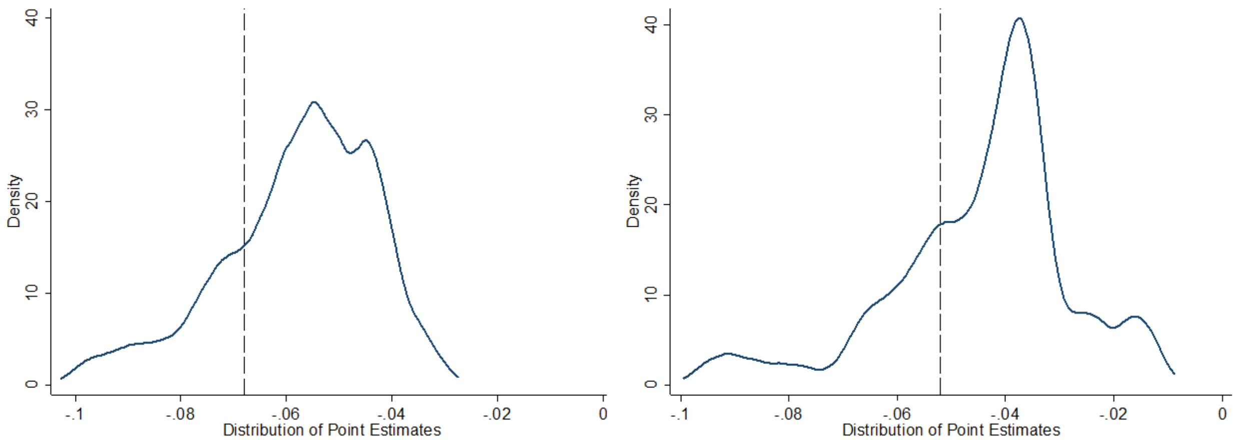
[14] Uncertainty in this estimate stems from the range of findings for the parameter e, the elasticity of taxable income. Critics of Saez and Diamond (2012) have argued that $e = .25$ is too low, and should be revised to around 0.40 (Mathur et al 2012). Under this assumption for e our estimate for the optimal tax rate would be 57 percent rather than 66, which would not change policy implications.

to evaluate robustness with respect to model assumptions, computationally testing across more than 6,000 alternative model specifications (Young and Holsteen 2017; Steegan et al 2016). First, we consider alternate sets of control variables; we treat the origin and destination populations are key elements of a gravity model that must be included; all other controls in model 3 we treat as debatable – meaning they could be included or excluded. Our control variable multiverse estimates all unique combinations of these controls, providing $2^9 = 512$ models. We also consider plausible choices about data measurement issues, using migration from the 1040s rather than the W2s, and consider three different ways of defining millionaire income: adjusted gross income (AGI), AGI minus capital gains,[15] and total gross income. Estimating each data choice with all combinations of the controls yields a multiverse of 6,144 models. Figure 4 panel (a) shows the modeling distribution for the effect of the average tax difference. The preferred estimate is strongly robust: all estimates are negative and statistically significant; while it is possible to find estimates that are somewhat larger or smaller in magnitude, the core conclusion is not affected by any of these modeling decisions. Panel (b) in Figure 4 shows the modeling distribution for the difference-in-difference estimate of the TCJA effect. Our preferred D.i.D. estimate is towards the negative tail of the distribution (a stronger tax effect), but still largely consistent with what other plausible models report. In short, the results do not seem to depend on idiosyncratic modeling assumptions (Leamer 1983).

[15] Capitals gains income rose sharply during the time period of our analysis, which notably increased the proportion of households that filed with million-dollar incomes. Excluding capital gains provides away to smooth over any effects of this population change.

Figure 4: Multiverse Analysis

(a) Average Tax Difference Coefficient **(b) DiD Coefficient**



Note: Estimates from 6,144 models. The dashed line shows the estimates from Table 2, model 3, which is our preferred estimate. The multiverse analysis estimates all possible combinations of the following control variables: log distance, contiguity, winter temp, July humidity, sales tax difference, property tax difference, unemployment, average income, log land value, in addition to two linking methods (info returns vs. 1040s), three income definitions (AGI, AGI minus capital gains, and total income), and two functional forms (Poisson, negative binomial).

Embeddedness and the COVID-19 Pandemic

When the pandemic came, many of the factors that tie people to place were suspended: offices and schools closed their doors and moved online, urban amenities were shuttered, and face-to-face contact became a public health problem. Many homes and apartments felt too small for shelter-in-place orders. The pandemic was an occasion to rethink the geography of work and life, especially for top earners who could work remotely from anywhere. We test whether this disruption to embeddedness ushered in a new wave of millionaire migration away from high-tax places.

The timing of the tax return data offers a unique way to understand COVID effects on tax migration. Recall there are two kinds of IRS records that show taxpayer residency: W2 forms that report earnings and other information, and the 1040 tax returns that households file. These forms are sent to IRS at different times, offering a before-after analysis of the onset of the pandemic. In 2020, W2 forms were sent about six weeks before the U.S. declared COVID-19 a national emergency on March 13. The deadline for filing 1040 returns, in contrast, was delayed until mid-July. This means that migration measured by the W2s captures mobility occurring entirely *before* the pandemic, while migration using the 1040 returns includes moves occurring in the first four to eight months of the pandemic.[16]

We estimate migration using both measures – the W2s sent in January, and the 1040 returns filed mid-year or later, and look for patterns of differences in migration before and after the onset of COVID. Similar before-to-during analyses have found a sharp rise in loneliness and a steep drop in trust in government during the pandemic (Kovacs et al 2021; Bor, Jørgensen, and Petersen 2021).

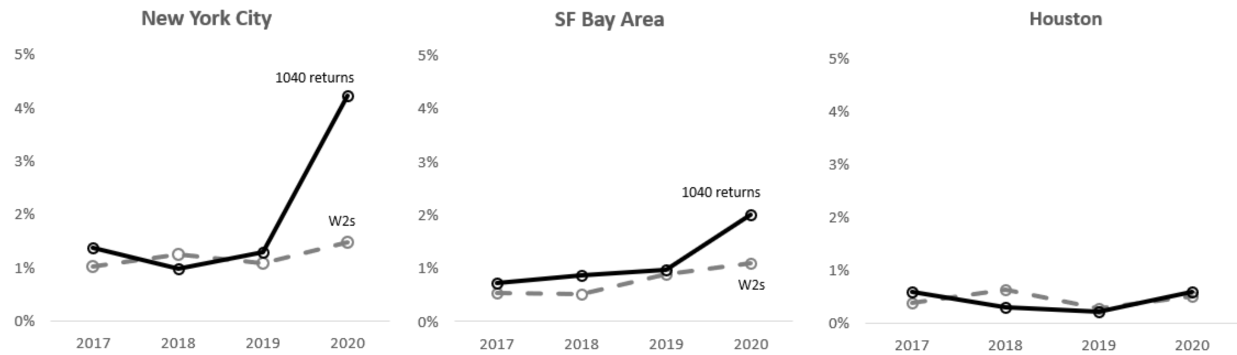
City Illustrations

To illustrate our analysis, consider the five boroughs of New York City (figure 5). During 2017-2019, the W2s and the 1040s showed the same steady net migration rate. However, patterns in 2020 diverge sharply; the W2s (filed in January 2020) show a slight change (+0.4 percentage points) while migration in the 1040 returns (filed on average in August 2020) rose dramatically (+3.0 percentage points). This suggests about 2.6 percent of NYC millionaires

[16] We exclude from the 1040 data roughly 12 percent of households that filed early – before the pandemic was declared.

moved to a different state due to COVID (a similar proportion left the city but remained in New York state (results not shown)). A similar pattern is seen in the Bay Area of California, but the Covid-19 out-migration was smaller. The W2s show a rise in net out-migration of 0.2pp, while the 1040s show a 1.0pp rise, implying that 0.8 percent of Bay Area millionaires moved out of state. In Houston, Texas, a high-density metropolis in a low-tax state, there are no COVID effects observable: Houston's net out-migration of millionaires remained constant at about 0.4 percent a year, in both the W2s and the 1040s. This shows COVID migration was not uniform, occurring in some places but not others.

Figure 5. Net Millionaire Migration to other States, in Selected Cities

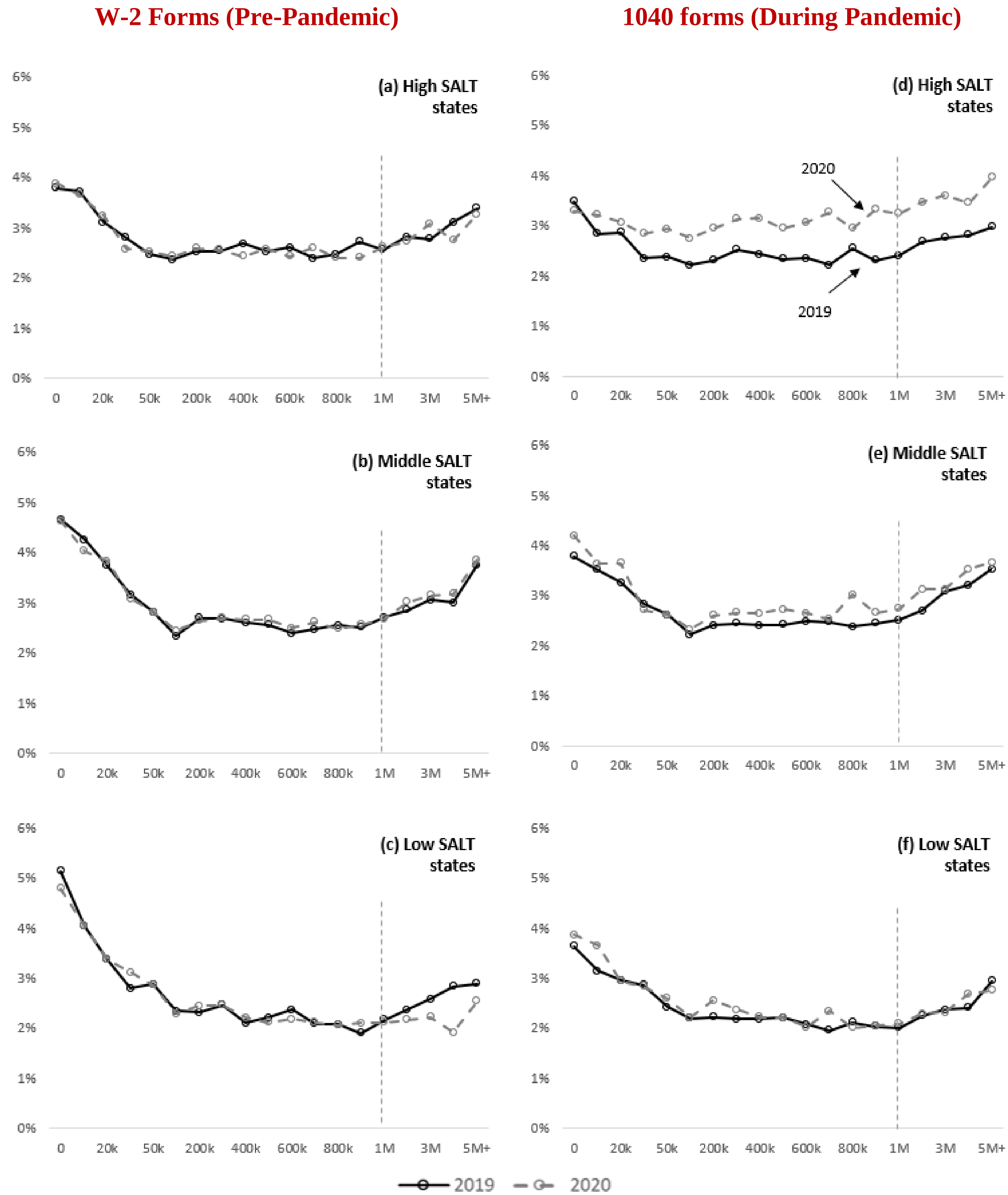


Notes: 1040 returns show household location after the pandemic began in 2020 (filed on average in August); the W2 forms were filed in January 2020, showing location immediately before the pandemic. The difference provides an estimate of pandemic-induced migration.

For a more detailed view, Figure 6 shows migration rates by income level, immediately before (left column) and during (right column) the pandemic. The W2s show that 2020 began as a normal year: migration rates by income were identical to the year prior. The 1040 returns filed mid-year show migration rates are elevated, but only for those in high-tax states. The first row of Figure 6 shows migration by income in high-tax states, where we see a clear increase in migration after the onset of the pandemic. This reflects an out-migration of about 0.6 percent of the population overall, and about 0.75 percent of the population earning $500k or more.[17] In the second row, we see the pandemic sparked a slight migration in the middle tax states. Finally, the third row shows low-tax states where there is no before-after difference observable in any portion of the income distribution. COVID migration appears as a feature of high tax states. It is not specific to millionaires, but is strongest among high income earners and negligible for those at the bottom of the income distribution.

[17] While New York City alone accounts for a significant portion of this migration, we see the same pattern in migration out of high-tax states even after excluding NYC.

Figure 6. Migration Rates by Income Level, State Tax Level, Before and During Covid-19



Notes: the W2 forms were filed in January 2020, showing location immediately before the pandemic. The 1040 forms show household location after the pandemic began in 2020 (typically filed in August). The difference (left column versus right column) provides an estimate of pandemic-induced migration.

COVID migration was place-specific, and only appeared in high-tax places. Yet, this interaction with taxes may have alternative explanations. The first wave of the COVID-19 pandemic hit the northeastern US and the west coast the hardest, where the high-tax states are located. To account for features of the pandemic that may have coincidental correlations with state tax policies, we revisit the probability of migration analysis (as in Table 1 above) and incorporate COVID infection rates and population density at the county level – factors that were likely contributors to pandemic-era migration.

[Table 3: Probability of migration models, filing years 2019 and 2020]

In Table 3, we model the household-level probability of migration for the calendar years 2019 and 2020, focusing on the arrival of the pandemic. We begin with a dummy variable for 2020, which shows no increase in migration pre-COVID (model 1), but a substantial increase during COVID (model 2). Specifically, the model 2 coefficient of 0.443 indicates a roughly 0.4 percentage point nationwide increase in the millionaire migration rate. In models 3 and 4, we add the household tax rate and interact that with the 2020 dummy. This allows the tax rate to affect migration overall, and for the tax rate to have a different effect on migration in 2020. In the W2 data, neither the tax rate nor its interaction with 2020 are significant. However, in the 1040 data observed during COVID, there is a significant tax rate × 2020 effect. The semi-elasticity from model 4 (0.086) implies that states lost nearly 0.1 percent of their millionaire population for each point of income tax on top earners. This indicates that tax rates affected the probability of migration, but only after the pandemic began. Models 5 and 6 add controls for the county-level COVID infection rate (measured in May 2020) and county-level population density, also interacted with 2020. In the W2 data, neither COVID cases, nor population density, nor their interactions with 2020 have any significant effect. However, both interactions are significant in 1040 data, showing that interstate migration by mid-2020 was motivated by avoidance both of high COVID cases rates and high population density. These two covariates reduce – or account for – some of the 2020 tax effect, as the tax × 2020 estimate falls by roughly half to 0.046, although it remains significant.[18] (The main effect of year 2020 in the interactive model 6 is -1.2

[18] For the highest tax states with a 10-percentage point higher effective tax rate than Florida, this would mean a loss of nearly one half of one percent of the millionaire population due to the pandemic.

and statistically significant, but this estimate is specific to millionaires in places with the lowest population density and lowest COVID rates; these households were less likely to move than others.) In supplementary models (not shown) we add an interaction with the cost of housing (average home value) in a county. The results are significant and also seem to 'explain away' the effect of taxes in 2020. We note this only to say that cost of living is a rival explanation, and there is strong correlation between progressive tax rates and housing costs (i.e., places that tax the rich also have high housing costs) – a collinearity that COVID does not help us disentangle.

Going further, we conduct a placebo test of the 2020 tax effect. We look at a form of migration that should *not* be influenced by tax differences: the decision to migrate to a different county in the same state. Cities like New York and San Francisco experienced large migrations out-of-state (as shown in Figure 5 above) but also to other places within their state borders, such as upstate New York or Sacramento. These places offer reprieve from high-cost, high-density metropolitan living, but little tax relief for the rich. In model 7, we switch our outcome variable from out-of-state migration to within-state (cross-county) migration. We see a significant 2020 effect of moving away from high population density, but no tax effect. The pandemic produced both in-state and out-of-state migration, but only the later was influenced by taxes – consistent with a causal effect of taxes.

Finally, as noted above, tax migration can occur along two distinct margins: the decision to move (analyzed above), and the choice of destinations. Among those who moved during the pandemic, was there also a change in the destinations of elites? In Appendix V, we show the gravity models of interstate tax differences for movers over multiple years (2017-2020), which shows the pandemic did not change overall destination patterns. There were more out-of-state millionaire migrants during the pandemic, but the pre-existing tendency to (modestly) favor lower-tax states was unchanged.

Overall, these results show that COVID-19 weakened the embeddedness of the elite, with top earners moving to less expensive, lower-tax places. In graphical models, COVID-induced migration from high-tax states is visually striking, especially since millionaire migration is normally very stable and even the federal tax reform did not affect the overall levels. As a fraction of the millionaire population, tax flight during the pandemic was modest in magnitude – the highest tax states lost one-half of one percent of their millionaire base. Still, these results establish causal connections between embeddedness, taxation, and migration, and raise questions about the long-term implications of the pandemic for mobility and attachment to place.

Discussion and Conclusion

Taxing the rich is one of the central policy debates in this age of rising inequality. Elite taxation can reshape the distribution of income in society while financing public goods and services that improve quality of life for everyone. These goals are hard to attain, however, if taxes lead to high levels of millionaire flight.

Tax flight occurs at the intersection of incentives and embeddedness. Scholars of incentives often expect taxes will have enormous effects on elite mobility; scholars of embeddedness often believe pecuniary incentives are greatly muted by interpersonal ties, opportunity networks, and durable attachment to place: place-specific social capital. When economic action is embedded in ongoing social relations that shape and constrain market behavior, embeddedness gives a layer of insulation from market incentives (Granovetter 1985:481; Macaulay 1963). This debate has important implications for the capacity of states to influence the distribution of income in society.

We study the roles of embeddedness and incentives in elite tax flight across two large-scale natural experiments: the 2017 federal tax reform that created new incentives for rich people to move, and the onset of the COVID-19 pandemic that disrupted almost everything that ties people to place. The first was a shock to tax incentives, the second a shock to embeddedness. We examine how each separately influenced migration of top earners, drawing on big administrative data from Internal Revenue Service population files – providing millions of observations of millionaire residency and migration before and after both shocks.

We find that millionaires typically have low rates of migration – much lower than that of the poor – and they are rooted in place by socio-economic ties such as employment, marriage, children, and business ownership. We only see high mobility among the 'anomic rich' – those with few observable socio-economic ties, who are a small minority of millionaires. In terms of tax incentives, high-tax states do not have higher millionaire migration rates than low-tax states, and when the 2017 tax reform increased the incentives to reside in a low-tax state, it did not affect the probability of migration among the rich. However, tax incentives did influence the choice of destinations for those who moved after the TCJA – the number of movers did not change but lower-tax destinations became more favored. As a result, states like New York and California incrementally lost millionaire population, while Florida and Texas gained. The magnitudes were small relative to base populations – states like California and New York lost roughly one-half of one percent of their millionaire population. To counteract this migration, states could cut taxes on the rich, attempting to lure back missing millionaires, but doing so would lead to even larger revenue losses. Indeed, the revenue-maximizing tax rate on millionaires is higher, rather than lower, than current rates anywhere in the U.S. Thus, while the TCJA indeed benefited low-tax states at the expense of higher-tax ones, progressive taxation still generates large revenues for public policy programs and states have considerable fiscal capacity to set their own policies. Many of the high-profile claims about tax migration following the TCJA – from both critics and supporters – can be understood largely as political discourse.

We also see that the pandemic disrupted people's ties to place; work from home policies, school closures, and lockdown separation from friends and family led many to decouple where they live from where they work. This sparked a new migration that was concentrated among high-income earners in high-tax states. Once pandemic restrictions arrived, rich households began questioning the value of living in expensive, high-tax states. In this sense, diminished embeddedness raised the tax-flight cost of taxing the rich.

Embeddedness and State Capacity

These results emphasize that embeddedness is a critical parameter for public policy and place-based governance. In one sense, social capital has long been recognized as a factor that influences the quality and capacity of government. Civic participation and voluntary organizations help to ensure government policy follows community goals, and monitors state performance in the delivery of public services (Putnam 2000; Guiso et al 2011). This study suggests another pathway, in which *place-specific* social capital – local embeddedness – reduces the threat of exit when costly policies are enacted. Embeddedness means that places are able aspire to larger and more far-sighted policy goals.

New policy initiatives in areas like education, health care, or climate change often involve years of upfront costs before the full public benefits begin to materialize. Investments in early childhood education, for example, generate societal benefits that pay for their programs many times over; but these gains accrue over the course of entire lifetimes (Heckman 2006;

García, Heckman, Leaf and Prados 2017). Climate change poses potentially catastrophic costs to society, but mitigation means that "environmental policy action must often be imposed long before its benefits will arrive" (Jacobs 2016:437). There are similar gaps between spending and payoff in healthcare, higher education, and infrastructure like high-speed rail or coastal seawalls. Most of these programs require a medium or long time-horizon for the benefits to be fully worth their costs to taxpayers. If the rich flee places that tax them, this hobbles far-sighted policy-making that accepts short-term pain for long-term gains.

The problem of taxpayer flight is akin to investor short-termism in the corporate sector, where too many short-term investors – shareholders who buy or sell based on the latest quarterly report – drive a myopic focus on immediate profits at the expense of long-term, sustainable value creation (Mizruchi 2013; Barton 2011). States often struggle with the same dilemma of paying for programs today when they mostly produce benefits in the future. If the long-term societal returns from public programs appeared instantaneously, the politics of funding them would be much simpler. In practice, taxpayers are asked to finance new initiatives that are expected to break even five to 25 years into the future. For this reason, embeddedness of the tax base is central to making investments in the future. What is important for states to understand is that top taxpayers act more like long-term investors rather than day traders 'selling' whenever a tax differential emerges.

Policy makers often assume by default that the way for a place to be 'competitive' is to be like Texas: a low-tax, low-infrastructure, low-services state. Lower costs and lower taxes are always attractive in the short run. Yet, if tax dollars are invested in ways that ultimately improve quality of life, then provision of high-quality public goods and services is a rival and potent pathway to competitiveness. When top tax-payers have, as we see here, low mobility and limited responsiveness to tax changes, millionaire taxes can serve as an endowment fund that attracts and retains the next generation of high-skill workers through investments in quality of life. This is the 'blue state model' of high taxes coupled with high services and public infrastructure. In a long-term system of overlapping generations, the late-career working rich – the embedded elite – finance investments that support the ongoing vitality of places for the next generation. This is partly why New York and California, despite being high-tax states for nearly 100 years, continue to be the dynamic centers of American capitalism.

Still, a challenge for places with progressive taxes is that embeddedness is weakened due to COVID-19, while tax migration incentives have grown due to the 2017 federal tax reform. This is not the fiscal crisis that was predicted after the TCJA – high-tax states continue to have a much larger millionaire population than low-tax states, and migration effects were modest – but it raises questions about the future of embeddedness. What are the long-term implications of the pandemic? Elite workplaces in technology and finance once regarded face-to-face interaction as essential to their business, but the pandemic challenged this belief and showed remote work to be more viable than imagined. Are work-from-home policies here to stay, or will elite offices return to something of their pre-pandemic concentrations in major cities? Will remote technologies make place-specific social capital less important in the future? Some argue that many top earners will become 'digital nomads,' working remotely with no fixed address or state of residency (Agrawal and Stark, Forthcoming). This would pose a serious challenge to place- and state-based systems of taxation. Others suggest hybrid workplaces will become the norm, with alternating days between home and office (Bloom 2022). Hybrid workplaces ease the commute and allow people to live further from work, but more like in the suburbs of global cities rather than in Texas or Nevada. Moreover, work is not all that ties top-earners to place: just as important is having school-aged children. The national experiment with remote learning during the pandemic was disastrous – young learners needed face-to-face, place-based interaction in school far more than their parents needed it at work (Betthäuser et al 2022). The family lives of elites will continue to be a source of embeddedness, even if elite work fully decouples from place. Further research on these fronts – and on the enduring importance of place – will shed valuable light on the future of high-tax, high-amenity places in the U.S. and abroad.

References

Agrawal, David and Dirk Foremny, 2019. "Relocation of the Rich: Migration in Response to Top Tax Rate Changes from Spanish Reforms." *Review of Economics and Statistics*. Vol. 101(2):214-232.

Agrawal, David, Dirk, Foremny, and Clara Martínez-Toledano. 2020. "Paraísos Fiscales, Wealth Taxation, and Mobility." EB Working Paper N. 2020/15, Columbia Business School Research Paper.

Agrawal, David and Kirk Stark. (Forthcoming). "Will the Remote Work Revolution Undermine Progressive State Income Taxes?" *Virginia Tax Review*.

Akcigit, Ufuk, Salomé Baslandze, and Stefanie Stantcheva. 2016. "Taxation and the International Migration of Inventors." *American Economic Review*. Vol. 106(10):2930-2981.

Allen, Michael Patrick, and John L. Campbell. 1994. "State Revenue Extraction from Different Income Groups: Variations in Tax Progressivity in the United States, 1916 to 1986." *American Sociological Review.* Vol. 59(2):169-186.

Anderson, Dana. 2021. "Demand for Second Homes Is More Than Double Pre-Pandemic Levels." *Redfin*, May 10. Retrieved March 22, 2022. (https://www.redfin.com/news/second-home-demand-doubles/).

Ashton, Adam. 2018. "Wealthy exodus to escape new tax rules worries California Democrats." *Sacramento Bee*. January 18.

Athey, Susan and Guido Imbens. 2015. "A Measure of Robustness to Misspecification." *American Economic Review: Papers and Proceedings*. Vol. 105(5): 476–480.

Bor, Alexander, Frederik Jørgensen, and Michael Petersen. 2021. "The COVID-19 Pandemic Eroded System Support but Not Social Solidarity." Working Paper. PsyArXiv.

Betthäuser, Bastian, Anders Bach-Mortensen, and Per Engzell. 2022. "A systematic review and meta-analysis of the impact of the COVID-19 pandemic on learning." Working Paper. SocArXiv.

Bureau of Transportation Statistics. 2021. "U.S. Air Passenger Miles." https://www.bts.gov/content/us-passenger-miles. Accessed 11.23.21.

Burris, Val. 2005. "Interlocking Directorates and Political Cohesion among Corporate Elites." *American Journal of Sociology.* Vol. 111(1):249-283.

Campbell, John L. 1993. “The State and Fiscal Sociology.” *Annual Review of Sociology*. Vol. 19:163–85.

Carruthers, Bruce, and Naomi Lamoreaux. 2016. “Regulatory Races: The Effects of Jurisdictional Competition on Regulatory Standards.” *Journal of Economic Literature*. Vol. 54 (1): 52-97

Casselman, Ben and Ella Koeze. 2021. “The Pandemic Changed How We Spent Our Time.” *New York Times*, July 27. Retrieved March 22, 2022 (https://www.nytimes.com/interactive/2021/07/27/business/economy/covid-parenting-work-time.html).

Chase, Ivan. 1991. “Vacancy Chains.” *Annual Review of Sociology*. Vol. 17:133–54.

Chetty, Raj, Adam Looney, and Kory Kroft. 2009. “Salience and Taxation: Theory and Evidence.” *American Economic Review*. Vol 99 (4): 1145-77.

Chetty, Raj, John Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan. 2017. Mobility Report Cards: The Role of Colleges in Intergenerational Mobility. NBER WORKING PAPER NO. 23618.

Cohen, Roger, Andrew Lai and Charles Steindel. 2015. “A Replication of ‘Millionaire Migration and State Taxation of Top Incomes: Evidence from a Natural Experiment.’” *Public Finance Review*. Vol. 43:206–25.

Coleman, James. 1988. “Social Capital in the Creation of Human Capital.” *American Journal of Sociology*. Vol. 94: S95–120.

Collins, Randall. 2020. “Social distancing as a critical test of the micro-sociology of solidarity.” *American Journal of Cultural Sociology*. Vol. 8: 477–497.

Dahl, Michael S., and Olav Sorenson. 2010. “The Social Attachment to Place.” *Social Forces* 89(2):633–58.

Dahl, Michael S., and Olav Sorenson. 2012. “Home Sweet Home: Entrepreneurs’ Location Choices and the Performance of their Ventures.” *Management Science* 58(6):1059–71.

Diamond, Peter and Emmanuel Saez. 2011. “The Case for a Progressive Tax: From Basic Research to Policy Recommendations.” *Journal of Economic Perspectives*. Vol. 25(4):165–190.

Elliott, Anthony, and John Urry. 2010. *Mobile Lives*. Routledge.

Feenberg, Daniel, and Elisabeth Coutts. 1993. “An Introduction to the TAXSIM Model.” *Journal of Policy Analysis and Management.* Vol. 12(1):189-194.

Feldstein, Martin, and Marian Vaillant Wrobel. 1998. “Can State Taxes Redistribute Income?” *Journal of Public Economics.* Vol. 68(3):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.

Fischer, Claude S. 2002. “Ever-more Rooted Americans.” *City & Community.* Vol. 1(2):177-198.

Fligstein, Neil. 2008. *Euroclash: The EU, European identity, and the future of Europe*.

Glaeser, Edward. 2011. “Cities, Productivity, and Quality of Life.” *Science.* Vol. 333(6042):592-594.

Glaeser, Edward, David Laibson, and Bruce Sacerdote. 2002. “An Economic Approach to Social Capital.” *The Economic Journal*. Vol 112(483): F437-F458.

Granovetter, Mark. 1985. “Economic Action and Social Structure: The Problem of Embeddedness.” *American Journal of Sociology.* Vol. 91(3):481–510.

Grumbach, Jacob. 2018. “From Backwaters to Major Policymakers: Policy Polarization in the States, 1970–2014.” *Perspectives on Politics*. Vol. 16(2): 416-35.

Luigi Guiso, Paola Sapienza, Luigi Zingales. 2011. "Civic Capital as the Missing Link." Pp. 417-80 in Benhabib, Jess, Alberto Bisin, and Matthew Jackson (eds.). *Handbook of Social Economics*. North-Holland.

Hemel, Daniel. 2017. “Easy on the SALT: A Qualified Defense of the Deduction for State and Local Taxes.” *Coase-Sandor Working Paper Series in Law and Economics*. 830.

Harrington, Brooke. 2017. *Capital without Borders: Wealth Management and the One Percent*. Harvard University Press. 2017

Hochberg, Yael, Alexander Ljungqvist, and Yang Lu. 2007. “Whom You Know Matters: Venture Capital Networks and Investment Performance.” *The Journal of Finance.* Vol. 62(1):251-301.

JCT (Joint Committee on Taxation). 2019. *Background on the Itemized Deduction for State and Local Taxes*. June 24, 2019.

Kaplan, Greg, and Sam Schulhofer-Wohl. 2017. “Understanding the Long-run Decline in Interstate Migration.” *International Economic Review.* Vol. 58(1):57-94.

Keister, Lisa A. 2014. “The One Percent.” *Annual Review of Sociology.* Vol. 40:347-367.

Klemens, Ben. 2021. “An Analysis of US Domestic Migration via Subset-stable Measures of Administrative Data.” *Journal of Computational Social Science.* Vol. 1-32.

Kleven, Hendrik, Camille Landais, Mathilde Munoz, and Stephanie Stancheva. 2020. “Migration and Taxation: Evidence and Policy Implications.” *Journal of Economic Perspectives*. Vol. 34(2): 119-42.

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 and Esben Schultz. 2014. "Estimating Taxable Income Responses Using Danish Tax Reforms." *American Economic Journal: Economic Policy*. Vol. 6(4): 271–301.

Koşar, Gizem, Tyler Ransom, and Wilbert Van der Klaauw. 2021. “Understanding Migration Aversion Using Elicited Counterfactual Choice Probabilities.” *Journal of Econometrics*.

Kovacs, Balazs, Nicholas Caplan, Samuel Grob, and Marissa King. 2021. “Social Networks and Loneliness During the COVID-19 Pandemic.” *Socius*. Vol. 7:1-17.

Kuk, John, Ariela Schachter, Jacob William Faber, and Max Besbris. 2021. “The COVID-19 Pandemic and the Rental Market: Evidence from Craigslist.” *American Behavioral Scientist*. Vol. 65(12): 1623–48.

Laffer, Arthur and Stephen Moore. 2018. “So Long, California. Sayonara, New York: Blue states will lose millions of people in the years to come—and they aren’t ready.” *Wall Street Journal*. April 24.

Larrimore, Jeff, Jacob Mortenson, and David Splinter. (Forthcoming). “Household Incomes in Tax Data: Using Addresses to Move from Tax Unit to Household Income Distributions.” *Journal of Human Resources*.

Lurie, Ithai, and James Pearce. 2019. “Health Insurance Coverage from Administrative Tax Data.” U.S. Department of the Treasury. Office of Tax Analysis Working Paper 117.

Macaulay, Stewart. 1963. “Non-Contractual Relations in Business: A Preliminary Study.” *American Sociological Review.* Vol. 28(1):55–67.

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

Mathur, Aparna, Sita Slavov, and Michael Strain. 2012. "Should the Top Marginal Income Tax Rate Be 73 Percent?" *Tax Notes*. November: 905-15.

Miller, Kenneth. 2020. *Texas vs. California: A History of Their Struggle for the Future of America*. New York, NY: Oxford University Press.

Moretti, Enrico, and Daniel Wilson. 2019. “Taxing Billionaires: Estate Taxes and the Geographical Location of the Ultra-Wealthy.” Federal Reserve Bank of San Francisco Working Paper 2019-25.

Moretti, Enrico, and Daniel Wilson. 2017. “The Effect of State Taxes on the Geographical Location of Top Earners: Evidence from Star Scientists.” *American Economic Review*. Vol. 107 (7): 1858-1903.

Moretti, Enrico and Daniel Wilson . 2021. “Taxing Billionaires: Estate Taxes and the Geographical Location of the Ultra-Wealthy”, Working Paper, September 23.

Nee, Victor, and Lucas Drouhot. 2020. “Immigration, Opportunity, and Assimilation in a Technology Economy.” *Theory and Society*. Vol. 49(5):965-990.

Newman, Katherine S., and Rourke O’Brien. 2011. *Taxing the Poor*. Berkeley, CA: University of California Press.

NY State Governor's Press Office. 2019. “Governor Cuomo Announces Meeting with President Trump on the Devastating Impact of SALT.” February 11. https://www.governor.ny.gov/news/governor-cuomo-announces-meeting-president-trump-devastating-impact-salt

Page, Benjamin I., Larry M. Bartels, and Jason Seawright. 2013. “Democracy and the Policy Preferences of Wealthy Americans.” *Perspectives on Politics.* Vol. 11(1):51-73.

Parolin, Zachary, and Janet Gornick. 2021. “Pathways Toward Inclusive Income Growth: A Comparative Decomposition of National Growth Profiles.” *American Sociological Review.* Vol. 86(6):1131-1163.

Parolin, Zachary, and Emma Lee 2021. “Large socio-economic, geographic and demographic disparities exist in exposure to school closures.” *Nat Hum Behav* 5, 522–528.

Pichler, Florian, and Claire Wallace. 2009. “Social Capital and Social Class in Europe: The Role of Social Networks in Social Stratification.” *European Sociological Review.* Vol. 25(3):319-332.

Piketty, Thomas. 2014. *Capital in the 21st Century*. Cambridge Massachusetts: The Belknap Press of Harvard University Press.

Piketty, Thomas, and Emmanuel Saez. 2007. "How Progressive is the US 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." Pp. 391–474 in Handbook of Public Economics, Vol. 5, edited by A. Auerbach, R. Chetty, M. Feldstein, and E. Saez. Amsterdam: North Holland.

Piketty, Thomas, Emmanuel Saez, and Gabriel Zucman. 2016. "Distributional National Accounts: Methods and Estimates for the United States." NBER Working Paper No. 22945.

Piketty, Thomas, Emmanuel Saez, and Stefanie Stantcheva. 2014. "Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities." *American Economic Journal: Economic Policy.* Vol. 6(1):230-271.

Powell, Walter, Kelley Packalen and Kjersten Whittington. 2011. "Organizational and Institutional Genesis: The Emergence of High-Tech Clusters in the Life Sciences." Pp. 434-65 in Padgett, John and Walter Powell (eds). *The Emergence of Organizations and Markets*. Princeton University Press.

Prasad, Monica. 2018. *Starving the Beast: Ronald Reagan and the Tax Cut Revolution*. New York, NY: Russell Sage Foundation.

Putnam, Robert. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.

Rapier, Graham. 2020. "Elon Musk confirms he's moved to Texas after a months-long fight with California." *Business Insider*. Dec. 8. https://www.businessinsider.com/tesla-ceo-elon-musk-confirms-move-to-texas-2020-12

Rauh, Joshua and Ryan Shyu. 2019. "Behavioral Responses to State Income Taxation of High Earners: Evidence from California." NBER Working Paper 26349.

Reeves, Aaron, Sam Friedman, Charles Rahal, and Magne Flemmen. 2017. "The Decline and Persistence of the Old Boy: Private Schools and Elite Recruitment 1897 to 2016." *American Sociological Review*. Vol. 82(6): 1139–66.

Saez, Emmanuel, Joel Slemrod, and Seth H. 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.

Santos Silva, J.M.C. and Silvana Tenreyro. 2006. "The Log of Gravity." *Review of Economics and Statistics*. Vol. 88(4): 641-658.

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

Slemrod, Joel. 2001. "A General Model of the Behavioral Response to Taxation." *International Tax and Public Finance*. Vol. 8(2):119-128.

Slemrod, Joel (ed.). 2002. *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*. Cambridge: Harvard University Press.

Small, Mario L., and Laura Adler. 2019. "The Role of Space in the Formation of Social Ties." *Annual Review of Sociology*. Vol. 45:111-132.

Sorenson, Olav. 2017. "Regional Ecologies of Entrepreneurship." *Journal of Economic Geography*. Vol. 17(5):959-974.

Varner, Charles, Cristobal Young, and Allen Prohofsky. 2018. "Millionaire Migration in California: Administrative Data for Three Waves of Tax Reform." Stanford Center on Poverty and Inequality Working Paper.

Walczak, Jared. 2017. "The State and Local Tax Deduction: A Primer." *Tax Foundation, March* 15.

White, Harrison. 1970. *Chains of Opportunity: System Models of Mobility in Organizations*. Harvard UP.

Williams, Stephen. 2018. "Cuomo: Feds Have Shot an Arrow Aimed at New York's Economic Heart."" Daily Gazette. January 3.

Winters, Jeffrey A. 2011. *Oligarchy*. New York, NY: Cambridge University Press.

Yamamura, Kevin. 2011. "Plans to 'Tax the Rich' Hold Risks and Rewards for California." Sacramento Bee, December 27. Retrieved July 26, 2014.

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, Charles Varner, Ithai Lurie, and Richard Prisinzano. 2016. "Millionaire Migration and the Taxation of the Elite: Evidence from Administrative Data." *American Sociological Review*. Vol. 81(3):421-446.

Young, Cristobal. 2017. *The Myth of Millionaire Tax Flight: How Place Still Matters for the Rich*. Stanford University Press.

Young, Cristobal, and Katherine Holsteen. 2017. "Model Uncertainty and Robustness: A Computational Framework for Multi-Model Analysis." *Sociological Methods and Research*. Vol. 46(1): 3-40.

Zidar, Owen. 2019. "Tax Cuts for Whom? Heterogeneous Effects of Tax Changes on Growth and Employment". *Journal of Political Economy*. 127(3):1437-1472. doi: 10.3386/w21035.

Zucman, Gabriel. 2015. *The Hidden Wealth of Nations. The Scourge of Tax Havens*. Chicago, IL: The University of Chicago Press.

Table 1: Probability of Migration, 2015-2019

	$1 million+		$500k-1M	$200-500k	$100-200k
Tax rate relative to FL	**0.051**	**0.019**	**0.040**	**0.054**	**0.087**
	(0.063)	(0.068)	(0.056)	(0.062)	(0.047)
Tax change relative to FL	**-0.008**	**0.019**	**-0.017**	**0.105**	**-0.000**
	(0.065)	(0.067)	(0.077)	(0.146)	(0.115)
Economic embeddedness					
"Capitalist"		**0.668*** **	**0.790*** **	**0.866*** **	**0.885* **
		(0.035)	(0.125)	(0.119)	(0.341)
Business owner		**-1.521*** **	**-1.376*** **	**-0.943*** **	**-0.357*** **
		(0.246)	(0.144)	(0.079)	(0.056)
Social embeddedness					
Married		**-0.742*** **	**-0.545*** **	**-0.381** **	**-0.404* **
		(0.165)	(0.163)	(0.136)	(0.192)
Dual earner family		**-0.816*** **	**-0.641*** **	**-0.875*** **	**-1.270*** **
		(0.050)	(0.074)	(0.054)	(0.107)
Children at home		**-1.858*** **	**-1.552*** **	**-1.555*** **	**-1.379*** **
		(0.150)	(0.145)	(0.166)	(0.100)
Homeowner		**-0.232**	**-0.640*** **	**-1.344*** **	**-1.495*** **
		(0.162)	(0.143)	(0.162)	(0.137)
Age (centered at 50)		**-0.071*** **	**-0.071*** **	**-0.096*** **	**-0.103*** **
		(0.005)	(0.007)	(0.010)	(0.009)
Constant	**2.407*** **	**5.558*** **	**5.095*** **	**5.195*** **	**4.507*** **
	(0.217)	(0.308)	(0.237)	(0.354)	(0.379)
Observations	**1,354,099**	**1,354,099**	**1,352,578**	**1,706,907**	**1,690,654**
R^2	**0.000**	**0.005**	**0.006**	**0.008**	**0.011**

***p<0.001, **p<0.01, *p<0.05. Linear probability model. Outcome variable is migration status, scaled as 100 (migrant) or 0 (non-migrant) so that coefficients can be interpreted as percentage point changes. Robust standard errors in parentheses.

Table 2: Gravity models of millionaire migration, 2015-2019

	1	2	3
Average tax difference	-0.077***	-0.069**	-0.068**
	(0.022)	(0.022)	(0.022)
Difference in difference			-0.052***
			(0.015)
Log population, origin	0.867***	0.960***	0.959***
	(0.060)	(0.065)	(0.065)
Log population, destination	1.002***	0.918***	0.918***
	(0.052)	(0.049)	(0.049)
Log distance	-0.392***	-0.389***	-0.389***
	(0.054)	(0.047)	(0.047)
Contiguity	0.652***	0.717***	0.718***
	(0.093)	(0.128)	(0.128)
Winter temperature / 10		0.107	0.110
		(0.069)	(0.069)
July humidity		0.002	0.002
		(0.003)	(0.003)
Sales tax difference		-0.005	-0.006
		(0.016)	(0.016)
Property tax difference		-0.169*	-0.170*
		(0.081)	(0.081)
Unemployment rate		-0.072	-0.074
		(0.049)	(0.048)
Average income / 1000		-0.012	-0.011
		(0.009)	(0.009)
Log of land value		0.175	0.168
		(0.092)	(0.090)
Constant	-14.622***	-14.760***	-14.753***
	(0.572)	(0.494)	(0.493)
N (state pairs)	10,200	10,200	10,200
N (migrations)	48,737	48,737	48,737

Robust standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05

Table 3: Probability of migration models, filing years 2019 and 2020

Millionaires; excluding returns filed before mid-March

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	W2s (pre-COVID)	1040s (COVID)	W2s (pre-COVID)	1040s (COVID)	W2s (pre-COVID)	1040s (COVID)	1040s (COVID) within state
Year 2020	-0.008	0.471**	-0.081	-0.027	-0.207	-1.286*	-1.501*
	(0.037)	(0.152)	(0.046)	(0.112)	(0.155)	(0.527)	(0.717)
Relative tax rate			0.012	0.007	0.001	-0.006	-0.005
			(0.056)	(0.055)	(0.047)	(0.046)	(0.021)
Relative tax rate X 2020			0.014	0.093*	0.008	0.047***	0.016
			(0.010)	(0.038)	(0.010)	(0.009)	(0.023)
Log population density					-0.067	-0.058	-0.019
					(0.071)	(0.055)	(0.041)
Log population density X 2020					0.017	0.186*	0.250*
					(0.027)	(0.081)	(0.107)
COVID Rate					0.004	0.004	0.000
					(0.003)	(0.002)	(0.001)
COVID Rate X 2020					0.001	0.002**	0.000
					(0.000)	(0.001)	(0.001)
"Capitalist"			0.683***	0.357***	0.712***	0.414***	0.398***
			(0.062)	(0.068)	(0.060)	(0.065)	(0.105)
Business owner			-1.441***	-1.463***	-1.442***	-1.443***	-0.326***
			(0.252)	(0.198)	(0.246)	(0.184)	(0.084)
Married			-0.799***	-1.359***	-0.816***	-1.359***	-1.046***
			(0.180)	(0.294)	(0.173)	(0.282)	(0.068)
Dual earner household			-0.713***	-0.590***	-0.693***	-0.550***	0.020
			(0.065)	(0.047)	(0.070)	(0.042)	(0.057)
Children at home			-1.994***	-1.888***	-2.019***	-1.934***	-1.112***
			(0.157)	(0.209)	(0.161)	(0.215)	(0.090)
Homeowner			-0.093	0.167	-0.110	0.111	-0.242*
			(0.141)	(0.143)	(0.149)	(0.158)	(0.091)
Age (centered at 50)			-0.069***	-0.052***	-0.070***	-0.051***	-0.049***
			(0.005)	(0.007)	(0.005)	(0.006)	(0.005)
Constant	2.679***	3.096***	5.559***	6.288***	5.857***	6.512***	4.396***
	(0.177)	(0.249)	(0.320)	(0.409)	(0.451)	(0.469)	(0.450)
Observations	971,941	959,817	971,941	959,817	971,941	959,817	933,740
R-squared	0.000	0.000	0.005	0.006	0.006	0.007	0.004

Robust standard errors in parentheses. Models for 1040 returns include the number of weeks since the previous filing; this variable is not needed for the W2s, as filing times are standard.

*** p<0.001, ** p<0.01, * p<0.05

Appendix I. Probability of Migration, in Year t+2

Here we show analysis of the probability of migration between years t and $t+2$ to capture a possible lag in the migration response. While baseline migration rates are naturally higher at year $t+2$ than for year $t+1$ (as shown by the intercepts), the model coefficients are not noticeably changed. For the DiD estimates, this means that even in the second year of the TCJA, we do not observe significant effects in the probability of migration.

Table A1: Probability of Migration (2-Year Lag), 2015-2019

	$1 million+		$500k-1M	$200-500k	$100-200k
Tax rate relative to FL	**0.112**	**0.055**	**0.081**	**0.104**	**0.149**
	(0.113)	(0.121)	(0.100)	(0.102)	(0.077)
Tax change relative to FL	**-0.009**	**0.042**	**0.040**	**0.166**	**0.040**
	(0.140)	(0.146)	(0.168)	(0.261)	(0.190)
Economic embeddedness					
"Capitalist"		**0.869****	**0.807*****	**0.967*****	**1.281*****
		(0.255)	(0.203)	(0.120)	(0.361)
Business owner		**-2.908*****	**-2.580*****	**-1.701*****	**-0.668*****
		(0.435)	(0.272)	(0.137)	(0.082)
Social embeddedness					
Married		**-0.680*****	**-0.551*****	**-0.373**	**-0.479**
		(0.181)	(0.217)	(0.241)	(0.283)
Dual earner family		**-1.450*****	**-1.052*****	**-1.414*****	**-2.081*****
		(0.092)	(0.106)	(0.092)	(0.170)
Children at home		**-3.165*****	**-2.741*****	**-2.721*****	**-2.320*****
		(0.284)	(0.239)	(0.249)	(0.156)
Homeowner		**-0.099**	**-0.779****	**-1.798*****	**-2.069*****
		(0.238)	(0.240)	(0.294)	(0.218)
Age (centered at 50)		**-0.115*****	**-0.115*****	**-0.156*****	**-0.166*****
		(0.007)	(0.009)	(0.016)	(0.014)
Constant	**4.020*****	**8.932*****	**8.327*****	**8.341*****	**7.248*****
	(0.396)	(0.531)	(0.373)	(0.568)	(0.589)
Observations	**1,736,455**	**1,736,455**	**1,726,633**	**2,167,373**	**2,167,671**
R^2	**0.000**	**0.009**	**0.009**	**0.011**	**0.016**

***p<0.001, **p<0.01, *p<0.05. OLS regression. Robust standard errors in parentheses. Outcome variable is migration status, scaled as 100 (migrant) or 0 (non-migrant).

Appendix II: Gravity Models of Migration, with 2-year lag

Here we show analysis of the analysis of all millionaire migration flows over years t and $t + 2$ to capture a possible lag in the migration response. The effect of average tax differences between states is much the same in the main analysis. The D.i.D. estimates for the tax reform is slightly smaller, suggesting that the second-year effect was smaller than the immediate response.

Table A2: Gravity models of millionaire migration (2-year lag), 2015-2020

	Model 1	Model 2	Model 3
Average tax difference	**-0.086*** **	**-0.077*** **	**-0.076*** **
	(0.019)	(0.020)	(0.020)
Difference in difference			**-0.035***
			(0.014)
Log population, origin	**0.842*** **	**0.951*** **	**0.949*** **
	(0.055)	(0.062)	(0.062)
Log population, destination	**0.981*** **	**0.885*** **	**0.885*** **
	(0.051)	(0.047)	(0.047)
Log distance	**-0.402*** **	**-0.402*** **	**-0.401*** **
	(0.056)	(0.048)	(0.048)
Contiguity	**0.620*** **	**0.703*** **	**0.704*** **
	(0.089)	(0.120)	(0.119)
Winter temperature / 10		**0.133***	**0.135***
		(0.067)	(0.067)
July humidity		**0.002**	**0.002**
		(0.003)	(0.003)
Sales tax difference		**-0.006**	**-0.007**
		(0.016)	(0.016)
Property tax difference		**-0.180***	**-0.182***
		(0.079)	(0.079)
Unemployment rate		**-0.064**	**-0.069**
		(0.040)	(0.040)
Average income / 1000		**-0.016**	**-0.015**
		(0.009)	(0.009)
Log of land value		**0.210***	**0.203***
		(0.086)	(0.085)
Constant	**-13.688*** **	**-13.887*** **	**-13.879*** **
	(0.586)	(0.492)	(0.491)
N (state pairs)	10,200	10,200	10,200
N (migrations)	77,587	77,587	77,587

Robust standard errors in parentheses.
*** p<0.001, ** p<0.01, * p<0.05

Appendix III: Heterogeneity Analysis

Here, we provide detailed heterogeneity results from the gravity model of migration (Table 2 of the main paper). Specifically, we estimate the Table 2, Model 3 specification across many different subsets of the millionaire population. In the first row of Table A3, we show results for those making $5 million or more in annual income. The migration effect of average tax differences in this bracket is similar to millionaires overall (second row); however, the DiD estimate for the effect of the TCJA is smaller and not statistically significant. The remainder of the table provides group-specific estimates 16 different subsets of the millionaire population, as well as three tranches of lower-income ‘control groups’ that were less affected by the tax changes. The overall results do not suggest systematic patterns of heterogeneity in the elite population. The average tax difference estimate is typically close to the main estimate (repeated here in row 2: -0.068), which increases confidence in this result (Athey and Imbens 2015). For the DiD estimates, they are typically much smaller than the main estimate, and frequently take opposite signs. While the standard errors are mostly larger for the DiD estimates (indicating less precise estimates), what is most noteworthy is the small and unstable DiD estimates in heterogeneity testing.

Table A3: Heterogeneity Analysis

	Average tax difference	SE	Difference from average	SE	Number of migrations (4 years)	Mean abs. tax difference	Mean abs. diff. from average
Treatment group							
$5 million and over	-0.057**	(0.021)	-0.021	(0.022)	6,214	3.12	0.93
$1 million and over	-0.068**	(0.022)	-0.052***	(0.015)	48,783	2.80	0.58
$500k to $1 million	-0.061*	(0.029)	0.026	(0.087)	45,576	2.49	0.42
Control group							
$200 to $500k	-0.059*	(0.030)	-0.020	(0.046)	59,893	2.18	0.32
$100 to $200k	-0.066	(0.040)	0.016	(0.023)	53,380	1.88	0.29
$10 to $100k	-0.008	(0.032)	0.016	(0.027)	46,994	1.95	0.21
Economic Status (Millionaires)							
Capital gains 75%+	-0.054*	(0.024)	-0.033	(0.072)	6,392	3.08	0.36
Capital gains <75%	-0.068***	(0.020)	-0.040**	(0.014)	42,389	2.67	0.62
Business owner	-0.068*	(0.028)	-0.008	(0.082)	34,580	2.82	0.60
Non-business owner	-0.068**	(0.025)	-0.011	(0.043)	14,201	3.01	0.65
Family Status (Millionaires)							
Married	-0.070**	(0.022)	-0.023	(0.071)	36,898	2.81	0.59
Not married	-0.056	(0.032)	0.007	(0.017)	11,883	2.78	0.63
Children at home	-0.035	(0.022)	0.003	(0.063)	12,803	2.80	0.65
No children at home	-0.082**	(0.030)	-0.034**	(0.012)	35,978	2.75	0.56
Homeowner	-0.087**	(0.031)	0.040	(0.075)	33,038	3.00	0.58
Not a homeowner	-0.048	(0.024)	-0.048	(0.049)	15,743	2.53	0.66
Dual earner household	-0.071***	(0.021)	-0.049	(0.037)	3,728	2.72	0.69
Single-earner, married	-0.076**	(0.029)	-0.002	(0.030)	33,170	2.84	0.60
Retirement Age (Millionaires)							
Age 65+	-0.075	(0.042)	-0.035	(0.018)	11,130	2.63	0.55
Under 65	-0.060*	(0.025)	0.021	(0.077)	37,651	2.82	0.62
No Florida (Millionaires)	-0.036	(0.023)	-0.042*	(0.020)	35,076	4.41	0.60
Average	-0.061	(0.027)	-0.014	(0.043)	29,785	2.77	0.56

Robust standard errors clustered by state are in parentheses. ***p<0.001, **p<0.01, *p<0.05. Estimates are from income tax rate coefficients from migration models, run separately for each group. The outcome variables represent counts of migration flows between each state pair.

Appendix IV. Computing Elasticities: Migration and Revenue Estimates for a Unit Change in Millionaire Tax

This appendix documents the estimation of the migration and income-tax revenue consequences of a 1% change in the millionaire tax for states. The tax change we model is equal to one percent of annual income on those earning $1 million or more in annual income. Based on the parameter estimates in gravity model 2 (Table 2), we estimate the consequences of the tax increase in the following way:

1. Predict in- and out-migrations for each state using actual tax rates.
2. Predict *counterfactual* migrations after raising the tax rate in each state – one state at a time – by one percentage point.
3. The loss of millionaire households due to the tax is estimated by the comparison between the predicted migrations under the actual tax rate and the *counterfactual* tax rate; this includes both extra out-migration from the state, and lower in-migration to the state, due to the tax increase.
4. The revenue cost is calculated as how much revenue migrants *would have paid* in income tax at the new rate had they *not* moved to a different state. For each state, this is computed from (1) the number of millionaires lost; (2) the average income of millionaires in each state, and (3) the new state tax rate. Specifically for state *i*: $Revenue\ loss = (migration\ loss_i) * (average\ income\ of\ millionaires_i) * (effective\ tax\ rate\ on\ millionaires_i)$.
5. The revenue gain from raising the tax rate is estimated simply by the number of millionaires who remain in the state. Each non-migrating millionaire contributes an extra one percent of their annual income in tax revenues. The aggregate of this is the overall revenue gain. This is an estimate of the mechanical effect of the tax, and does not take into account efforts by non-migrating millionaires to reduce or conceal their taxable income in response to the higher tax rate (Saez, Slemrod, and Giertz 2012).

Appendix V: Gravity Models for COVID

In Table A4, we show the gravity model effect of interstate tax differences for movers. While the magnitude of this tax effect fluctuates slightly over time and between the W2 and 1040 data sets, the final column – showing the influence of taxes on migration destinations during the pandemic – does not show any larger effects. There were more millionaire migrants overall during the pandemic, but they moved to the same types of places as movers in previous years.

Table A4: Gravity models of millionaire migration, by filing year

	2017		2018		2019		2020	
	W2s	1040s	W2s	1040s	W2s	1040s	W2s	1040s
Average tax difference	**-0.064****	**-0.045***	**-0.057****	**-0.067****	**-0.077****	**-0.072****	**-0.076****	**-0.066****
	(0.021)	(0.020)	(0.021)	(0.023)	(0.024)	(0.027)	(0.024)	(0.024)
N (migrations)	11,225	12,071	11,001	10,755	13,103	12,107	13,454	14,630
N (state pairs)	2,550	2,550	2,550	2,550	2,550	2,550	2,550	2,550

Robust standard errors in parentheses. All models include the same covariate set as Table 2.
*** p<0.001, ** p<0.01, * p<0.05