Taxing the Rich:

How Shocks to Incentives and Embeddedness Shape Millionaire Tax Flight[1]

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Abstract:

Top income earners often face incentives to move to lower tax places, but at the same time may be rooted in the communities where they become successful. High tax places rely on elite embeddedness to retain their wealthy taxpayers and the revenues they bring. Low tax places hope that financial incentives will lure the rich away. This study explores how the intersection of incentives and embeddedness affects the mobility of elites. Using big administrative data, we examine two large-scale natural experiments: the 2017 federal tax reform, which changed incentives to favor lower-tax states; and the COVID-19 pandemic, which disrupted social ties to place. We show that both these events led to millionaire tax flight. However, the effects are small and demonstrate that, at least in the short run, embeddedness remains a powerful force that helps sustain the viability of taxes on the rich.

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Millionaire tax flight is a prominent debate 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 2019; Slemrod 2000). U.S. states offer varieties of taxation for top earners, and elites can choose their preferred tax rate if they are willing to move. Moreover, the income growth of the "one percent" means that the rich increasingly pay an outsized portion of income 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). As the rich are often seen as mobile, a key question is whether high-tax states can retain their wealthy residents and the revenues they bring.

The viability of progressive taxation depends, at least in part, on the embeddedness of top earners in places where they find their fortunes (Young 2017). Are the rich "mobile millionaires" who are readily drawn to places with lower tax rates? Or are they an "embedded elite" attached to place by broad socio-economic ties related to their success? Highly-mobile elites represent a challenge to the idea that state policies can intervene in the market distribution of income (Feldstein and Wroble 1994). In the face of migration pressures, how much policy autonomy do places have to tax the rich without risking the loss of their own tax base?

Supply-side economics has long argued that taxes on the rich cause avoidance behavior and diminish the incentive to work, invest, and innovate (Prasad 2018; Slemrod 2002; Allen and Campbell 1994; Piketty, Saez, and Stantcheva 2014). In many places today, however, the largest concerns about tax avoidance center on elite tax flight. Why would rich people continue to live in New York, New Jersey, or California when they could save a large portion of their annual income in taxes by moving to places like Florida or Texas[2]? This question has become central in the growing red state / blue state rivalry in the U.S. (Miller 2020). If top taxpayers are highly mobile, there is likely to be large unintended costs of progressive taxation, and taxing the rich will be a challenge for governments around the world.

Sociological views, in contrast, emphasize the embeddedness of millionaires and the non-pecuniary cost of migration. Migration is costly when it means a loss of socio-economic embeddedness. Millionaires often have multiplex socio-economic ties that grow around the places where they become successful during the course of their careers. Many top income-

[2] In this paper we consider only migration within the US and do not estimate migration abroad.

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). Elites may be mobile in principle but often their social capital is not; social, professional, and business networks are not individual property that readily 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.

We draw on two large-scale natural experiments to understand how incentives and 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 tax bill, known as the "Tax Cuts and Jobs Act" (TCJA)[3]. 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 commentators – 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 for. Have the new tax incentives set off a wave of top earner migration from high-tax to low-tax states? Or does place have durable attachment for elites even when new tax 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 embeddedness to place-based tax policies?

We draw on special access to big administrative data from IRS tax returns, employing data on all top income earners in the country, showing their state of residence and migration patterns before and after the TCJA, and during the COVID-19 pandemic. The data includes

[3] The cap on SALT deduction expires under TCJA in 2026 which might affect migration incentives as well.

roughly 450,000 households per year with million-dollar incomes, as well as random samples of households across the spectrum, providing nearly 12 million observations in total. We implement 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 aim to alleviate income disparities. Second, we contribute to economic sociology by vividly testing the importance of embeddedness in economic life. 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 despite major tax reform that increased the incentive to reside in a low-tax state, millionaires appeared strongly embedded and showed limited (but non-zero) sensitivity to tax migration incentives. We also find, by the same dynamic, that when embeddedness is weakened by a large external disruption, tax migration increases, causing revenue losses in places with more progressive taxes on the rich.

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 extensive 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 comfort (Elliot and Urry 2010; Harrington 2017). And while transaction costs of moving – such as the expense of buying and selling a home – are significant barriers for many, top earners can presumably finance the costs of any beneficial relocation. Thus, the rich seem motivated and mobile: highly sensitive to taxation and readily capable of exit. If true, 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 (Fligstien 2008; Piketty 2014).

Yet, there are multiple problems with this portrayal. First, much tax avoidance is legal maneuvering rather than real changes in behavior or lifestyle (Slemrod 2001). The main thing rich people do to avoid taxes is hire accountants, lawyers and wealth managers (Harrington 2017). Some types of avoidance are highly profitable for the rich, but it is not clear that migration is one of them. Second, actual tax-flight migration occurs at the intersection of incentives and embeddedness. Perceptions of elite mobility are mostly related to top-earners' frequency of travel for business and leisure, rather than their migration. Mobility-as-travel has increased steadily in 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.[4] 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 2012; 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 2020). When people migrate, "the social relations that constitute social capital are broken at each move" (Coleman 1988:S113). As Dahl and Sorenson write, "social capital depreciates as one transports it from the regions in which it had been developed" (2012:1061).

The distribution of social capital is highly unequal – with Gini coefficients at least as large as those for income – and strongly skewed towards the rich (Young et al 2021). Top earners often have more valuable social capital, tend to work in sectors, occupations, and positions that are more densely networked and experience high returns to interpersonal

[4] 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.

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). 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; Glaeser 2011; Saxenian 1994; Nee and Drouhot 2020). Studies of the rich report high rates of civic participation, frequent co-membership on corporate boards or 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).[5] In short, social capital and intensive networking appear as a key part of the success of top income earners, suggesting high non-pecuniary costs from migration.

In survey research, more Americans describe themselves as "rooted" than "mobile" (52 versus 36 percent) (Kosar et al 2021; Fischer 2002). The third group – those who see themselves as "stuck" – have much lower incomes. This is an important distinction: the rich are not stuck – as some poor households are – but they are very often rooted and not motivated to relocate. When asked what level of financial incentive could make them consider moving, even "mobile" would need a 35 percent increase in their annual income (in perpetuity) to see moving as worthwhile (Kosar et al 2021:4; see also Riley 2021). The largest income tax differences between states today, even after the TCJA reform, represent about 10 percent of annual income – far less than what the mobile say would justify a move.

The 2017 Tax Reform: A Salient Natural Experiment

As more states come to have one-party political control, there is growing geographic policy divergence in the U.S. (Miller 2020). Tax policy is a key 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.

[5] 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).

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 (Hammel 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 top earners, the TCJA cut taxes in low-tax states, and raised taxes in high-tax states. The bill created the largest rise in tax differences between states since at least 1979 – as far back as we can accurately calculate (Appendix 1).

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).

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 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 arrived 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 high premium for residential stability. In the first wave of the pandemic, time spent at work fell by 50 percent nationwide,[6] and the number of people swiping into office buildings in major cities fell by almost 90 percent.[7] There was a near-total closure of K-12 schools for the remaining school year, which was a tremendous strain for parents but also removed a major constraint on their mobility. Time spent alone increased, and time with non-household friends and family dropped sharply (NYT). 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. 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).[8]

If economic action is embedded in "ongoing structures of social relations" that shape and constrain market behavior, this rootedness provides a layer of insulation from market incentives and pressures (Granovetter 1985:481; Macaulay 1963). Embeddedness insulates households from incentives, and reduces their responsiveness to market pressures. By the same logic, pandemic disruptions should make underlying incentives more resonant and influential. Those who normally feel rooted in a high-tax community faced a strong reason to revisit their attachments to place.

Given the importance of embeddedness for place-based taxation, to what extent did the pandemic set off a new wave of 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. How did COVID-19 impact elite migration? Did it set off a new wave of migration to low-tax states?

Evidence of Embeddedness and Tax Incentives in Migration

The social science literature on tax-flight migration is growing rapidly 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 2019), 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

[6] Chetty et al (2021), data available at https://www.tracktherecovery.org/.
[7] 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/.
[8] It seems clear many people were seeking to decouple their home location from their work location.

portion of millionaire migrations come with a net tax advantage. Examining a series of specific-state millionaire 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 a small but prominent group of the super-rich (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 much more 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 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 to examine how tax reform influenced elite migration. We focus on tax returns filed during 2016-2020 (for tax years 2015-2019), providing two full years before and after the TCJA, as well as the first year of the pandemic.[9] Our data include all federal income tax filers with income above $1 million, and random samples of filers with lower income.[10] 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 2018) 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).[11] These forms, which we call the W-2s for simplicity, are consistently issued in 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.[12] In supplementary analyses, we additionally use the addresses on the 1040 returns which are filed later for robustness testing and to estimate short run 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

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[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] 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.

[11] 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 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.

[12] 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.

households 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 individual tax return using the 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)[13]. 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-earner family status, as well as features at the state level, such as average incomes, residential land values, and including 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 tax reform.

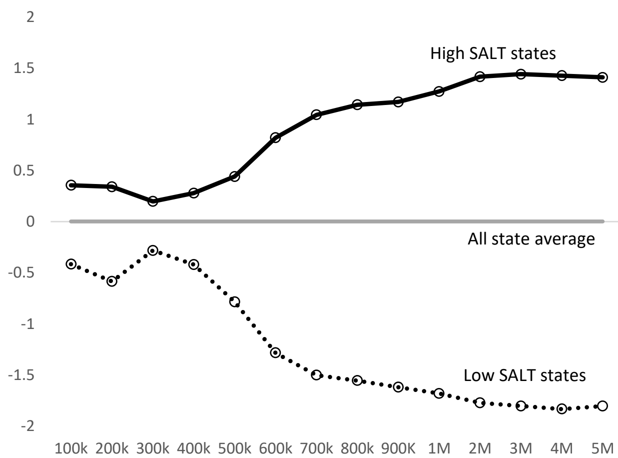
[13] We are using a version of TAXSIM that resides on the IRS servers. Hence, no taxpayers' data moved from the IRS servers.

How the TCJA changed relative tax rates

To illustrate how the TCJA affected tax rates in different states, we first define 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. Mostly, these states are representative of the "red state-blue state" rivalry in U.S. politics (Miller 2020). Figure 1 shows how the TCJA changed effective tax rates relative to the mean in low- and high-tax states – by detailed earnings levels. Capping the SALT deduction effectively redistributed income from millionaires in high-SALT states to those in low-SALT states. At incomes of $200k and above, 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. In appendix I, we show that the reform generated the largest change in interstate tax differences in at least 35 years.

Figure 1: the TCJA Tax Reform

Change in Effective Tax Rates, by Income and State Group

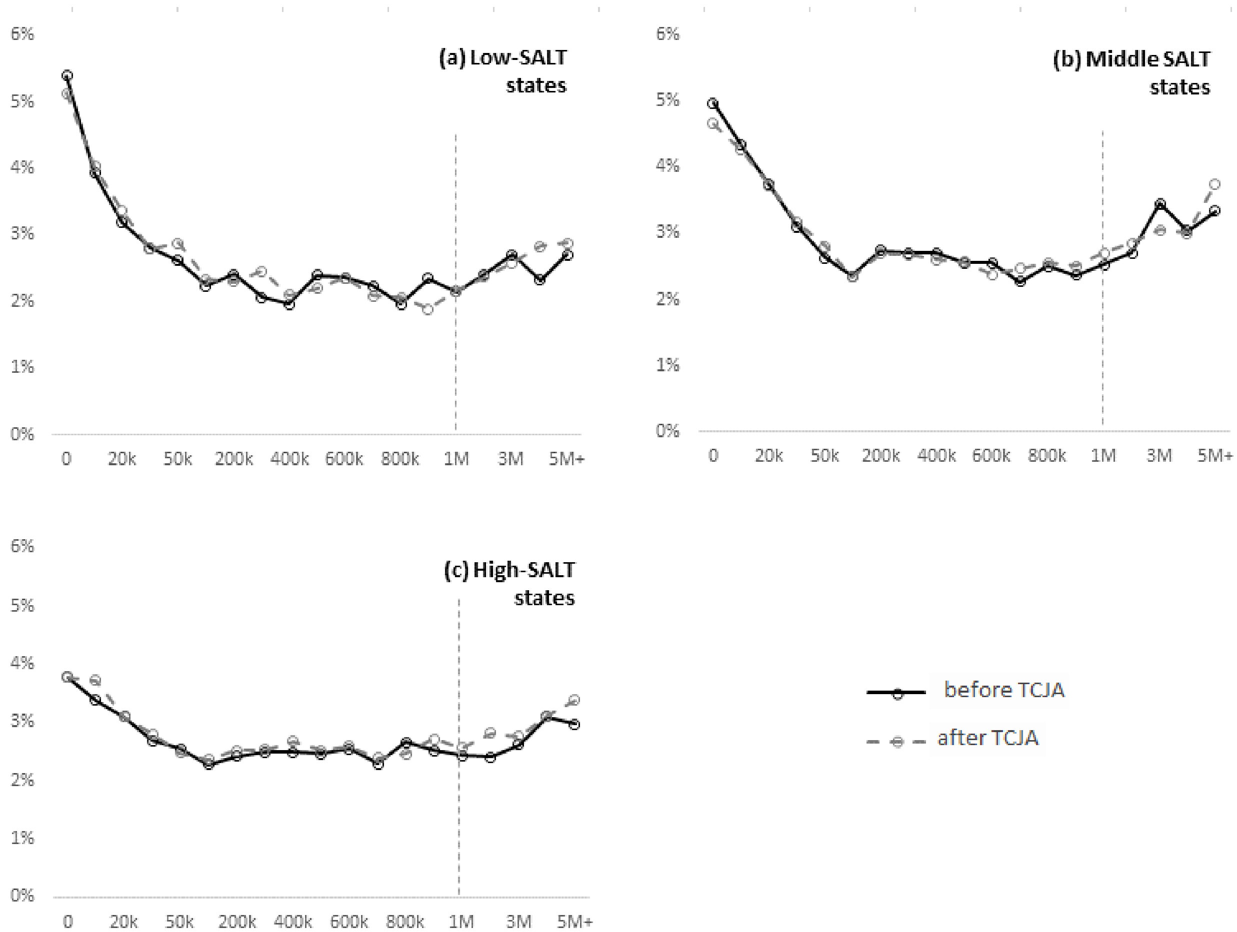


Note: High SALT states are California, New York, New Jersey, Connecticut, Oregon, District of Columbia, and Minnesota. Low SALT states are Florida, Texas, Tennessee, New Hampshire, Nevada, South Dakota, Washington, and Wyoming. Tax rates represent combined federal, state, and local income tax liability divided by total income.

Probability of Migration Analysis

What makes people mobile? Do state tax rates, and state tax changes, 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 migration-income 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 experience 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 inaccurate.

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 change in that difference occurring in year $t+1$. This tests the hypothesis 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. 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), homeownership 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.

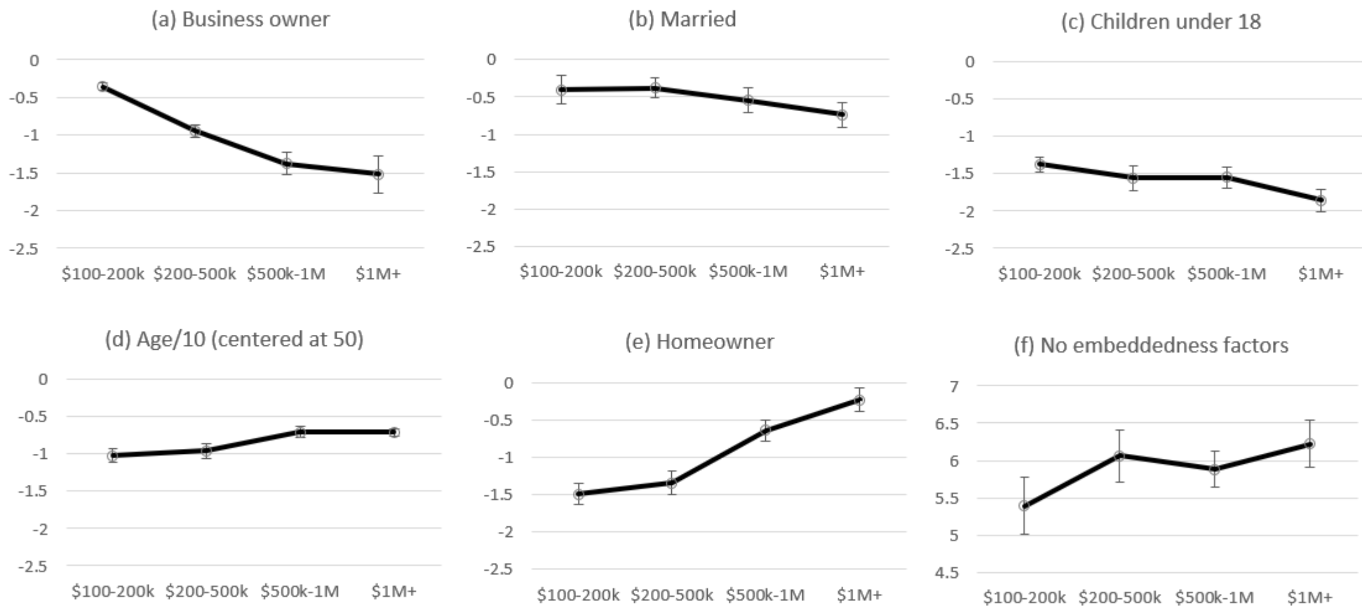
Model 2 incorporates the economic and social characteristics of households, most of which have substantial effects on migration, but do not notably change the tax coefficients. Models 3 – 5 run the same specification on income groups that faced consecutively smaller treatment under the TCJA: those making $500k-1M, $200k-500k, and $100k-200k. No tax effects are observed for any income group. In Appendix II, 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

	$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. OLS regression. Robust standard errors in parentheses. Outcome variable is migration status, scaled as 100 (migrant) or 0 (non-migrant).

Figure 4. 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 4 shows how embeddedness factors have differing force by income level. The top row of panels (a - c) shows three conditions in which embeddedness factors are stronger for millionaires than for lower income earners. Business ownership is a good example. When individuals own a business, they are less likely to move to a different state whether they make $100k or $1 million. But the richer a business owner is, the lower their migration rate. At $100k business owners have 0.5pp lower migration; at $1M, business owners have 1.7pp lower migration. Elite business owners are much more tied to place than upper-middle class business owners – perhaps because their businesses are more successful or involve more non-replaceable socio-economic ties among customers, employees, and co-owners. Marriage follows a similar pattern as business ownership: married tax filers have strong ties to place, and place-attachment grows with income. Among married households, millionaires are less mobile than the middle class. Parental status also serves to ground people in place and lower their residential mobility. The ties of family are especially binding for the richest households. It should be noted as well that these conditions are very common among millionaires: in particular, more than 80 percent are married; a similar share own a business. Overall, this suggests that social ties often lead top-earners to purchase greater residential stability.

In contrast, the lower row of panels in Figure 4 (d - f) show conditions that are less embedding for millionaires. Age illustrates this pattern well: migration rates decline with age for all these income groups, but less so for millionaires, who are modestly more likely than others to migrate later in life. For every 10 years of age over 50, millionaires are 0.7 pp less likely to migrate across states, compared to 1.0 pp less likely for the upper middle-class. Homeownership is also less embedding for millionaires, and the difference is strong. For most higher-income earners, homeownership sharply reduces the chances of moving (-1.5 pp for those with $100k), but not for millionaires – where the effect of homeownership is close to zero (-0.2 pp). The final panel (f) shows expected migration rates by income for those with no embeddedness factors: those who make most of their money from capital rather than employment, are relatively young for their income bracket (age 50), do not own a business or a home, are not married and have no school-age children. For such unattached individuals, residential mobility rises with income. This fits clearly with the mobile millionaire hypothesis; however, few top income earners are unattached individuals.

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 some insight into aspects of top earners' lives that ground them in place.

Interstate Millionaire Migration: 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 51x50 matrix of flows between every possible pairing of states, including the District of Columbia. 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 $\{i, j\}$ 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 change in millionaire population for each percentage point change in tax.

Results

Table 2 shows regression results. Model 1 reports coefficients from the core gravity variables and the cross-state tax difference. The populations of the origin and destination states show close to unit elasticities: a 1 percent higher millionaire population leads to about 0.9 to 1.0 percent higher migration flows. As the distance between states grows, migration flows are less frequent, so that a 1 percent increase in distance reduces migration flows by .32 percent. Contiguity has a very strong effect: states with shared borders have especially high millionaire migration volumes between them.[14] The interstate tax difference has a significant impact on millionaire flows, with a semi-elasticity of −.077. Migration tends to flow from high-tax to low-tax states, and migrations flows are larger when the tax advantage is larger. Model 2 incorporates a basic set of state level controls, addressing winter climate, alternative tax instruments (sales and property tax rates), states' economic strength (unemployment rate and per capita income), and the price of residential land. These variables have little impact on the baseline tax migration estimate: the effect of the top tax rate is nominally smaller (−.069). 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 interstate tax difference.

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?

[14] Note that in log-linear models, the coefficients of dummy variables need to be exponentiated for interpretation. In Model 1, contiguity raises migration flows by 105 percent = 100 × [exp(.72) − 1].

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

Implied Population Elasticities

The effect of taxes on millionaire migration has been expressed in two different ways: (a) change in the *flow* of millionaires, and (b) change in the *population* of millionaires (Kleven et al 2019). For policy purposes, what matters is the change in the population of top taxpayers: how many taxpayers are lost when tax rates rise, and how much revenue is lost due to the migration. 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 themselves are very low in number, this translates into a small change in millionaire population. A 6.8 percent change in the flow translates into a loss (semi-elasticity) of 0.3 percent of the millionaire population (see Appendix V).[15]

Our D.i.D. estimate from the event of the TCJA tax reform is -0.052, meaning each percentage point change in tax rates causes a 5.2 percent change in migration flows away from high-tax states, a slightly smaller semi-elasticity of 0.2. 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.

These effect sizes do not imply that states should cut top tax rates to attract or retain millionaire population. In these estimates, the loss in millionaires is small relative to the revenues generated from a higher tax rate. For example, our estimates imply that California and New York together lost 572 millionaires due to the TCJA, while Texas and Florida gained 281. This is costly for the sending states, and the estimated total revenue loss to CA + NY was nearly $100 million. However, if these states cut their top tax rates to offset the TCJA, the revenue loss would be on the order of $4 billion – simply because the population of non-movers is so large. Trying to retain or attract millionaires by cutting top tax rates results in very large revenue losses for a state. Incorporating these estimates into a formula for optimal (revenue maximizing) tax rates implies that states could impose significantly higher rates on top earners (Piketty and Saez 2013; Young et al 2016).

As a caveat, these estimates 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 or the local economy. For example, if LeBron James leaves the LA Lakers, it could harm the performance and productivity of the remaining players. On the other hand, this analysis also does

[15] For the average state, this implies that a one-point tax difference causes roughly 13 extra out-migrations and 12 fewer in-migrations, from a base population of over 9,000 millionaires – amounting to a population loss of one-third of one percent.

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 into, 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.

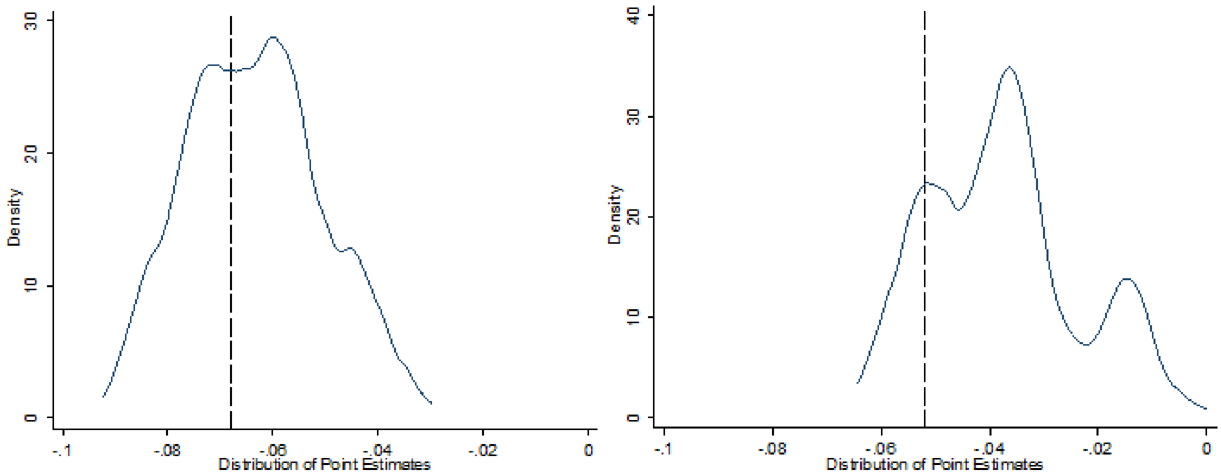
Multiverse Analysis: Model Robustness

Next, we conduct a multiverse analysis to evaluate how robust these results are to model specification, testing our results across more than 3,000 model specifications (Young and Holsteen 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 questionable and open to exclusion. This control variable multiverse estimates all possible combinations of these controls, providing $2^9 = 512$ models. We also extend this to consider plausible choices about data measurement issues. We consider using location / 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[16], and total gross income. Estimating each data choice with all combinations of the controls yields a full multiverse of 3,072 models. Figure 5 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 5 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, but still largely consistent with what other plausible models could report.

[16] 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 5: Multiverse Analysis

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



Note: Estimates from 3,072 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) and three income definitions (AGI, AGI minus capital gains, and total income).

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. A critical distinction is that these forms are sent to IRS at different times, and in 2020 they offer 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 in March.[17] 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 months or more of the pandemic.

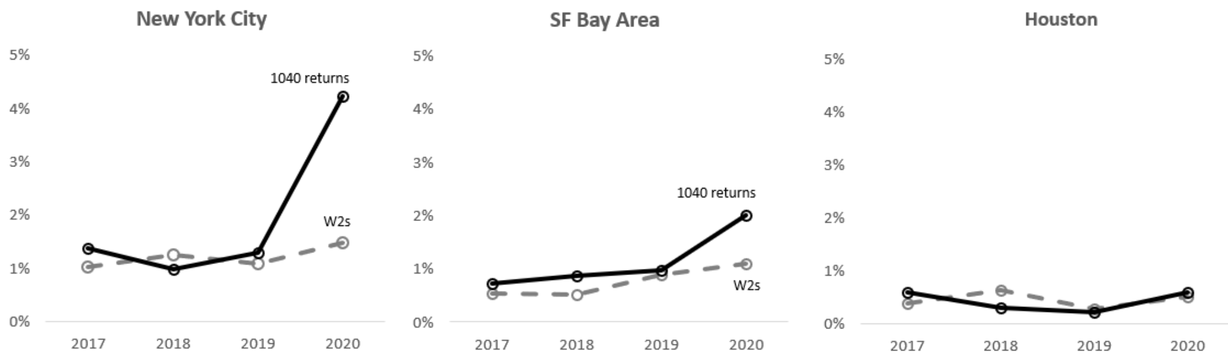
We estimate migration using both measures – the W2s sent in January, and the 1040s returns filed mid-year or later, and look for patterns of differences in migration before and after the onset of COVID. Similar before-to-during analyses have found a sharp rise in loneliness and a steep drop in trust 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 (a)). During 2017-2019, the W2s and the 1040s showed the same steady net out-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 rose dramatically (+3.0 percentage points). This suggests about 2.6 percent of NYC millionaires moved to a different state due to COVID.[18] A similar pattern is seen in the Bay Area of California, but the Covid-19 out-migration was much more muted. 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, TX, a high-density city 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 occurred in some places but not others.

[17] COVID was declared a national emergency on March 13, 2020.
[18] A similar proportion left the city but remained in New York state.

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

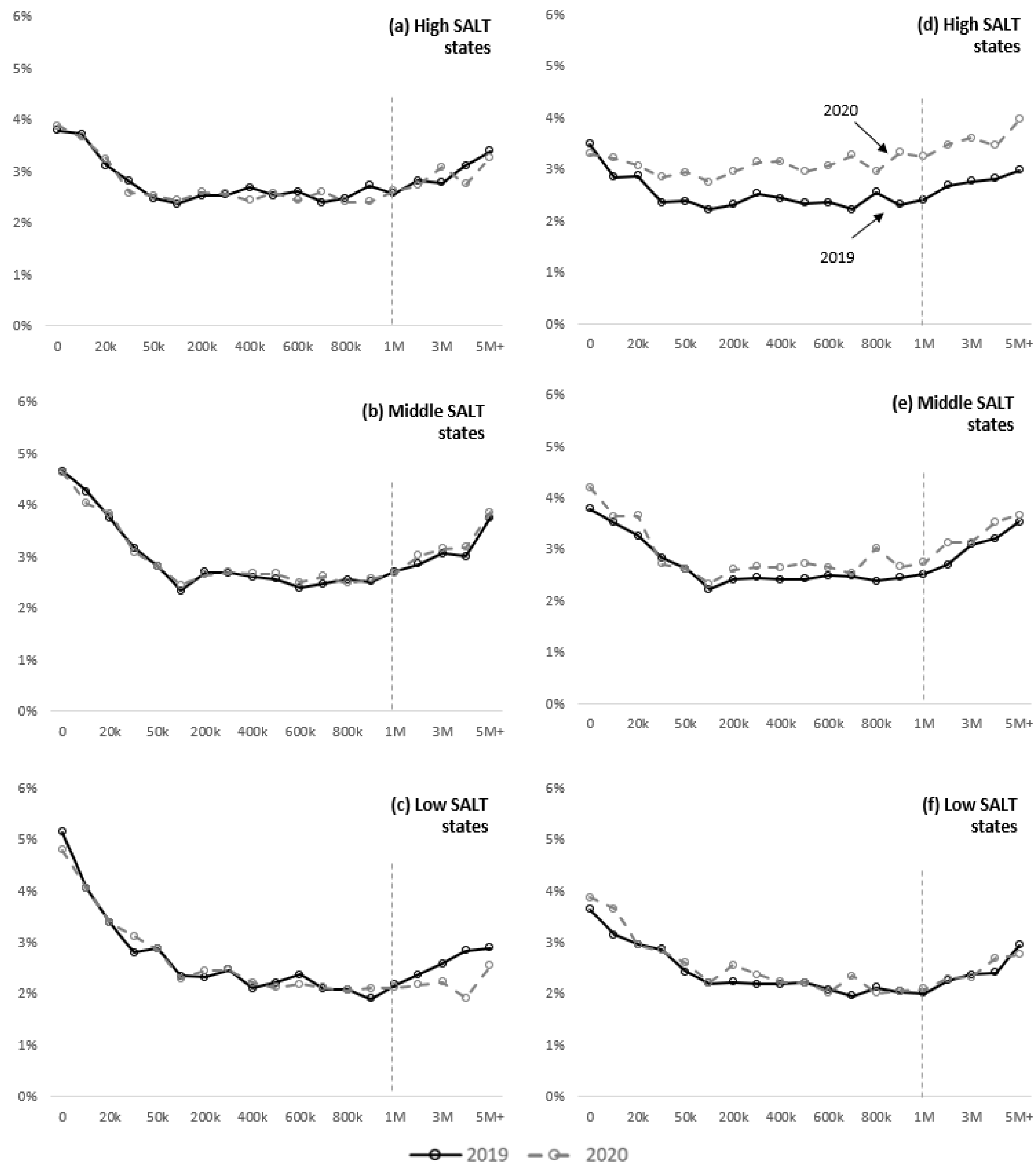


For a more detailed view, Figure 6 shows migration rates by income level, immediately before (left column) and during (right column) the pandemic. The W2s show that 2020 began as a normal year: migration rates by income were identical to the year prior. The 1040 returns filed mid-year show migration rates are elevated for only 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.[19] The second row shows the middle tax states, where very modest migration is observable for high-income earners (roughly 0.1 percent of those making $500k or more). The third row shows the low-tax states where there is no before-after difference observable in any significant 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.

[19] 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

W2s: Pre-Covid | **1040 Returns: During Covid**



COVID migration was place-specific, and appeared largely 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. We want to account for features of the pandemic that may have coincidental correlations with state tax policies. For this, 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 more immediate in the decision behind pandemic-era migration.

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. Model 4 indicates that tax rates affected the probability of migration, but only during 2020 and only when the pandemic was in force. 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. 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 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 with smaller standard errors is strongly significant. 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. (The main effect of year 2020 in the interactive model 6 is specific to millionaires in places with the lowest population density and lowest COVID rates; these households were less likely to move than in prior years.)

Next, we conduct a placebo test of the 2020 tax effect. We look at a form of migration that should *not* be influenced by interstate tax differences: the decision to migrate to a different county in the same state. Applying the model 6 specification to the 1040 data on within-state migration, we continue to see a significant 2020 effect of moving away from high population density but the 2020 tax effect is no longer observed. This placebo test increases confidence in the underlying research design, showing a tax effect only on interstate migration, and not for migrations within state. Finally, we include county-level average home value as a potential explanation of COVID migration. Model 8 shows that millionaires living in more expensive areas have lower migration rates (-0.121). During COVID, this attachment to areas with expensive housing was greatly diminished, as shown by the interaction term in Model 9 (average home value x 2020, +0.078). Further, this largely accounts for the tax effect, which falls from .047 in model 6 to .015 in model 9. The population density interaction is also no longer significant in model 9. This suggests that the migration spike that followed the onset of COVID-19 is better described as driven by housing costs rather than tax rates or population density. This does not change our understanding of *which* states faced millionaire out-migration during COVID, but rather *what feature* of those states spurred the migration. If we consider high home values a marker of agglomeration economies, these results suggest that COVID weakened agglomeration forces, allowing elite workers to live in less expensive areas while still participating in high-wage economies.

Table 3

Probability of migration models, 2019 and 2020

Millionaires

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
	W2s (pre-COVID)	1040s (COVID)	W2s (pre-COVID)	1040s (COVID)	W2s (pre-COVID)	1040s (COVID)	1040s (COVID) within state	W2s (pre-COVID)	1040s (COVID)
Year 2020	**-0.031**	**0.443****	**-0.085**	**-0.009**	**-0.258**	**-1.195***	**-1.379***	**-0.238**	**-1.015***
	(0.034)	(0.138)	(0.044)	(0.105)	(0.165)	(0.472)	(0.663)	(0.154)	(0.441)
Relative tax rate			**0.016**	**0.012**	**0.004**	**-0.002**	**-0.009**	**0.053**	**0.050**
			(0.058)	(0.058)	(0.047)	(0.047)	(0.022)	(0.039)	(0.040)
Relative tax rate X 2020			**0.012**	**0.086***	**0.005**	**0.047*****	**0.022**	**0.003**	**0.015**
			(0.009)	(0.034)	(0.009)	(0.010)	(0.025)	(0.015)	(0.013)
Log population density					**-0.069**	**-0.057**	**-0.025**	**0.018**	**0.034**
					(0.069)	(0.056)	(0.048)	(0.081)	(0.070)
Log population density x 2020					**0.024**	**0.170***	**0.224***	**0.022**	**0.114**
					(0.027)	(0.070)	(0.095)	(0.026)	(0.065)
COVID Rate					**0.004**	**0.004**	**-0.000**	**0.003**	**0.003**
					(0.003)	(0.002)	(0.001)	(0.003)	(0.002)
COVID Rate X 2020					**0.001**	**0.003*****	**0.000**	**0.001**	**0.003*****
					(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Average home value								**-0.121*****	**-0.129*****
								(0.028)	(0.026)
Average home value x 2020								**0.003**	**0.078*****
								(0.017)	(0.017)
Demographic controls?			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	2.700***	3.392***	5.534***	6.484***	5.768***	6.178***	4.656***	5.615***	6.480***
	(0.180)	(0.258)	(0.318)	(0.425)	(0.437)	(0.563)	(0.509)	(0.520)	(0.580)
Observations	976,885	964,853	976,885	964,853	976,885	964,853	938,519	976,885	964,853
R-squared	0.000	0.000	0.005	0.006	0.006	0.007	0.003	0.006	0.007

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

Gravity Models

The previous analysis showed that millionaires in higher-tax states become more likely to move out of state in 2020, while those in low-tax states did not. Conditional on moving during the pandemic, was there a change in migration destinations as well? Simple models show that destination patterns were largely unaffected by the pandemic. In Table 4, 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 4

Gravity models of millionaire migration

	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. Allmodels include the same covariate set as Table 2
*** p<0.001, ** p<0.01, * p<0.05

Discussion and Conclusion

The extent to which states and nations should tax the rich is one of the central policy debates in this age of rising inequality. Ideally, these taxes reshape the distribution of income in society while financing public goods and services that improve quality of life. Neither of these goals are well served, however, if taxes on the rich 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. If economic action is embedded in "ongoing structures of social relations" that shape and constrain market behavior, this provides a layer of insulation from market incentives and pressures (Granovetter 1985:481; Macaulay 1963).

We study the roles of incentives and embeddedness in elite tax flight across two large-scale natural experiments: the 2017 federal tax reform that created new incentives for some types of 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 (tax-induced) migration of top earners, drawing on big administrative data from Internal Revenue Service microdata – providing millions of observations of millionaire residency and migration before and after both shocks.

We find that millionaires typically have low rates of migration, are rooted in place by socio-economic ties such as marriage, children at home, and business ownership. Young, unattached top-earners are highly mobile, but this group is a small subset 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 reformed increased the incentives to reside in a low-tax state, it did not affect the probability of migration among the rich. However, when we focus just on movers – tax responsiveness conditional on migrating – we do find that tax incentives matter. The TCJA did not increase the number of movers, but nudged movers towards lower-tax states. As a result, states like New York and California incrementally lost millionaire population, while Florida and Texas gained millionaires. The magnitudes, however, were small relative to base populations (less than one-half of one percent). We estimate that California and New York jointly lost nearly $100 million in revenue due to migration caused the TCJA. However, if those states cut taxes to offset the TCJA migration incentives, revenue losses would be measured in the billions. Taxes on the rich are not costless, but states have considerable fiscal capacity to set millionaire tax rates and can generate large revenues by setting rates higher.

At the same time, elite embeddedness is not constant. When the pandemic came, a large number of people moved to a different state. Closing schools, work from home policies, and lockdown separation from friends and family led many to decouple where they live and where they work. The new migration was concentrated among high-income earners in high-tax states. Paying a higher income tax rate than one would in Florida does not normally affect household migration propensities, but it did in mid-2020.

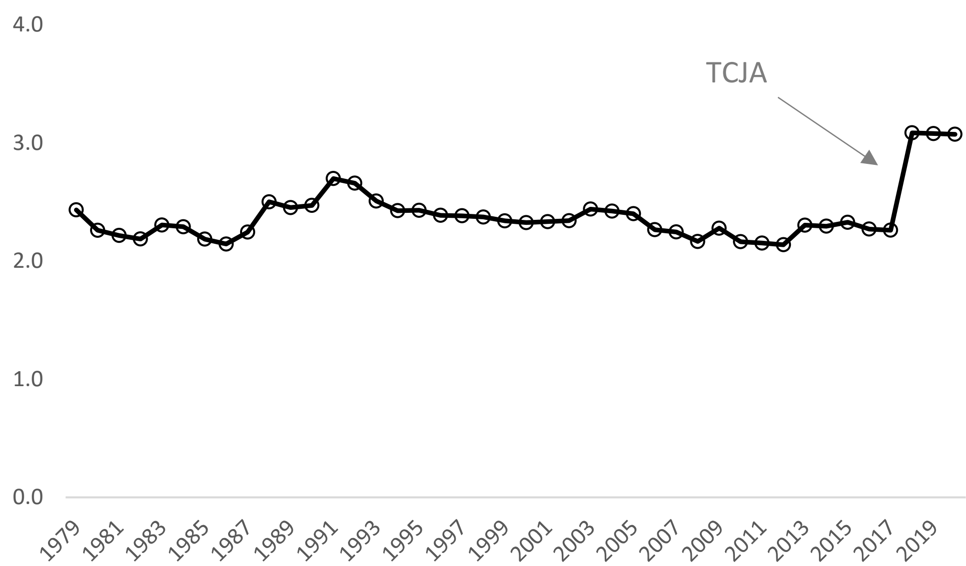
We also find, however, that COVID-19 weakened elite embeddedness and led top-earners to question the ongoing merit of living in an expensive, high-tax state. The pandemic seemingly brought on some of the tax-flight migration warned by critics, which the tax reform alone could not do – and was not observed even six weeks before the pandemic began. Ultimately, we find that this pandemic-era tax effect is better explained by migration out of areas with expensive housing, rather than tax avoidance *per se*. Nevertheless, elite embeddedness was significantly weakened during the pandemic. Many top-earner households evidently had an underlying preference to live in a less-costly place but were not willing to make the move in normal times. Once pandemic restrictions arrived, with limited face-to-face interaction, shuttered local amenities, and new work-from-home practices, households began leaving expensive, high-tax states.

These results support the view that tax flight is a product of both incentives and embeddedness. Elite embeddedness dampens financial incentives for interstate migration, and at some level seems essential to state capacity and policy autonomy (Campbell 1993; Allen and Campbell 1994). Embeddedness allows states and places to experiment with new fiscal policies without risking elite exodus or deep loss of their tax base. 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 TCJA. This is not the fiscal crisis that was predicted after the passage of the 2017 federal tax reform – high-tax states continue to have a much larger millionaire population than low-tax states – but it raises questions for the future. Are work-from-home policies here to stay, or will elite offices return to their pre-pandemic concentrations in major cities? Will remote technologies make place-specific social capital less important in the future?

Appendix I. The TCJA Interstate Tax Increase in Historical Context

In this appendix we document that the TCJA led to an historic increase in the tax differences between states. In the 38 years between 1979-2017, the mean difference in top tax rates between any two state pairs was equal to about 2.3 percentage points of annual income. After the TCJA, this difference rose to 3.1, an increase of 0.82 percentage points. The largest prior increase was in 1991, with a 0.26 percentage point rise.

Figure A1. Average Difference in Top Income Tax Rates Between State Pairs, 1979-2020



Note: Author's calculations using TAXSIM. For this measure, first we compute the combined federal and state effective income tax rates for every state, by year, for those earning $1 million in household income. Next, we calculate the difference in tax rates between every state pair, take the absolute value, and then average across all state pairs.

Appendix II. 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 A2: Probability of Migration (2-Year Lag), 2015-2020

	$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 III: 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.

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

information returns

	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 IV: 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 V. Migration and Revenue Estimates of a 1% Millionaire Tax

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

1. Predict in- and out-migrations for each state using actual tax rates (over the period 2000-2011).
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 revenues 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. Finally, 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).

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