

The Impact of the 2017 Tax Cuts and Jobs Act on the U.S. Housing Market And State Income Tax Revenue Collections, So Far

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Abstract

The 2017 Tax Cuts and Jobs Act (TCJA) has dramatically reduced the number of households who itemized deductions on their 2018 federal income taxes and it has therefore altered the incentive to own a house. U.S. housing market data show a reduction in demand to own a home and a slowing of price appreciation for high-tier homes since the enactment of the law. This federal tax law change also altered many state and local effective income tax rates. Using recently released income tax revenue collection data for 39 states for fiscal year 2019, we find that changes to a state's FY19 personal income tax revenue collections come in at a slower rate than average as a state's personal income tax rate begins to exceed 7.0 percent. TCJA is motivating net-outmigration of high-income taxpayers to states with no income tax. Moreover, evidence from earlier periods using IRS data for three states, supplemented by academic research using data from other sources indicate that, at a minimum, any increase in the net-outmigration rate above what it was in the year before the income tax rate increase remains steady for several years after the tax law change. The impact of TCJA is not going to dissipate.

Key words: housing, regional migration, state income tax rates, state tax revenues

Economic Literature Codes: H24, H71, R23 and R21

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1. Introduction

Several changes to state and federal tax laws appear to be hastening an outmigration of high-income earners from a number of states in the Northeastern United States, particularly New York and Connecticut. This outmigration pattern has led to a significant loss of tax revenues in these states as well as their major cities, most notably New York City. We argue that these changes are part of a wider trend.

In December of 2017, Congress passed the 2017 Tax Cut and Jobs Act (TCJA). This federal tax law limits the home mortgage interest deduction (MID) on the first \$750,000 of mortgage debt (reduced from the pre-TCJA limit of \$1 million of mortgage debt) for mortgage loans taken out after December 15, 2017. In addition, homeowners may no longer deduct interest paid on home equity loans, unless the debt is used to buy, build, or substantially improve the taxpayer's home that secures the loan. Homeowners still may deduct mortgage interest on both their primary residence and a second home, as long as the second home is not rented out during the tax year.

Taxpayers also can still deduct state and local real estate, personal property, and either income or sales taxes in 2019, but the TCJA capped the total state and local tax (SALT) deduction at \$10,000. Since TCJA severely reduces the SALT and MID deductions, these changes to the federal tax law have markedly raised the average effective tax rate paid by citizens in states with high personal income tax rates, like New York, Connecticut, Maryland and Washington DC vis-à-vis other states. Alternatively the TCJA tax law raised the standard deduction to \$24,400 for married couples, lowering the overall federal tax bill for many U.S. households in 2018. This had the secondary impact of raising state taxable incomes, and additionally motivating many individuals, even those with lower priced homes to no longer deduct their mortgage payment and instead take the standard deduction.

Other than taxes, individuals leave an economic area for a variety of reasons, including crime, weather, family, and better economic opportunities in the destination area. However, recent tax law changes have provided a particularly strong impetus to flee less favorable tax burdens. The contribution of this paper is to detect the initial impact of the 2017 Tax Cuts and Jobs Act on state income tax revenues by looking at recently released data on the year-over-year change in personal income tax revenue collections (PIT) from 39 states, for fiscal year 2019.¹ The results support the vote with their feet hypothesis. This is the first analysis to directly assess the long-term impact of the 2017 TCJA tax change on state tax revenues collections to date.

The outline is as follows: Section 2 reviews the historical academic evidence of the impact of tax rates on net-outmigration.² This insight is needed to understand the effects tax increases have on the behavior of the people most impacted by TCJA. In Section 3, in the absence of net-outmigration data for the year 2018 into 2019 which is not available yet, we use home price appreciation as a proxy. We track property price changes through 2019 on high-tier homes for 16 major core based statistical areas within states (CBSAs, also called cities in this report). In Section 4, we present

¹ The fiscal year 2019 revenues are the tax revenues collected on income earned in 2018. We do not include any corporate income tax revenues in this data series.

² Net-outmigration = outmigration-inmigration.

direct evidence of TCJA's impact on tax revenue collection using state income tax receipt changes for fiscal year 2018/2019 (FY19). Section 5 contains empirical evidence showing that tax rates, not economic conditions are what has driven some state income tax revenue collections to slow in FY19 despite a strong economy. Our conclusions summarize what we have learned so far about the impact of TCJA: who wins and who loses. Finally, in the appendix we calculate how much TCJA raised state average effective income tax rates in 2018.

2. Prior research

Several Northeastern states have long been concerned about the impact of high state income tax rates on net-outmigration and, by extension, total state income tax revenue. The states of Connecticut and New Jersey have employed academic researchers to determine if each respective state's high income tax rate was causing a net-outmigration (out minus in) of its top income earners.

Thompson (2011) using annual IRS migration data from 1988 to 2006 for Connecticut studied the impacts of economic as well as fiscal factors on migration, including measures for income taxes, sales taxes, total state and local government revenues, crime, and educational services. He finds that taxes do not play a very important role in outmigration. He notes:

1. More than half of American adults have never lived in any state other than where they were born, and just 3 percent of Americans move across state lines in a given year.
2. The rate of people leaving New England and Connecticut is much lower than the national average.
3. The vast majority of households that move indicate employment, family, and housing as the main reason for their move.
4. Results of analysis of migration suggest there is no simple impact of taxes on migration. Other economic conditions, property crime rates, and higher education enrollment all impact migration in anticipated ways. Overall the results suggest that taxes do not directly cause out-migration, but do influence the choice of destination for some migrating households, and by extension, rate of net-outmigration.

Cohen, Lai, and Steindel (2011) perform a similar analysis for the state of New Jersey. Using the same annual IRS migration data but from 1992 to 2008, they find that variations in differential average marginal tax rates are associated with small but significant effects on net out-migration from a state. They find that by the end of the last decade, the state's cumulative losses from increases in average marginal tax rates after 2003 (most importantly the 2004 "millionaires' tax") totaled roughly 20,000 taxpayers and \$2.5 billion in annual income. Thus the conclusions of the two studies, although focusing on different states, conflict with each other.

These same mixed results apply to more formal academic studies. Cohen, Lai, and Steindel (2014) find mixed evidence of tax-induced migration of the general population. Young and Varner (2011) and Varner and Young (2012) find no evidence of tax-induced migration in the case of

millionaires' taxes in California and New Jersey. Bakija and Slemrod (2004) find a moderate effect of state personal income tax on the number of federal estate tax returns.

Kleven, Landais and Saez (2013) look at migration of professional soccer players in 14 European countries in response to individual country income tax rates. They find strong evidence of player mobility in response to lower tax rates from competing countries of this league. However, Mazerov's (2014) survey of several academic and non-academic works concludes that there is almost no impact of tax rates on outmigration. He summarizes most of the pre-2014 literature on migrations and concludes:

First, policymakers in most relatively high-tax states still have considerable room to increase income taxes on the affluent before they should worry about the potential effects on migration.

Second, and more important in the current policy environment, states should not cut their income taxes with the expectation that they will thereby significantly slow or let alone reverse the flow of residents leaving their state. Indeed, the opposite may well be true. Such cuts are more likely to reduce than enhance a state's attractiveness as a place to live by leading to deterioration in the quality of critical public services.

Akcigit et al. (2015) find elasticities of the number of domestic and foreign inventors with respect to personal income tax rate equal to 0.03 and 1. Higher tax rates encourage outmigration.

Alternatively, Moretti and Wilson (2017) find large, stable, and precisely estimated effects of personal and corporate taxes on star scientists' migration patterns. They track star scientists, defined as scientist in the private sector as well as academia and government with patent counts in the top 5% of the distribution. They calculate a flow elasticity whereby a 1% increase in income due to a personal income tax rate cut increases net-inmigration by 0.4% per year each year until the tax rate change is altered. This is an elasticity of 0.40.

More recently, Giroud and Rauh (2019) answer the same question (do state income tax rates impact location choice) by looking at how state tax rates impact counts of S corporations. Firms organized as S corporations are partnerships or sole proprietorships (so-called pass-through entities).³ So these firms (or the owners of these firms) are directly affected by the individual tax code and other business taxes. They find that a 1% increase (decrease) in the statutory personal income tax rate corresponds to a 0.43% decrease (increase) in the number of establishments belonging to pass-through firms. More germane to this paper, they also find that a 1% increase (decrease) in the statutory personal income tax rate corresponds to a 0.12% decrease (increase) in the number of employees belonging to pass-through firms, an elasticity of 0.12. They find that 3 years after the tax rate was raised, the yearly rate of outmigration of S corporations (i.e., high-income individuals) more than doubles.

³ An S corporation passes profit to owners directly. A C Corporation is a legal structure for a corporation which the owners, or shareholders, are taxed separately from the entity. The taxing of profits from the business is at both corporate and personal levels, creating a double taxation situation.

Lastly, Haidorfer and Sussman (2019) using IRS data on taxpayers with incomes greater than \$200k find that a 1 percent higher state income tax rate increases yearly net-outmigration by 110 of these high-income earners per 100,000. This is an elasticity of 0.11. We also demonstrate that the yearly impact of a tax increase either jumps and then stays constant, or gradually increases each year. The impact, however, does not burn itself out within the 7 years for which we have data.⁴ These results come from historical IRS net-outmigration rates that followed an income tax increase in the states of Maryland, Connecticut and Minnesota during the years 2012 to 2018.⁵

Thus, formal and informal research, which earlier had conflicting conclusions, now show clearly that a state's income tax rate impacts net-outmigration in a statistically significant way. People do vote with their feet. There is a net-outmigration bump from a state raising its income tax rate. How strong is the impact of a 1% increase in a state's income tax rate on net-outmigration (the elasticity)? How big is the bump? Results for a change per year, in the initial year of the tax rate change, vary from 0.03 to 0.50 depending upon the researcher and the cohort analyzed. The third issue is how do these elasticities change overtime? Some empirical evidence suggests that the impact per year is a stable amount each year as long as the higher income tax rate is in force. But other evidence suggests that the impact grows over time so we should expect to see the impact of TCJA more strongly in 2020 and 2021 than what we have witnessed in 2018. At this juncture we argue that the impact of a tax increase does not burn itself out quickly, but more research is needed here.

3. The impact on the high-tier U.S. housing market

3.a Case-Shiller 16 CBSA high-tier homes

The 2017 TCJA capped the total SALT deduction at \$10,000. It also lowered the house price on which the MID is applicable. Since TCJA severely reduces the SALT and MID deduction, these changes to the tax law raise the effective tax rate paid by citizens in states with high personal income tax rates like New York and Connecticut. These higher effective tax rates are likely causing an outmigration to states with lower income tax rates and/or lower property tax rates, without raising any additional tax revenues in the states where the migrants are originally from.⁶ These two changes (MID and SALT) make homes less attractive to new home buyers and cause taxpayers to leave the state. Both of these forces show up as a lower demand for homes and cause home price appreciation to slow or even decline.

Migration data is not yet available for the years 2018 into 2019. In order to see the initial impact of this tax law we proxy changes in migration by looking at home price changes. A reduction in

⁴ In Haidorfer and Sussman (2020), we define burnout as in a time environment in which the income tax rate increase remains in effect, that net-outmigration in the years following a tax increase does not drop back down to levels the concurrent with the year the tax increase went into effect (year T=0 in that paper).

⁵ At the time of this writing, we have just downloaded the 2018 IRS data.

⁶ Here effective is meant as the combined federal and state income taxes actually paid relative to what they were before TCJA passage and is tangential to each state's stated marginal state income tax rate which did not change as a result of TCJA.

the incentive to own an asset (through a tax change) should cause the demand for the good to fall. An increase in supply of the asset (through increased net-outmigration) in high SALT states should also cause prices to fall. We cannot measure net-outmigration by state directly, but net-outmigration causes demand for homes (both expensive and in-expensive) to contract in the states with higher income and property tax rates. We provide indirect evidence on the impact of TCJA on net-outmigration based upon home price appreciation for two different data samples.⁷ Our first sample is home price appreciation (HPA) on 16 CBSAs from Case-Shiller. The second is from Zillow.com.

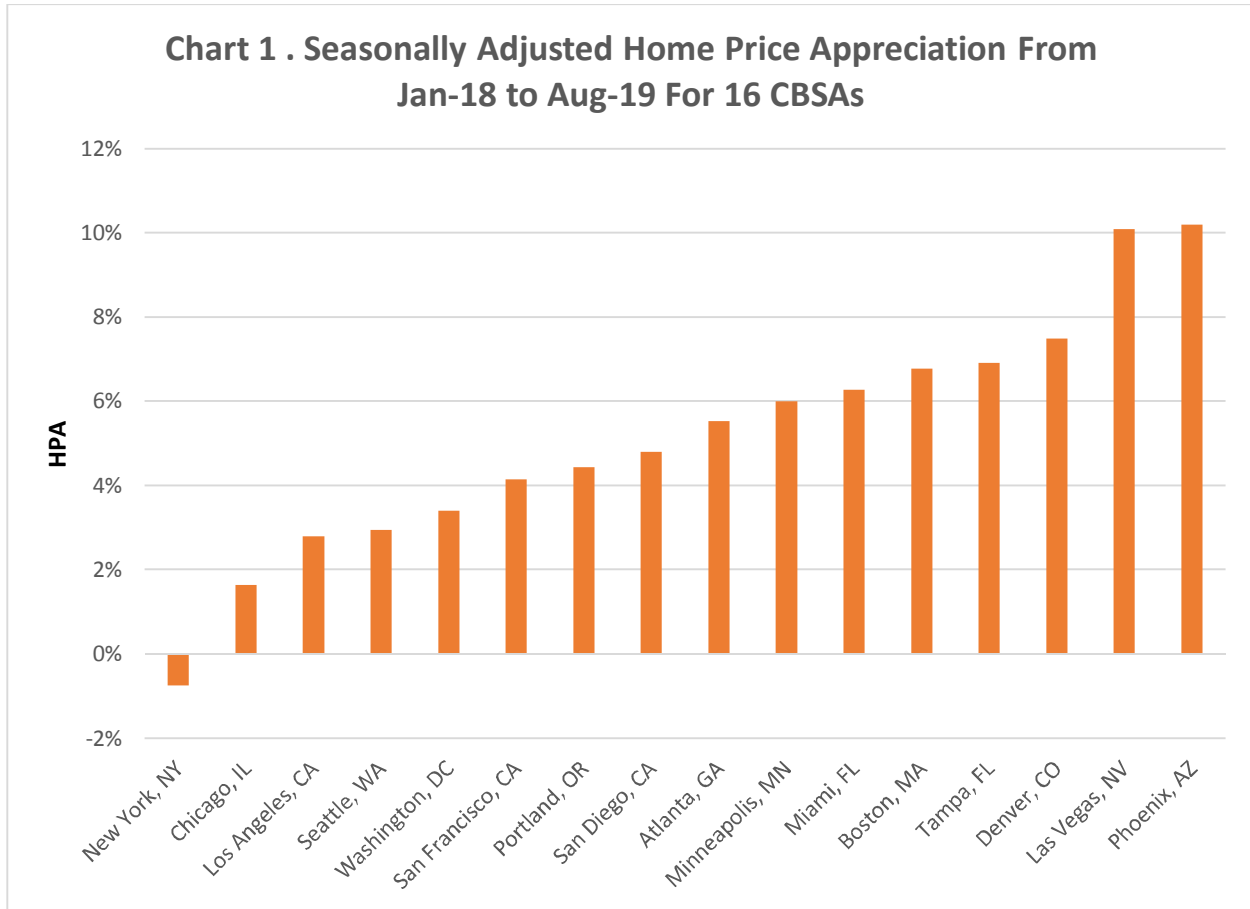
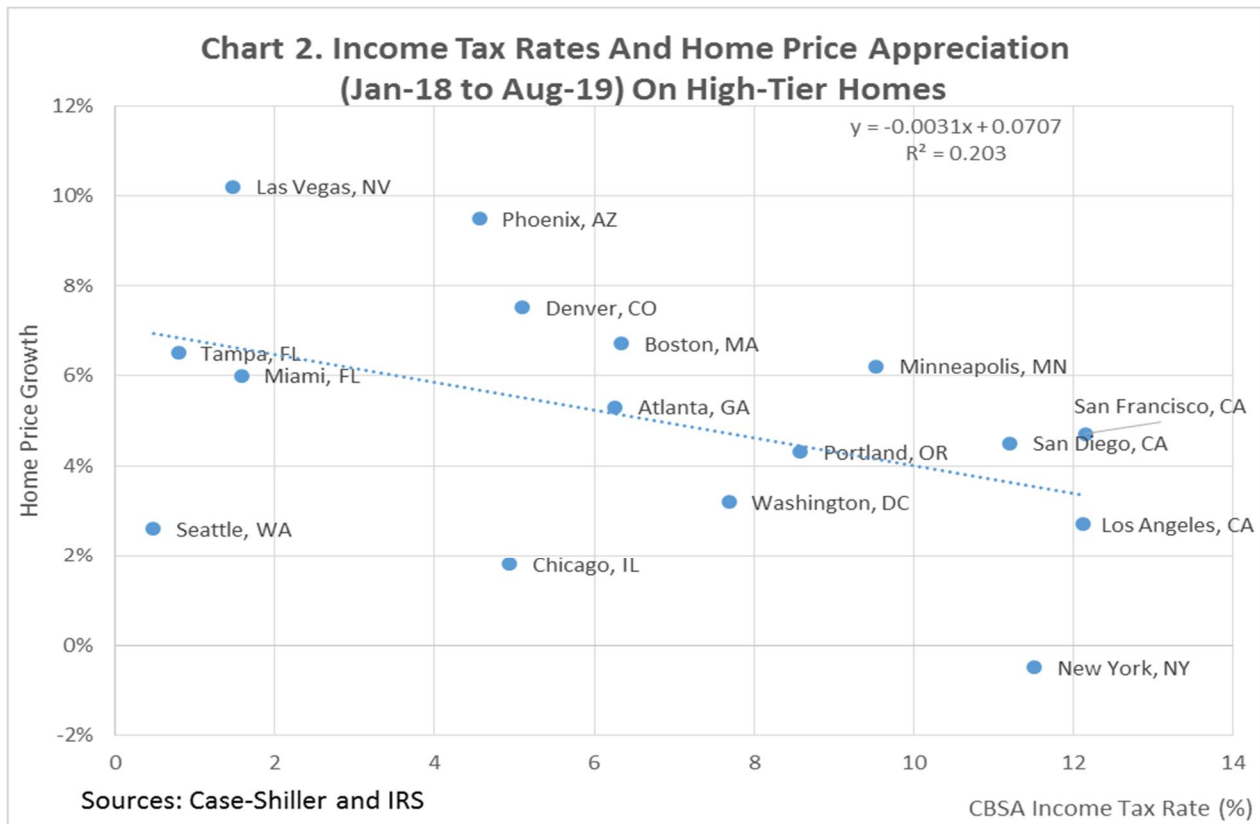


Chart 1 shows Case-Shiller seasonally adjusted home price appreciation (HPA, SA) data for 16 CBSAs. Case-Shiller further breaks homes into high, mid, and low-tier home prices for those 16 CBSAs.⁸ The data in Chart 1 are seasonally adjusted prices on high-tier homes sold. In the chart, we are measuring the growth in home prices from the passage of the 2017 Tax Cuts and Jobs Act on December 2017 to August 2019. Home price growth varied considerably for these CBSAs. The possible causes include better economic growth, taxes and other non-economic events. Charts 2 and 3 offers one possible cause. In Chart 2 home price appreciation has slowed where taxpayers

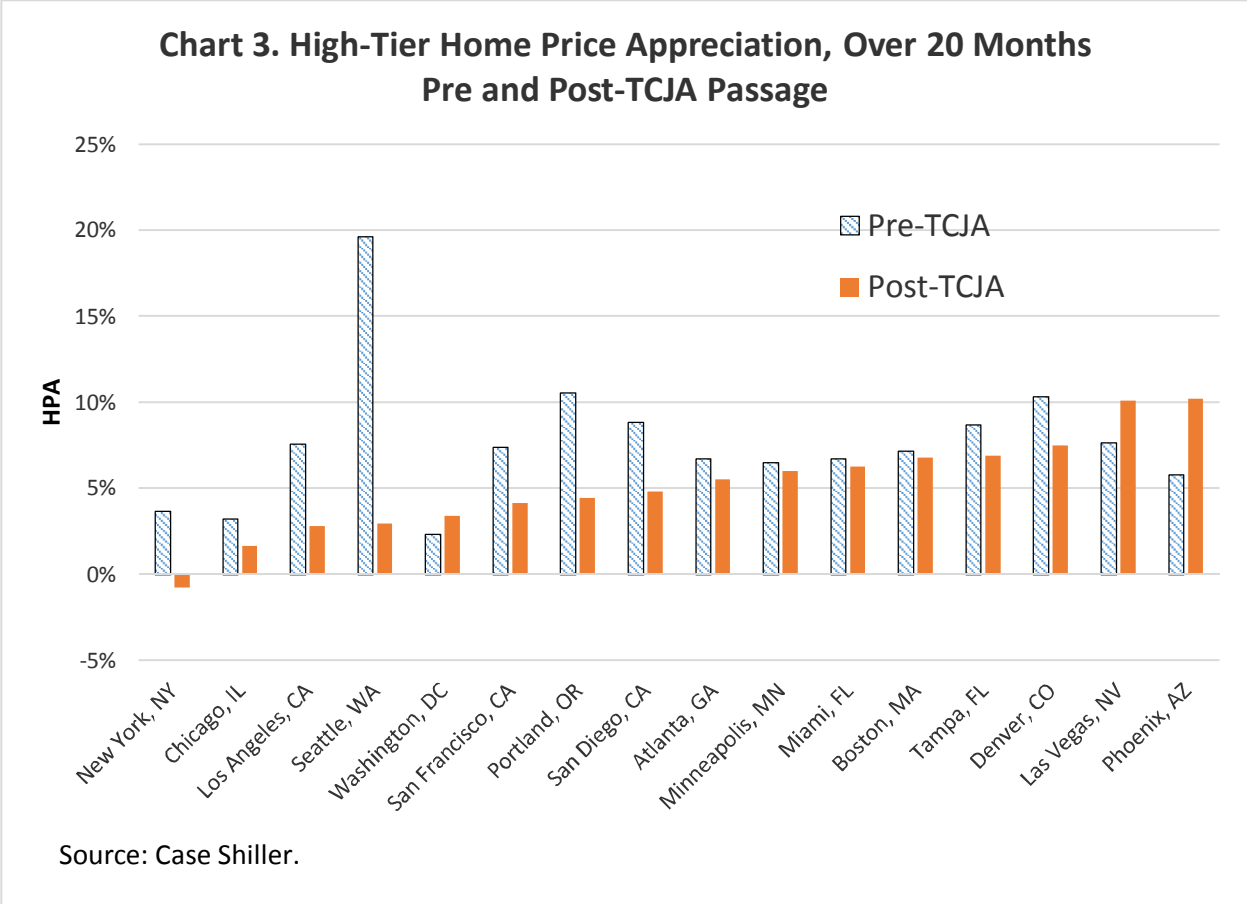
⁷ The author recognizes that a lack of demand in the high-tier price cohort in a given state could largely be caused by homebuyers ratcheting down their asset choice, but remaining in the state. Nonetheless, it also symptomatic of taxpayers leaving the state. This could be in the form of declaring primary residence in another state.

⁸ Case-Shiller track home prices for 20 CBSAs on a monthly basis.

are paying higher income tax rates. Since the enactment of TCJA, the amount of these state income taxes which can be deducted from one's federal tax bill has been capped. Potential property owners see less value in these expensive properties and demand for these expensive properties in major cities is slowly contracting. With the changed incentives taxpayers decide to rent, buy smaller homes, or leave the CBSA, and this has reduced demand for homes in each of these CBSAs. Chart 2 shows that the cities with the highest tax rates are experiencing the biggest impact. It is not surprising that Phoenix and Las Vegas (two CBSAs with very low property and state income tax rates) are on the far right side of Chart 1 and the left side of Chart 2. The correlation between HPA and property tax rate and income tax rates are -0.83 and -0.45, respectively.



There is a second way to look at this. Chart 3 shows year-over-year home price appreciation for two time periods. We designate a pre-TCJA period of 20 months going from Jan-16 to Aug-17 and a post-TCJA period lasting from Jan-18 to Aug-19 (the last period for which we have data). TCJA appears to have provided a jump in real GDP growth and the economy has continued to grow since Dec-17. In those 20 additional months since TCJA inception, home prices did grow and the equity position of homeowners increased. As, Molloy, Smith, and Wozniak (2011) point out, a positive equity position increases net-migration and thus we would expect even higher home price growth following 20 months of strong home price appreciation in the pre-TCJA economy. Buyers should be moving up. Chart 4, however, shows that home price growth was stronger in the 20 months prior to the time TCJA has been in place than in the 20 months since its passage. The reduction of



the MID and SALT deductions has reduced the demand for high-tier homes, even in moderate income and property tax rate states.

3.b Zillow.com 50 CBSA high-tier homes

Zillow.com provides data on high-tier homes for more cities. The data in Table 1 show listed price appreciation in 50 CBSAs for high-tier homes since the enactment of TCJA. The list includes big and small cities. Prices have actually fallen in three of the 50 geographies, so some changes are negative. Similar to the Case-Shiller data, New York is one of three cities where listed prices for high-tier homes have fallen according to Zillow.com. The common thread for these three cities is their comparatively high state income and property tax rates.

The highest income cohort available from IRS data is for incomes greater than \$200k. The average income tax rates in Table 1 are shown for taxpayers with incomes greater than \$200k using data from the IRS’s county-level income database. It is an average actual rate using 2018 IRS data. It is calculated as the total amount of state and local income taxes paid by all taxpayers with incomes greater than \$200k in a given CBSA divided by the number of taxpayers in that income bracket in the year 2018. It includes state and local taxes paid by residents of the CBSA because both taxes have to be paid if there is a local income tax.

The correlation between home price growth over 20 months and property and income tax rates for these 50 CBSAs were -0.58 and -0.48, respectively. Cities with higher property tax rates have had lower home price growth since TCJA was made law. It could be that economic growth was weak in those locations before TCJA passage, but the cause seems directly related to taxes.

Table 1. State Income Tax Rates and High-Tier Home Price Appreciations Since Jan-18 (%)									
		HPA	Inc Tax Rate	Prop Tax Rate			HPA	Inc Tax Rate	Prop tax rate
1	Albuquerque, NM	0.09	4.7	1.5	26	Milwaukee, WI	0.093	7.5	2.1
2	Atlanta, GA	0.09	6.3	1.7	27	Minneapolis, MN	0.111	9.5	1.9
3	Austin, TX	0.14	0.5	2.2	28	Nashville, TN	0.047	0.9	1.0
4	Baltimore, MD	0.04	9.5	2.1	29	New York, NY	-0.064	11.5	2.7
5	Birmingham, AL	0.07	4.4	1.0	30	Oklahoma City, OK	0.056	4.6	1.1
6	Boston, MA	0.15	6.3	2.2	31	Orlando, FL	0.086	0.6	1.4
7	Bridgeport, CT	-0.05	9.2	2.2	32	Philadelphia, PA	0.056	5.6	2.3
8	Charlotte, NC	0.09	6.2	1.4	33	Phoenix, AZ	0.049	4.6	1.2
9	Chicago, IL	0.03	4.9	2.5	34	Pittsburgh, PA	0.066	4.6	2.0
10	Cincinnati, OH	0.09	6.1	1.8	35	Portland, OR	0.051	8.6	2.0
11	Cleveland, OH	0.06	6.7	2.2	36	Providence, RI	0.068	6.9	2.4
12	Columbus, OH	0.08	6.9	2.4	37	Raleigh, NC	0.062	6.4	1.6
13	Dallas, TX	0.05	0.5	2.1	38	Richmond, VA	0.055	6.2	1.4
14	Denver, CO	0.12	5.1	1.2	39	Riverside, CA	0.024	9.6	2.3
15	Detroit, MI	0.06	5.0	1.9	40	Sacramento, CA	0.050	10.0	2.1
16	Hartford, CT	-0.01	7.3	2.9	41	Salt Lake City, UT	0.188	5.7	1.3
17	Houston, TX	0.07	0.3	2.2	42	San Antonio, TX	0.063	0.2	2.0
18	Indianapolis, IN	0.11	5.5	1.3	43	San Diego, CA	0.085	11.2	2.3
19	Jacksonville, FL	0.12	0.8	1.6	44	San Francisco, CA	0.099	12.1	2.1
20	Kansas City, MO	0.09	5.4	1.5	45	San Jose, CA	0.106	12.3	2.2
21	Las Vegas, NV	0.09	1.5	0.9	46	Seattle, WA	0.077	0.5	1.6
22	Los Angeles, CA	0.07	12.1	2.2	47	St. Louis, MO	0.043	5.1	1.5
23	Louisville, KY	0.04	7.2	1.4	48	Tampa, FL	0.090	0.8	1.5
24	Memphis, TN	0.09	1.0	1.5	49	Virginia Beach, VA	0.066	5.9	1.5
25	Miami, FL	0.02	1.6	1.7	50	Washington, DC	0.148	7.7	2.3

Source: Zillow.com, listed home prices high tier, Jan-18 to Sep-19

4. The impact on FY19 state income tax revenue collection

4.a State income tax revenue collection data

We are looking for the impact TCJA had on 2018 state personal income tax revenue collections (PIT). This would be for the fiscal year 2018/2019 (FY19). Finalized tax revenue data became available in October 2019.

Most states impose a broad-based individual income tax. Only seven lack any income tax: Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming. Tennessee and New Hampshire fall into a gray area. They tax dividend and interest income, but not earned income.

Table 2 shows two ways of assessing each state's income tax rate. The first is the marginal tax rate on each state's highest income bracket. These are the rates quoted to tax filers. These marginal rates in columns 3 and 7 are for the year 2018. In columns 4 and 8 are calculated average state and

Table 2. Marginal and Average Tax Rate On High-Income Earners							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	State	Tax Rate (%)			State	Tax Rate (%)	
		Marginal 18	Average 18			Marginal 18	Average 18
1	Arkansas	6.90	5.91	27	New Jersey	8.97	8.83
2	California	12.30	12.19	28	New Mexico	4.90	4.67
3	Colorado	4.63	5.22	29	New York	8.82	12.26
4	Connecticut	6.99	8.87	30	North Carolina	5.50	6.26
5	Delaware	6.60	6.98	31	North Dakota	2.90	2.28
6	Florida	0.00	1.41	32	Ohio	5.00	5.64
7	Georgia	6.00	6.25	33	Oklahoma	5.00	4.55
8	Hawaii	11.00	8.08	34	Oregon	9.90	10.00
9	Idaho	6.93	7.88	35	Pennsylvania	3.07	5.12
10	Illinois	4.95	4.89	36	Rhode Island	5.99	7.06
11	Indiana	8.25	5.63	37	South Carolina	7.00	6.00
12	Iowa	7.40	6.82	38	South Dakota	0.00	0.89
13	Kansas	5.70	5.30	39	Tennessee	3.00	1.07
14	Kentucky	6.00	7.38	40	Texas	0.00	0.46
15	Louisiana	6.00	4.27	41	Utah	5.00	6.35
16	Maine	4.60	8.28	42	Vermont	4.00	7.87
17	Maryland	5.75	9.60	43	Virginia	5.75	6.45
18	Massachusetts	5.10	6.41	44	Washington	0.00	0.70
19	Michigan	4.25	5.02	45	Washington, DC	8.95	9.59
20	Minnesota	9.85	9.71	46	West Virginia	6.50	7.03
21	Mississippi	5.00	4.80	47	Wisconsin	7.65	7.12
22	Missouri	5.90	6.61	48	Wyoming	0.00	1.71
23	Montana	6.90	6.89	49			
24	Nebraska	6.84	6.55	50			
25	Nevada	0.00	1.95	51			
26	New Hampshire	2.00	2.05				

Source: Marginal tax rate is from each state's department of revenue, average is from IRS 2018 data

local tax rates for citizens living in that state. The "Average 18" series of income tax rates (columns 4 and 8) are shown for taxpayers with incomes greater than \$200k using data from the IRS's county-level income database. It is calculated as the total amount of state and local income tax paid by all taxpayers with incomes greater than \$200k in a given state divided by the number of taxpayers in that income bracket in the year 2018. It includes local taxes because they have to be paid also. These IRS tax rates are calculated averages from the IRS 2018 database.

Five states in 2017, altered their tax rate structure:

- 1) Hawaii reintroduced a peak marginal income tax rate of 11%, up from 8.25%, on all income over \$200,000 for single filers. This peak rate was instituted in 2009 as a temporary tax increase, but it previously expired in December 2015.

- 2) Illinois passed a 32% increase to its individual income tax rate, from 3.75% to 4.95%. However, the increase was designed to be blended in during 2017 and enacted fully in 2018. In plainer terms, Illinois residents paid 3.75% for the first half of the year on their earned income and 4.95% for the second half of 2017. Meanwhile, in 2018, they paid a 4.95% in state income tax on their earned income.
- 3) Kansas increased its state income tax by 0.2% (2.7% to 2.9%) for those earning \$30,000 or less, 0.3% (4.6% to 4.9%) for those making between \$30,001 and \$60,000, and 0.6% (4.6% to 5.7%) for folks making more than \$60,000.
- 4) Although Tennessee forgoes a wage income tax, it does as mentioned above impose a tax called the Hall Income Tax on interest and dividend income. That tax is being phased out, with the rate dropping from 4 in 2017 to 3 percent on January 1 in 2018.
- 5) Idaho lowered all personal and corporate income tax rates by 0.475 percent in 2018. This lowered the highest marginal rate to 6.925%

These five states were dropped from our sample because we are trying to circumvent any changes in 2018 net-migration caused by individual state tax rate changes. We are trying to isolate the changes caused in 2018 by TCJA. By including the District of Columbia, and New Hampshire, we are left with 39 markets in which income tax rates were static from the prior two years.

Table 3. Impact Of TCJA on Average State Income Tax Rates (incomes > \$200K)									
(1)	(2)	(3) State Avg Income Tax Rate			(6)	(8) State Avg Income Tax Rate			(10)
	State	Average 18	Effective 18	Δ		State	Average 18	Effective 18	Δ
1	New Jersey	8.83%	17.37%	8.54%	27	Georgia	6.25%	10.70%	4.45%
2	New York	12.26%	20.33%	8.07%	28	Missouri	6.61%	11.04%	4.43%
3	California	12.19%	20.11%	7.92%	29	North Carolina	6.26%	10.60%	4.34%
4	Vermont	7.87%	15.13%	7.26%	30	Kansas	5.30%	9.52%	4.23%
5	Connecticut	8.87%	15.84%	6.97%	31	South Carolina	6.00%	9.95%	3.94%
6	Maryland	9.60%	16.15%	6.55%	32	Utah	6.35%	10.18%	3.83%
7	Minnesota	9.71%	16.18%	6.48%	33	Indiana	5.63%	9.39%	3.76%
8	Oregon	10.00%	16.43%	6.43%	34	West Virginia	7.03%	10.76%	3.74%
9	Maine	8.28%	14.64%	6.37%	35	Colorado	5.22%	8.93%	3.71%
10	Washington, DC	9.59%	15.79%	6.20%	36	Arizona	4.57%	8.09%	3.51%
11	Rhode Island	7.06%	13.23%	6.17%	37	Texas	0.46%	3.93%	3.47%
12	Illinois	4.89%	11.00%	6.11%	38	New Mexico	4.67%	8.06%	3.40%
13	Massachusetts	6.41%	12.00%	5.59%	39	Mississippi	4.80%	8.17%	3.37%
14	Wisconsin	7.12%	12.63%	5.52%	40	Oklahoma	4.55%	7.90%	3.35%
15	Nebraska	6.55%	12.02%	5.47%	41	Louisiana	4.27%	7.41%	3.13%
16	Ohio	5.64%	10.91%	5.27%	42	Arkansas	5.91%	9.02%	3.12%
17	Virginia	6.45%	11.65%	5.20%	43	Florida	1.41%	4.29%	2.89%
18	Iowa	6.82%	11.95%	5.13%	44	Alabama	4.14%	6.77%	2.63%
19	Pennsylvania	5.12%	10.00%	4.88%	45	Washington	0.70%	3.25%	2.55%
20	Idaho	7.88%	12.72%	4.85%	46	North Dakota	2.28%	4.73%	2.46%
21	Delaware	6.98%	11.58%	4.60%	47	Alaska	0.24%	2.58%	2.34%
22	Montana	6.89%	11.46%	4.57%	48	Nevada	1.95%	4.21%	2.26%
23	Hawaii	8.08%	12.61%	4.54%	49	South Dakota	0.89%	3.15%	2.26%
24	New Hampshire	2.05%	6.58%	4.53%	50	Wyoming	1.71%	3.70%	1.99%
25	Michigan	5.02%	9.51%	4.49%	51	Tennessee	1.07%	3.03%	1.97%
26	Kentucky	7.38%	11.85%	4.47%					

Sources: Actual 18 and Effective 18 are the average income tax rate on highest income earners for each state. See Table 5 for explanation of Effective 18.

In Table 3 we take the computed average tax rates for 2018 from column 4 and 7 in Table 2 above and we label them “Average 18” for those states whose tax rate did not change.⁹ We then estimate the impact TCJA will have on each state’s relative federal income tax payment and use this adjustment to build an average effective state income tax rate for each state (Effective 18, columns 4 and 9 in Table 3). The effective state income tax rates for all states are calculated by the Center for Housing Risk Research using 2018 IRS data for the cohort with income greater than \$200k. Again, they include income taxes paid to both the local jurisdiction and the state. Since some taxpayers in states which have a zero state income rate pay some local taxes, the calculated actual and effective state tax rates show up with small positive values due to the local income taxes paid. They are not stated marginal rates. In columns 5 and 10 of Table 3, we show our estimates of how much higher the effective income tax rate is for the highest tax bracket following passage of TCJA (the delta or the bump). The states with the highest actual marginal rate suffer the biggest jump in the effective state income tax rate. In Table 6, we explain our reasoning.

Table 4. Personal Income Tax Revenue Collection YOY Change					
	State	YOY Change		State	YOY Change
1	Alabama	AL	21	Nebraska	NE
2	Arizona	AZ	22	New Hampshire	NH
3	Arkansas	AR	23	New Jersey	NJ
4	California	CA	24	New Mexico	NM
5	Colorado	CO	25	New York	NY
6	Connecticut	CT	26	North Carolina	NC
7	Delaware	DE	27	North Dakota	ND
8	Georgia	GA	28	Ohio	OH
9	Indiana	IN	29	Oklahoma	OK
10	Iowa	IA	30	Oregon	OR
11	Kentucky	KY	31	Pennsylvania	PA
12	Louisiana	LA	32	Rhode Island	RI
13	Maine	ME	33	South Carolina	SC
14	Maryland	MD	34	Utah	UT
15	Massachusetts	MA	35	Vermont	VT
16	Michigan	MI	36	Virginia	VA
17	Minnesota	MN	37	Washington, DC	DC
18	Mississippi	MS	38	West Virginia	WV
19	Missouri	MO	39	Wisconsin	WI
20	Montana	MT			

Source: Each state's department of revenue, change is FY19 over FY18.

⁹ As we note above, five states did change their income tax rates from 2016 to 2018. The values for Average 18 in Table 4 are thus incorrect for those five states. The data to calculate average state tax rates for 2018 did exist at the time of this writing. We, therefore, dropped those five states from the statistical analysis below. We have just recently obtained this data and are processing it.

4.b Income tax rates and the change in income tax revenues for FY19

To measure the impact on tax revenue collections, we went to each state's website to collect personal income tax revenue collection for both FY18 and FY19. We then calculate the year-over-year change. The results are in Table 4.

We notice in Table 4 that several states' collection of personal income tax revenue declined while most others have increased in FY19. It is true that the local economy in each state varies and some states have more high-income taxpayers, but some consideration must be given to the effect of each state's income tax rate for the highest income earners. Here we use the IRS's cutoff of incomes greater than \$200k to define high-income.

In Chart 4, we plot the TCJA deltas (or the bump) for the 39 states TCJA gave to each state's effective income tax rate for individual with income greater than \$200k (columns 5 and 10 of Table 3) against the year-over-year change in FY19 income tax revenue collections (YOY, FY19 over FY18). In that chart we see a number of important facts:

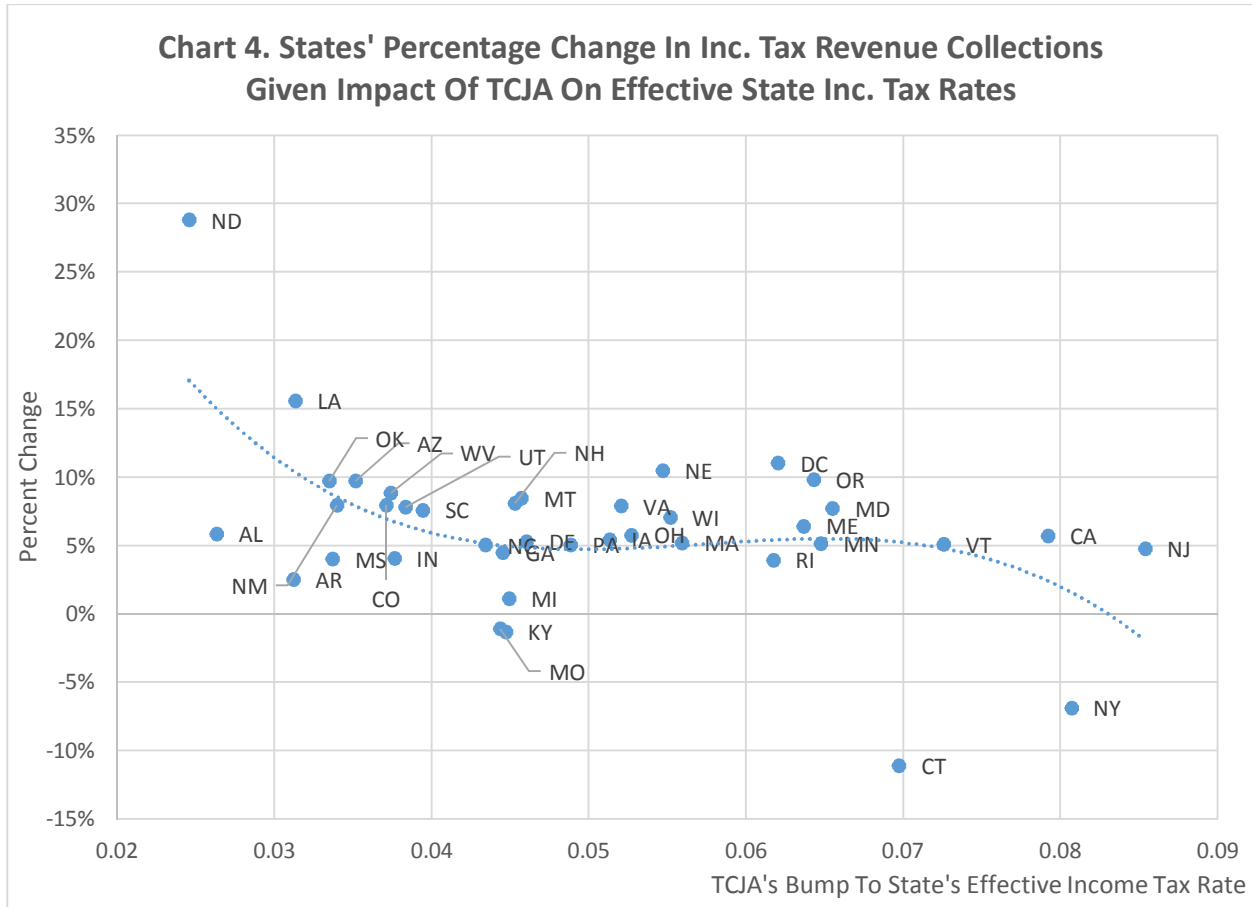
1. The YOY PIT changes averaged a positive 6.1 percent for the 39 geographies. If we ignore North Dakota, New York, California, New Jersey and Connecticut in Chart 4 could we say that states were not impacted by TCJA. There does not seem to be much impact of impact at mid-range deltas. Having said that, we see that the states with the biggest declines in income tax revenue collections were those with the biggest change (or bump) to their effective income tax rate (these would be those the states with the highest state and local tax rates). Again, New York and Connecticut are the stand-out states in this category. This yields a non-linear pattern in Chart 4.
2. Overall, the relationship between income tax revenue growth in FY19 and the TCJA bump is negative. The higher effective income tax rates in high-income tax rate states has likely motivated some high-income taxpayers to leave those states. Leaving the state is not just declaring primary occupancy in a different state.¹⁰ These high-income migrants must have organized themselves during the year prior to passage. This raises the question of burnout again.
3. New Hampshire, which only taxes investment income, witnessed an 8.4% increase in income tax revenues. This suggests that the stock market changes in 2018 were largely positive for high-income investors. Investors from other states probably experienced the same gains as investors from New Hampshire.¹¹
4. Two states (Oregon and Maryland) and Washington, DC which had their income tax rate impacted nearly as much as Connecticut did not suffer major declines in income tax revenues. Why not? Anecdotal evidence suggest that some financial firms prominent in

¹⁰ Transplanting oneself to Florida goes beyond getting a new driver license. According to the Wall Street Journal (January 8, 2020) New York conducted 15,122 residency audits from 2013 to 2017. Of those audits 52% of New Yorkers lost their case costing them an average \$144,000 in additional taxes and penalties.

¹¹ There have been suggestion that stock market declines during end-of-year 2018 were responsible for the loss of tax revenues for the states of New York and Connecticut, but personal income tax revenue collections for the state of New Hampshire (which only collects taxes on investment income) was nonetheless positive. Investors from NY and CT probably fared similarly. So there is no attempt to control for stock market induced gain or losses to PIT in each state.

NY & CT) are moving out, perhaps they can move more easily than industries with more tangible assets or those who need to be close to the government physically.

5. The state of New Jersey is another interesting stand out. It has the highest TCJA bump due to its high property tax rates, but its PIT change of 4.7 percent is only slightly lower than the average. Why would taxpayers in New Jersey respond differently than those in New York?



5. Empirical evidence on what drove FY19 income tax revenue collection changes

To investigate the proposition that changes in states' personal income tax (PIT) revenue collections from FY18 to FY19 were driven by TCJA ó through the impact it had on each states' effective income tax rate and then on net-outmigration -- versus the strength of each states' economy we use a difference-in-difference approach on FY19 PIT data as shown in Equation 1.

$$PIT_i = \alpha + \beta_1 * TCJA_i + \beta_2 * TCJA_sqr_i + \beta_3 * TCJA_cube_i + \beta_4 * EMP_i + \mu_i \quad (1)$$

Where $PIT_i = \ln((\text{personal income tax revenues collected FY19 by state}_i) / (\text{personal income tax revenues collected FY18 by state}_i))$ for 38 states and Washington, DC; TCJA is the difference in effective income tax rate, or Effective18 ó Actual18 (the delta as shown in Table 3); TCJA_sqr is

the square of that difference; TCJA_cube is the cube of that difference and EMP is the two-year payroll growth.

The results are in Table 5. We observe that the higher a state's income tax rate was in 2018 (and consequently the bigger the impact of TCJA (the delta, or the bump), the smaller was the state's increase in personal income tax revenues collections in FY19.

Table 5. Regression Results				
Term	Coefficient	SE	T-s statistic	P-value
Intercept)	0.827**	0.285	2.9	0.006
TCJA	-43.5*	17.746	-2.456	0.019
TCJA_sqr	785.8*	343.469	2.288	0.028
TCJA_cube	-4611.3*	2101.586	-2.194	0.035
emp_chg2	0.458	0.708	0.647	0.520
R-Squared	0.29			
Observations	39			
Significance Codes *** 0.001, ** 0.01., * 0.05.				

This non-linear specification suggest that impact of the TCJA bump on income tax revenue collections depends upon the magnitude of that state's combined 2018 SALT taxes. Roughly for those states with an income tax rate greater than 9 percent in 2018 for taxpayers making more than \$200k per year, TCJA, in effect, raised their average state income tax rate by 7.0 percent (Table 3). This according to Equation 1 indicates that net-outmigration has become high enough to cause income tax revenues to be lower than the average or even decline. Onerously for high SALT states, the TCJA bump is not going to go away and evidence indicates the resulting net-outmigration bump per year, each year, slows down only slightly, but never goes away.

6. Conclusions

The 2017 Tax Cuts and Jobs Act has radically altered tax revenue collections in the U.S. As many economists have advocated, the removal of the MID and SALT deductions reduces the distortion to overconsume housing. However, it is an external shock to migration, housing and tax revenue collections. It has changed the incentive to own a house and where to live.

We are trying to answer five important questions:

1. How much does net-outmigration increase due to a 1% increase in a state's income tax rate?
2. What might happen 3, 4, or 5 years after the tax law change? Does net-outmigration burn itself out, or does it grow over time?
3. How does rising net-outmigration of high-income taxpayers impact state income tax revenues?
4. How much has TCJA raised effective tax rates?
5. How much has TCJA altered high SALT states' income tax revenue collections in FY19?

In looking at prior research and FY19 income tax revenue collection, these are our observations:

- 1) **Net-outmigration:** Empirical evidence indicates that a one percent higher income tax rate causes net-outmigration to jump on average by 110 high-income taxpayers per 100,000 high-income taxpayers in the first year (Haidorfer and Sussman, 2020). Moretti and Wilson (2017) suggests that net-outmigration for very high income earners is even larger. The results from both pieces of research are historical averages. Our research covers households making more than \$200k per year in 2018 based on 50 states and Washington DC.
- 2) **Burnout:** The evidence is that the impact of these types of shocks do not burn themselves out quickly. Historical data from the only three states that have raised their income tax rates at least once in the period from 2012-2018 indicate that the jump in net-outmigration remains as long as five years past the initiation of an external shock like TCJA. This evidence from earlier periods using IRS data for three states, supplemented by academic research using data from other sources indicate that, at a minimum, any increase in the net-outmigration rate above what it was in the year before the income tax rate increase remains steady. This happened at least four years after the initial shock. There is only slight burnout as net-outmigration remains elevated. Competing evidence suggest a rising impact.
- 3) **State income tax revenue collections:** Many individuals in America paid less taxes in 2018 than they did in 2017, a beneficial outcome, all else held equal. A state raising its income tax rate is generally beneficial in the short-run. The downside of TCJA is that it penalizes states that have high income tax rates while changing little for states that have no income tax. By increasing effective tax rates in high SALT states it is hastening net-outmigration. Although we do not have net-outmigration data for 2019 to prove this hypothesis, we can show that home price growth is faltering and income tax revenue collections have weakened in states where taxpayers previously enjoyed high SALT deductions. The data underlying Chart 4 show that TCJA is causing income tax revenues to decline in high SALT states. However, states with strong economies (Oregon) or with incomes driven by firms tied to the local economy (Washington, DC, and Maryland) introduce ambiguity to this strong assertion. Regardless, rising net-outmigration could overwhelm a statesøability to mint new taxpayers. This dynamic is likely to lead to further declines in state income tax revenues in states with high marginal income tax rates. It could also lead to a decline in property prices and property tax revenues, perpetuating a vicious cycle in those states in the absence of policy readjustment by each state.
- 4) **Effective average tax rates:** Our observation on how much TCJA has raised average effective income tax rates in each state is in Table 3 (also see Appendix for explanation).
- 5) **Personal income tax returns:** TCJA has raised 2018 effective income tax rates for all states that have an income tax. Recently released state revenue data show that a statesø personal income tax revenue collections come in at a slower rate than average once a statesø average personal income tax rate (state and local combined) is greater than 7 percent.

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Appendix

In Table 6 below, we start with three identical households, one of which are living in, respectively, New Jersey, Illinois and Florida. Each household is making \$500k and has owned the home since 2018 with a purchased price of \$2.0 million by using a mortgage. We go through the 2018 income tax calculations in columns 2 through 4. Each has made a 20% downpayment of \$400k. We use a mortgage rate of 4.0%. This yields an annual mortgage payment of 64,000 on a \$1.6 million mortgage. In 2018, each of these homeowners could have taken a mortgage interest deduction on \$1.0 million mortgage (row 6). This would have been a MID of an amount of 40,000.¹²

The annual property tax rate for NJ, FL and IL are respectively 3.61%, 1.79%, 2.63%.¹³ This in 2018 would result in our three homeowners each paying \$77,780, \$34,200 and \$62,800 in property taxes, respectively (row 12). The allowable property tax deduction was not capped so each of these three homeowners would use those amounts as a deduction. Additionally, our homeowners would have had to pay a state income tax if they lived in New Jersey or Illinois but not if they had lived in Florida. We estimate that the New Jersey homeowner would have had to pay \$36,388 in state income taxes and the Illinois homeowner would have paid \$24,750. Pre-TCJA, all of these payments could be deducted. These amounts would result in our household in New Jersey comparing total SALT and MID deductions of \$154,188 to the standard 2018 deduction of \$12,700, the household in Florida comparing total SALT and MID deductions of \$74,200 to the standard 2018 deduction of \$12,700, and the household in Illinois comparing total SALT and MID deductions of \$127,550 to the standard 2018 deduction of \$12,700 (row 20).

These deductions would have resulted in taxable income falling to \$345,813, \$425,800 and \$372,450 for New Jersey, Florida and Illinois, respectively (row 26). Since the taxable income for all three homeowners was reduced to close to \$400k, the 2018 federal tax rate was 35%. This result in federal and state taxes of \$235,222, 183,230 and 217,908 in Table 6 for the year 2018 (row 31).

When we do the same exercise under TCJA, all three homeowners decide to itemize rather than take the standard deduction of \$24,400 for married couples. This is true despite the fact that the total of itemized deductions for all three households is an identical \$40,000 due to the capping of SALT deductions at \$10,000. This results in a higher federal tax payment of \$39,966, \$11,970 and \$30,642 in columns 5, 6 and 7 of row 32. Adding these numbers to the 2018 state tax liability results in an effective average state tax rate in 2018 after TCJA of 15.27%, 2.39% and 11.08%. These are the effective 2018 state tax rates (effective18). Comparing the effective18 tax rate to the actual18 average tax rate (the six columns of row 34) yields a delta of 7.99%, 2.39% and 6.11% for New Jersey, Florida and Illinois, respectively (rows 35 ó 37). These is the TCJA bump each state faces.

¹² Note that the changes in Table 3 for New Jersey, Florida and Illinois are not identical to the changes for those states in Table 6. The homeowners in Table 6 are assumed to be identical with incomes of \$500k per year. Table 3 uses the state average adjusted gross incomes for the cohort with incomes greater than \$200k.

¹³ Source IRS 2018 Report of Income database.

Table 6 . Effective Income Tax Rate Δ on Taxpayers with Income = \$500K							
		(2)	(3)	(4)	(5)	(6)	(7)
		Average18	Average18	Average18	Effective18	Effective18	Effective18
row		NJ	FL	IL	NJ	FL	IL
1	Income	500,000	500,000	500,000	500,000	500,000	500,000
2	Home value (= 4 * inc.)	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
3	20% down	400,000	400,000	400,000	400,000	400,000	400,000
4	4.0%						
5	Principal=mortgage	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
6	Allowable mort deduction	1,000,000	1,000,000	1,000,000	750,000	750,000	750,001
7	payment	92,528	92,528	92,528	92,528	92,528	92,528
8	interest	64,000	64,000	64,000	64,000	64,000	64,000
9	Deductible interest	40,000	40,000	40,000	30,000	30,000	30,000
10	Property tax rate (%)	3.89	1.71	3.14	3.89	1.71	3.14
11	property tax	77,800	34,200	62,800	77,800	34,200	62,800
12	Deductible prop tax	77,800	34,200	62,800	10,000	10,000	10,000
13							
14	State tax	36,388	0	24,750	36,388	0	24,750
15	State tax rate	7.28%		4.95%	7.28%		4.95%
16							
17	Deductible State tax	36,388	0	24,750	0	0	0
18	Combined SALT deductions	114,188	34,200	87,550	10,000	10,000	10,000
19							
20	Total Deductions	154,188	74,200	127,550	40,000	40,000	40,000
21	Old Standard Deduction	12,700	12,700	12,700			
22	New Standard Deduction				24,400	24,400	24,400
23	Deduction Taken	154,188	74,200	127,550	40,000	40,000	40,000
24							
25	Income (AGI)	500,000	500,000	500,000	500,000	500,000	500,000
26	Taxable Income	345,813	425,800	372,450	460,000	460,000	460,000
27							
28	Federal Tax Rate	35%	35%	35%	35%	35%	35%
29							
30	Federal tax	121,034	149,030	130,358	161,000	161,000	161,000
31	Federal/State/Local Taxes	235,222	183,230	217,908	275,188	195,200	248,550
32	Combined Diff				39,966	11,970	30,642
33	State tax + Combined Diff				76,353	11,970	55,392
34	Average State Inc. Tax Rate	7.28%	0.00%	4.95%	15.27%	2.39%	11.08%
35	NJ Average18/NJ Effective18				7.99%		
36	FL Average18/FL Effective18					2.39%	
37	IL Average18/IL Effective18						6.13%