

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 for 2019 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 new federal tax law has also altered state personal income tax revenues collections. Using a unique dataset on state personal income tax collections, we find that a state's fiscal year 2019 tax collections came in at a 1.37 percentage point slower rate for each one percent that TCJA raised each state's average effective income tax rate on its highest income earners. We demonstrate that both of these outcomes are being driven by TCJA driving higher net-outmigration. TCJA, a federal tax law change, is motivating net-outmigration of high-income taxpayers to states with low, or no income taxes and altering state income tax revenue collections in ways not considered by the writers of this tax law.

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. 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 (TY).

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 motivated many individuals, even those with lower priced homes to no longer deduct their mortgage payment and instead take the standard deduction. This lowered the federal tax liability for many taxpayers but had the secondary impact of raising state taxable incomes and raising their state tax bill.

Other than taxes, individuals leave a state for a variety of reasons, including crime, weather, family, and better economic opportunities. However, TCJA provides a particularly strong impetus to flee less favorable tax burdens. The contribution of this paper is to detect the initial impact of TCJA on state income tax revenues by analyzing 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 hypothesis that individuals vote with their feet. 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. TCJA is a federal tax law change, but TCJA's second and third order effects have driven changes to state PIT collections. It has done this through: 1) altering the impact of state tax laws (i.e., a lack of state tax conformity plus TCJA passage equals a state tax law secondary effect), 2) increasing net-outmigration from high SALT states (a tax rate secondary effect) and 3) motivating states to change their state income tax laws (a third order effect).

¹ The fiscal year 2019 (FY19) PIT revenues are the tax revenues collected on income earned in tax year 2018 (TY18). We do not include any corporate income tax revenues in this data series. Personal income is earned through wages, interest and dividends and pass through income via proprietorships, partnerships and/or S corporations.

This report is concerned with how TCJA's passage influenced FY19 state personal income tax revenue collections (PIT) through each state's: a) approach to taxations and b) the magnitude of their personal income tax rates.

The outline of this paper is as follows: Section 2 reviews the academic research on the impact of tax rate increases 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). Section 4 discusses tax conformity among the 50 states and Washington, DC. Section 5 presents direct evidence of TCJA's impact on tax revenue collection using recently released data on state income tax receipt changes for fiscal year 2019 (FY19). Section 6 contains empirical evidence showing that tax rates, not economic conditions have 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 tax year 2018 (TY18).

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.

² Net-outmigration = outmigration-inmigration.

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 marginal tax rates are associated with small but significant effects on net out-migration from the 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 "millionaire" 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 millionaire's taxes in California and New Jersey. 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 σ in the private sector as well as academia and government σ 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

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.

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.

Lastly, Haidorfer and Sussman (2020) 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 100 of these high-income earners per 100,000. This is a long-run stock elasticity of 0.10 across 50 states and DC. We also demonstrate that the yearly impact of a tax increase jumps by about 20% in the first year of the tax rate increase and then stays constant. The impact does not burn itself out within the 5 years for which we have data.⁴ These results, across time, come from historical IRS net-outmigration rates that followed an income tax increase in the states of Maryland, Connecticut, Illinois, Kansas and Minnesota during the years 2012 to 2018.

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. How strong is the long-run impact of a 1% increase in a state's income tax rate on net-outmigration (the elasticity)? Academic results for a change due to an income tax rate change, vary from 0.03 to 0.50 depending upon the researcher and the cohort analyzed. The related issue is how do these elasticities change overtime? 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. At this juncture we argue that the impact of a tax increase jumps sharply in the first year of the tax increase and does not burn itself out even after five years. In this paper, we are just concerned with TCJA's impact the first year (FY19).

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.⁵ These two changes (MID and SALT) make homes less attractive to new home buyers and cause taxpayers to

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 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.

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 home price change as a proxy for migration behavior. A reduction in the incentive to own an asset (through higher taxes) should cause the demand for that asset 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.⁶ Our first sample is home price appreciation (HPA) on 16 CBSAs from Case-Shiller. The second is from Zillow.com.

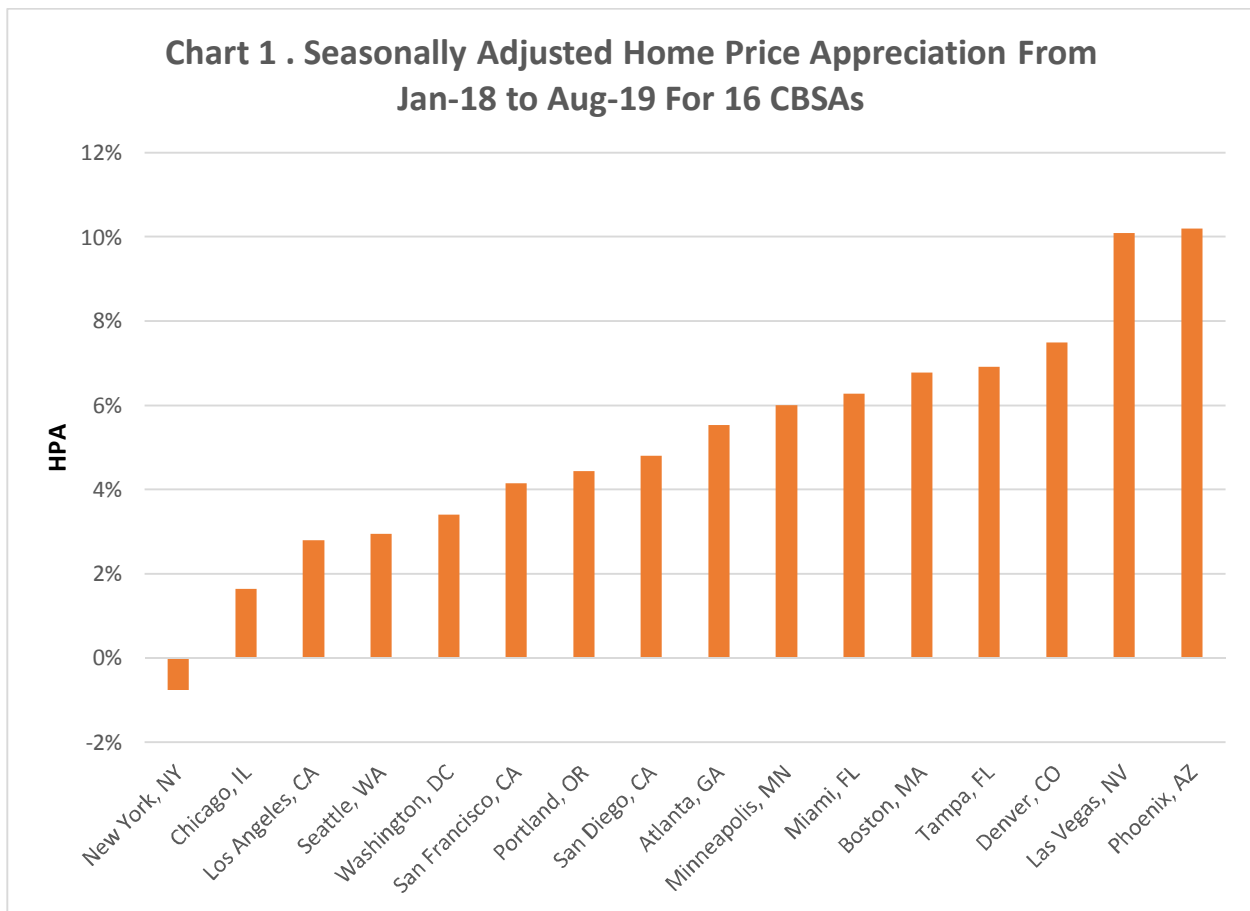
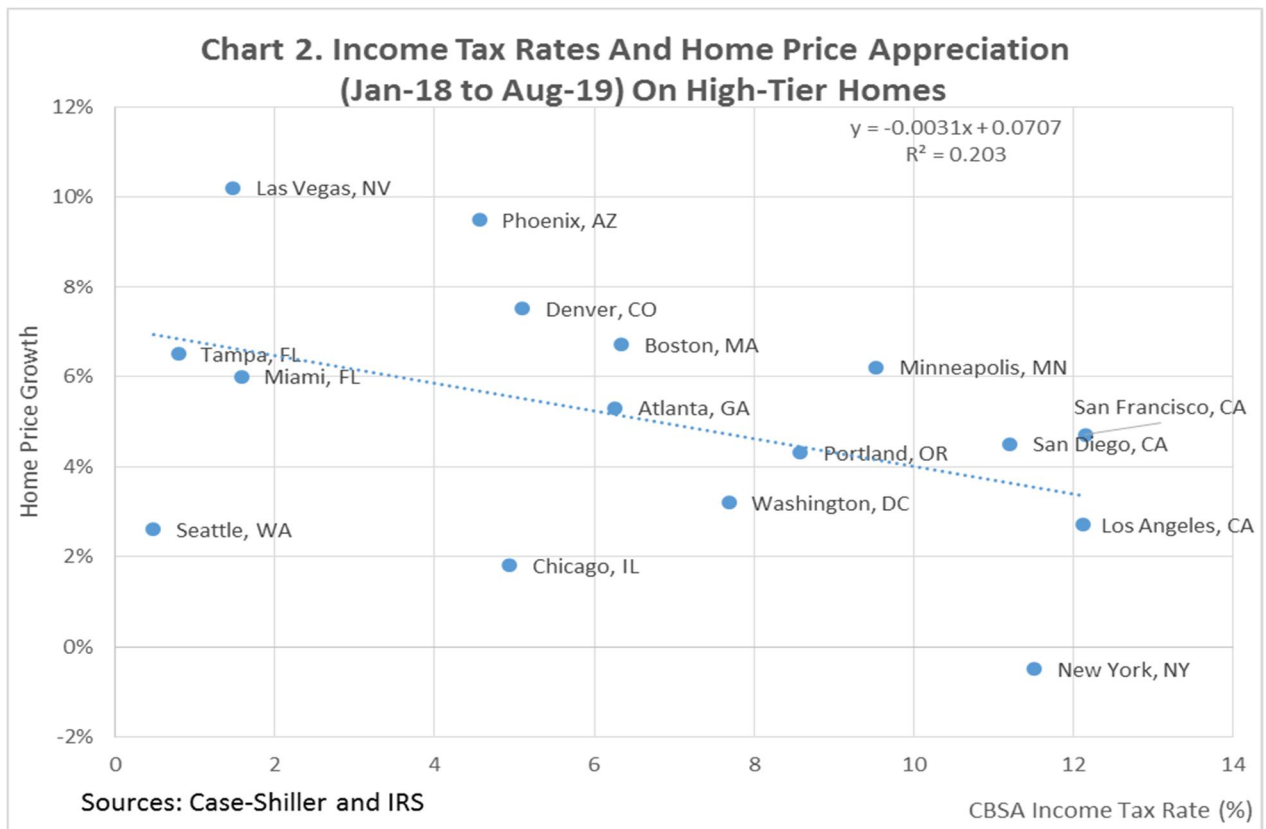


Chart 1 shows Case-Shiller seasonally adjusted home price appreciation (HPA, SA) data for 16 CBSAs. Case-Shiller further breaks homes into high, mid, and low-tier home prices for those 16

⁶ 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 is also symptomatic of taxpayers leaving the state. This could be in the form of declaring primary residence in another state.

CBSAs.⁷ 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 TCJA 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.

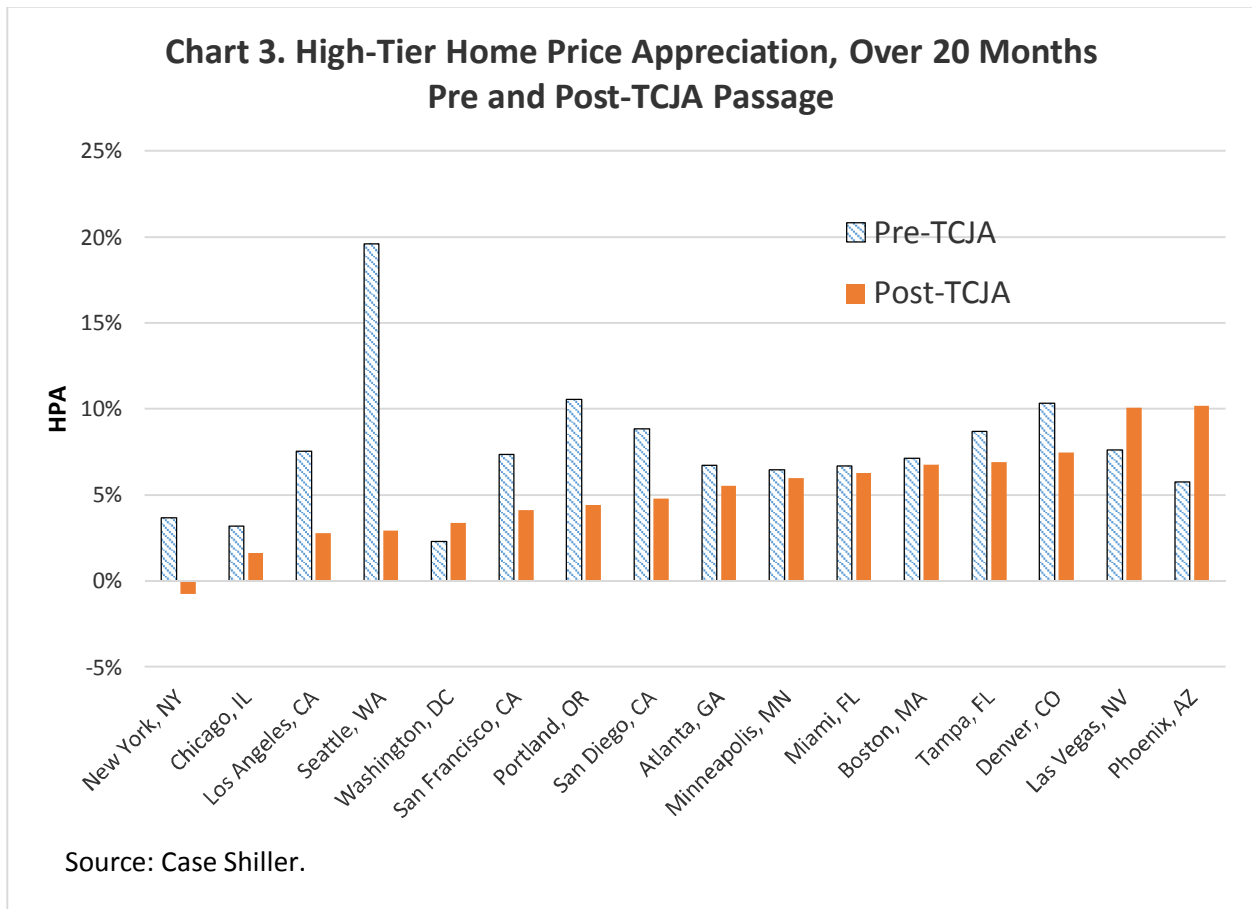
Charts 2 and 3 offers one possible cause. In Chart 2 home price appreciation has slowed where taxpayers are paying higher income tax rates. Since the enactment of TCJA, the amount of these state income taxes which can be deducted from a household's federal tax bill has been capped. Potential property 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. 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

⁷ Case-Shiller track home prices for 20 CBSAs on a monthly basis.

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-outmigration 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 lower 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 aggregate income for all 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.

		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. State tax conformity

TCJA has driven changes to state PIT collection through altering the impact of state tax laws. Below we show how a lack of state tax conformity and TCJA passage has resulted in state tax law driving uneven growth in state FY19 income tax revenues ó a secondary effect of TCJA

4.a Background

Each state has its own approach to taxationó its own combination of tax types, rates and structures, and rules and exemptions. These variations reflect a multiplicity of purposes and an array of fiscal aims, some with contemporary urgency and others lost to the ages. Yet even the most iconoclastic

state tax structures draw upon the federal tax code, and the Tax Cuts and Jobs Act has ramifications for those tax structures to which, even more than a year out, states have not fully adapted. This section is concerned with how each state's approach to taxation has influenced how federal tax law changes (i.e., TCJA) have driven state personal income tax revenue collections in fiscal year 2019.

Data on federal taxes paid in FY19 by U.S. citizens in each state are not yet available from the IRS. In March 2018, Cushman and Wakefield estimated that TCJA reduced the aggregate federal tax liability of California residents more than residents of any other state in absolute terms: \$33.3B in 2019.⁸ This means that if one adds up the federal tax bills of all California households under TCJA and then compares the total to what it would have been under the previous law the bill for FY19 would be \$33.3B lower. Texas, Florida and New York will receive the next largest reductions. However, residents in the higher tax rate states will see a smaller reduction in their taxes relative to the incomes; consequently they will bear a larger share of the federal tax burden than they had previously. At the individual level it is estimated that 84% of taxpayers have seen their federal tax bill decline in 2019. TCJA is a federal tax law, but it has had major repercussions also on state tax revenues.

State personal income tax revenue collections for FY19 were recently collected by the Center for Housing Risk Research. The data show that state personal income tax revenue collections went up on average by about 6.3% (i.e., many taxpayers saw their state income taxes go up) over FY18. Absent some sort of policy response, most states saw this increased revenue due to federal tax reform, with expansions of the tax base reflected in state tax systems while corresponding rate reductions failed to flow down. The extent to which this has been true (and indeed in some cases, is not completely true) depends on the federal tax provisions to which a state conforms (tax conformity) and the fact that some states also faced increased net-outmigration of their highest income earners due to the motivational aspect of higher effective income tax rates.

4.b.0 State Conformity Breakout

Although each has its own additions and subtractions, twenty-nine states and the District of Columbia use federal adjusted gross income (AGI) as their starting point for calculating individual income tax liability. Another six states (Colorado, Idaho, Minnesota, North Dakota, Oregon, and South Carolina) use federal taxable income (FTI). The remaining six states which tax wage income (Alabama, Arkansas, Massachusetts, Mississippi, New Jersey and Pennsylvania) use state-specific definitions (state). Lastly New Hampshire and Tennessee place a tax only on interest and dividends. Seven states do not tax earned income.

Complexity expands as we go from federal rules to state tax rules, and how these rules play out as changes to each state's PIT revenue collections going forward. One important issue is how a state's standard deduction usage conforms to federal standard deduction usage. In many states if a taxpayer took/takes the larger standard deduction mentioned above on their federal returns in 2018, it did not/does not have a bearing on whether that taxpayer could itemize versus take the state standard on their state tax return. Most states do allow itemized deductions regardless of the decision on deductions at the federal level. Twelve states and Washington, D.C., however, will allow you to itemize on your state tax return only if you itemize on your federal return. This has

⁸ Cushman & Wakefield "Tax Reform in High SALT States" March 2018.

implications on how personal income tax collection revenues to each state have changed in FY19 and will change in the years beyond from prior years. Those 12 states are Colorado, Georgia, Kansas, Maine, Maryland, Missouri, Nebraska, North Dakota, Oklahoma, South Carolina, Utah and Virginia. It is important to point out that 10 of these 13 geographies use AGI as the starting point and three states (Colorado, North Dakota and Utah) use FTI.

TCJA also removed the personal exemption at the federal level. Six states (Colorado, Idaho, Missouri, New Mexico, North Dakota, and Utah) saw the elimination of their personal exemption due to the new federal law. Three of these states (Colorado, Idaho, and North Dakota) adopted the new standard deduction and eliminated the personal exemption by virtue of their use of federal taxable income as an income starting point. The other FTI states retain their exemptions, either because they conform to a prior year's IRS tax code (Minnesota) or because they expressly decoupled from federal treatment of the personal exemption (Oregon and South Carolina). In Missouri, a somewhat ambiguous statute was clarified (to affirm the personal exemption's elimination) as part of a broader package of tax reform facilitated, in part, by the new federal law.

In response to the federal tax law changes above and the higher state taxes that taxpayers in their state would pay in FY19 (i.e., the mirror image of higher state tax revenue collections), six states modified their state's tax code in 2018. Thus in addition to the TCJA explicit changes to the federal tax codes mentioned above we need to consider the subsequent state response, and lastly the impact state marginal tax rate have on net-outmigration of their highest income earners. High net-outmigration of the highest income earners would act to depress tax revenue collections. In essence, TCJA directly impacted federal tax returns, but also caused measurable second and third order impacts to almost every state's PIT revenue collection. We might therefore think that each state has four moving pieces that could explain their PIT changes in FY19 and subsequent years: 1) their economy, 2) how each state defines state tax liability (i.e., tax conformity), 3) each state's subsequent response and 4) their marginal income tax rates. We address tax conformity in Sections 4.b.1 through 4.b.5. We then discuss modifications to the state tax codes by seven states in Section 4.c and then the impact of federal changes via TCJA in Section 5.

In order to understand state tax conformity and TCJA's impact on state income taxes we block 43 states and Washington, DC into five different state cohorts:

4.b.1 (state-defined)

There are six states which tax wage income that use state-specific definitions of income, although they incorporate some IRS tax code (IRC) provisions into these definitions. These six states again are Alabama, Arkansas, Massachusetts, Mississippi, New Jersey and Pennsylvania. Because they rely the least on IRC, they are likely to be the states least impacted by TCJA (labelled in the Chart 4 below as state).

4.b.2 (AGI, SD=Fed)

A state electing AGI as a starting point for its definition of income tax liability means that the definition of taxpayer's income liability has not been directly impacted by TCJA. However, TCJA's impact on state tax revenue collections filter down in other ways. Nine AGI states and the District of Columbia require that if a taxpayer takes the standard deduction at the federal level, the taxpayer must take it at the state level (labelled in Chart 4 as AGI, SD=Fed). TCJA increased the

federal standard deduction, which resulted in more taxpayers taking the standard deduction rather than itemizing deductions at the federal level. On average, taxpayers who itemize at the state level pay a lesser share of their income in PIT than those who take the standard deduction. As a result, the average taxpayer who switched from itemized deductions to the standard deduction paid more in state PIT. In prior years about half of Maryland taxpayers took itemized deductions, in TY 2018 only a quarter did. Generally, switching to the standard deduction meant lower refunds or sometimes a final payment for those taxpayers. These nine states most likely witnessed state PIT collections in FY19 going up relative to FY18 more than the other AGI states. It should be pointed out here that three states use federal taxable income as the starting point also incorporate the federal standard deduction rule (Colorado, North Dakota and Utah). These three states will be discussed below.

4.b.3 (AGI)

Twenty-nine states and the District of Columbia use federal adjusted gross income (labeled AGI) as their starting point for calculating state individual income tax liability. For these states, TCJA changes do not impact the starting point to calculate an individual's state income tax liabilities. As noted above, however, 9 states and DC start with AGI and also require their taxpayers to use the standard deduction at the state level when they use it at the federal level. This leaves 20 AGI states in which taxpayers are free to itemize their deductions at the state level even if they take the standard deduction at the federal level. The impact of TCJA on tax revenue collections in these 20 states is not easy to predict. Moreover, many of the states with the highest marginal income tax rates fall into this cohort (including New York, Connecticut and California). TCJA changes to the tax codes states exaggerates the impact each state's marginal tax rate has on net-outmigration. These states may see state PIT collections in FY19 go up or down relative to FY18.

4.b.4 (FTI)

Six states (Colorado, Idaho, Minnesota, North Dakota, Oregon, and South Carolina) use federal taxable income. A state electing FTI as a starting point for state income taxes has the effect of incorporating federal standard and itemized deductions and a new deduction for qualified pass-through business income, unless the state expressly decouples from these provisions. Since the federal personal exemption (FPE) now set at \$0, is also an element of federal taxable income but not federal adjusted gross income, states which begin with federal taxable income incorporate the elimination of the personal exemption unless they expressly decouple from the provision, while for other states, the implications of federal repeal vary depending on how state statutes are written. Three of states that use FTI as the starting point retained their personal exemption (Minnesota, Oregon and South Carolina). Eliminating the personal exemption at the federal broadens the tax base considerably more than raising the standard deduction narrows it, we would expect to see state tax revenues go up more in the FTI states than the AGI and state-define states. The net results for these three states (labelled as FTI in the chart below) from increasing the standard deduction at the federal level and retaining the personal exemption at the state level means a wider tax base than the AGI states, and narrower tax base than the other FTI states.

4.b.5 (FTI, SD=Fed, FPEe)

Two of the six states above which use FTI as the starting point for income tax liability also mandate that if taxpayers take the federal standard deduction that they must also take the standard deduction on state calculations and along with Idaho have simultaneously in 2018 have lost the federal

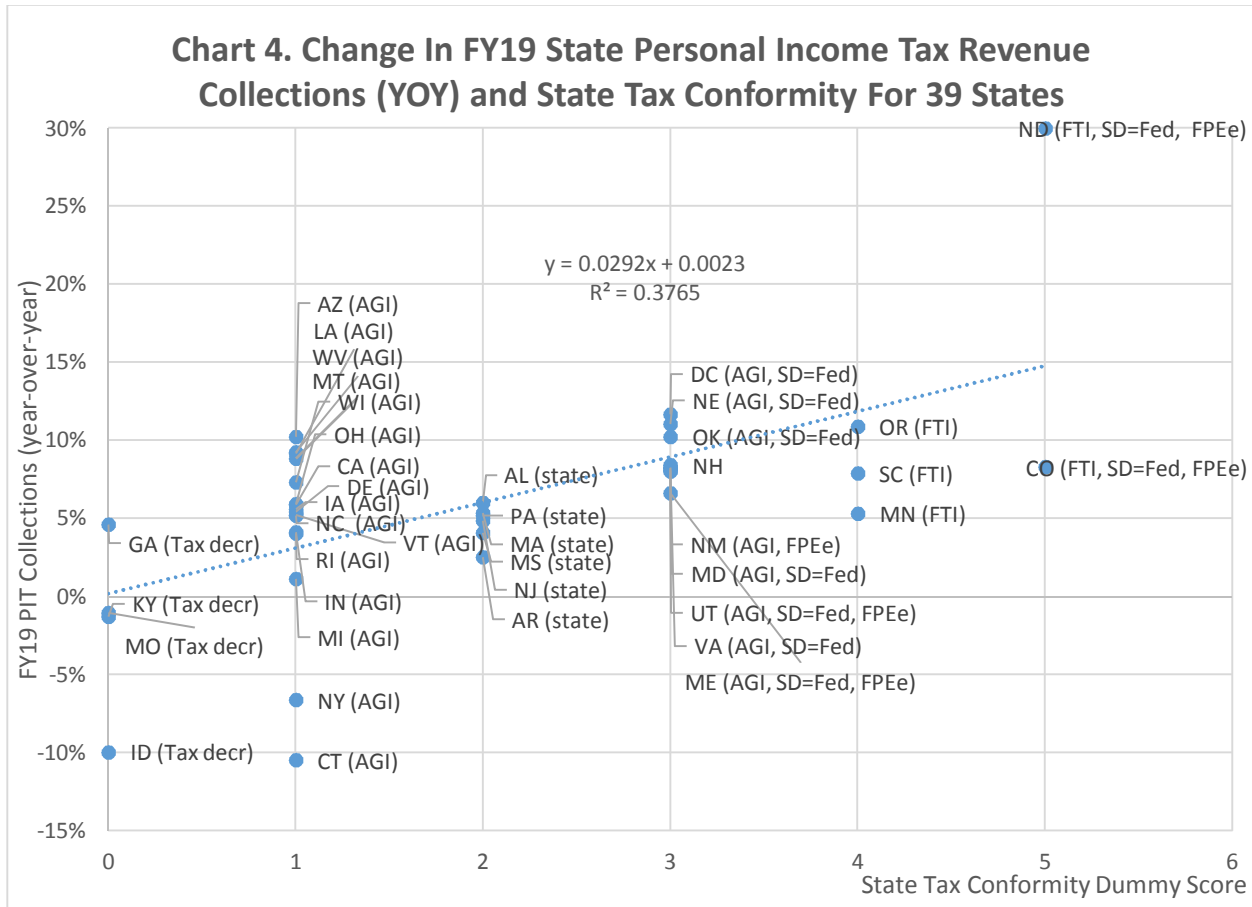
personal exemption and consequently the state personal exemption (i.e., the state personal exemption has been eliminated, labelled as FPEe in Chart 1). These two changes mechanically bring more taxes into those state coffers. We consequently put Colorado, Idaho and North Dakota into a fifth category. Eliminating the federal personal exemption broadens the tax base considerably more than raising the standard deduction narrows it, we would expect to see state tax revenues go up even more in these three FTI states than other states.

4.c. State responses (Tax decr)

Recognizing that there are other moving pieces, does not change the fact that for most states, the tax base is broader after federal tax reform, forcing states to decide whether to keep the additional revenue to grow government, cut rates to avoid an automatic tax increase, or use the broader base to help pay down broader tax reform. In 2018, seven states— Georgia, Idaho, Iowa, Missouri, Utah, Kentucky and Vermont— adopted rate cuts or other reforms designed, at least in part, as a response to the expectation of increased revenue due to federal tax reform. Their distinct approaches pattern a range of options available to other states. These were:

- In Georgia, lawmakers reduced the top individual and corporate income tax rates from 6 to 5.75 percent in 2019 while doubling the standard deduction. Further rate reductions, to 5.5 percent on both taxes, are anticipated for 2020, but will require a joint resolution affirming the legislature's continued assent. The bill was signed into law on March 2, 2018.
- Idaho implemented a 0.475 percentage point cut in the corporate income tax rate and across all marginal individual income tax brackets in 2018 and introduced a new child tax credit to offset additional revenue associated with federal tax conformity. The child tax credit was created to account for the impact of the loss of the personal exemption for larger families. The law passed in June 2018.
- Kentucky in April 2018 replaced the individual tax brackets with a single 5 percent tax rate. Previously Kentucky had tiered brackets of 5, 5.8 and 6 percent. To offset the flat tax rate, lawmakers eliminated a number of individual deductions, including those for health insurance coverage and medical expenses. Although there are fewer options for itemized deductions, the standard deduction remains at \$2,530.
- In Missouri, the top individual income tax rate was cut from 5.9 to 5.4 percent, partially offset by a phase-out of high earners' federal deductibility, and a corporate rate cut is set to follow in 2020. As in Iowa, a broader tax package was facilitated in part by federal conformity revenue, particularly since the state conformed to the repeal of the personal exemption. The new tax rate became effective January 1, 2019.
- Utah shaved its individual and corporate income tax rates from 5.0 to 4.95 percent and approved an expansion of the child tax credit to offset additional revenues expected from tax conformity. The law became effective January 1, 2020.
- Vermont eliminated its top individual income tax bracket and reduced the remaining marginal rates by 0.2 percent across the board.
- A broader tax reform package advanced in Iowa, helped along by projected conformity revenue. Over the course of several years, Iowa's top individual income tax rate will fall from 8.98 to 6.5 percent, while the corporate income tax rate will decline from 9.8 percent. The tax package includes the repeal of the alternative minimum tax as well as the phase-out of Iowa's unusual deduction for federal taxes paid. The law passed on May 30, 2018, but its gradual introduction means its impact was not felt in FY19.

Four of those seven states (Idaho, Georgia, Kentucky, and Missouri) appear on Chart 4 as states with a decrease to their state income tax rates (dummy value equal to zero). The tax changes for Vermont, Iowa and Utah apply to FY20.



5. The impact on FY19 state income tax revenue collection

TJCA is a federal tax law change, but its second order effects have driven changes to state tax revenue collections through motivating high-income taxpayers to migrate out of the state

5.a State income tax revenue collection data

We are looking for the impact TCJA had on TY 2018 tax collections which would show up in FY19 PIT collections over FY18 collections. As we will highlight in Table 3, we are using calculated average state tax rates from 2017 and only want states in our sample whose tax rate structure remained unchanged from 2017.

Four states altered their tax rate structure in 2017:

- 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 expired in December 2015.

- 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.
- Kansas increased its state income tax in 2018 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.
- 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% on January 1 in 2018.

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	Average			Marginal	Average
1	Alabama	5.00	4.14	27	Nebraska	6.84	6.55
2	Alaska	0.00	0.24	28	Nevada	0.00	1.95
3	Arizona	4.54	4.57	29	New Hampshire	2.00	2.05
4	Arkansas	6.90	5.91	30	New Jersey	8.97	8.83
5	California	12.30	12.19	31	New Mexico	4.90	4.67
6	Colorado	4.63	5.22	32	New York	8.82	12.26
7	Connecticut	6.99	8.87	33	North Carolina	5.50	6.26
8	Delaware	6.60	6.98	34	North Dakota	2.90	2.28
9	Florida	0.00	1.41	35	Ohio	5.00	5.64
10	Georgia	6.00	6.25	36	Oklahoma	5.00	4.55
11	Hawaii	11.00	8.08	37	Oregon	9.90	10.00
12	Idaho	6.93	7.88	38	Pennsylvania	3.07	5.12
13	Illinois	4.95	4.89	39	Rhode Island	5.99	7.06
14	Indiana	3.23	5.63	40	South Carolina	7.00	6.00
15	Iowa	8.98	6.82	41	South Dakota	0.00	0.89
16	Kansas	5.70	5.30	42	Tennessee	3.00	1.07
17	Kentucky	6.00	7.38	43	Texas	0.00	0.46
18	Louisiana	6.00	4.27	44	Utah	5.00	6.35
19	Maine	7.15	8.28	45	Vermont	8.95	7.87
20	Maryland	5.75	9.60	46	Virginia	5.75	6.45
21	Massachusetts	5.10	6.41	47	Washington	0.00	0.70
22	Michigan	4.25	5.02	48	Washington, DC	8.95	9.59
23	Minnesota	9.85	9.71	49	West Virginia	6.50	7.03
24	Mississippi	5.00	4.80	50	Wisconsin	7.65	7.12
25	Missouri	5.90	6.61	51	Wyoming	0.00	1.71
26	Montana	6.90	6.89				

Source: Marginal tax rate is from each state's department of revenue, average is from IRS 2017 data

Table 3. Impact Of TCJA on Average State Income Tax Rates (incomes > \$200K)									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		State Avg Income Tax Rate					State Avg Income Tax Rate		
	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.

These four states were dropped from our sample because we are trying to circumvent any changes in 2018 net-migration caused by individual state 2017 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 40 markets in which income tax rates were static from the prior two years.

We need first to know each state's individual income tax rates. There are two approaches. Table 2 shows two ways of assessing each state's income tax rate. The first is the marginal tax rate of 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 2017. We can easily obtain state marginal tax rates for the highest income bracket, but these do not reflect what taxpayers actually pay.

A second approach is to calculate average tax rates. In columns 4 and 8 of Table 2 are calculated average state and local income tax rates for citizens living in that state. The "Average" 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 aggregate income of taxpayers in that income bracket in the year 2017. It includes local taxes

because they have to be paid also. These IRS tax rates are calculated averages from the IRS 2017 database. Again, they include income taxes paid to both the local jurisdiction and the state.

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 difference between the average and the effective is the delta. This is the effective impact to the income tax rate taxpayers in each state now have to face. Since some taxpayers in states which have a zero state income rate pay some local taxes, the calculated average and effective state tax rates show up with small positive values due to the local income taxes paid. They are not stated marginal rates. 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.

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

To measure the impact on PIT 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.

Table 4. Personal Income Tax Revenue Collection YOY Change					
	State	YOY Change		State	YOY Change
1	Alabama	0.059	21	Montana	0.085
2	Arizona	0.097	22	Nebraska	0.105
3	Arkansas	0.025	23	New Hampshire	0.081
4	California	0.057	24	New Jersey	0.048
5	Colorado	0.080	25	New Mexico	0.079
6	Connecticut	-0.111	26	New York	-0.069
7	Delaware	0.053	27	North Carolina	0.051
8	Georgia	0.045	28	North Dakota	0.273
9	Idaho	-0.105	29	Ohio	0.058
10	Indiana	0.041	30	Oklahoma	0.097
11	Iowa	0.054	31	Oregon	0.103
12	Kentucky	-0.013	32	Pennsylvania	0.051
13	Louisiana	0.088	33	Rhode Island	0.039
14	Maine	0.064	34	South Carolina	0.076
15	Maryland	0.077	35	Utah	0.078
16	Massachusetts	0.052	36	Vermont	0.051
17	Michigan	0.011	37	Virginia	0.079
18	Minnesota	0.052	38	Washington, DC	0.110
19	Mississippi	0.040	39	West Virginia	0.088
20	Missouri	-0.011	40	Wisconsin	0.071

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

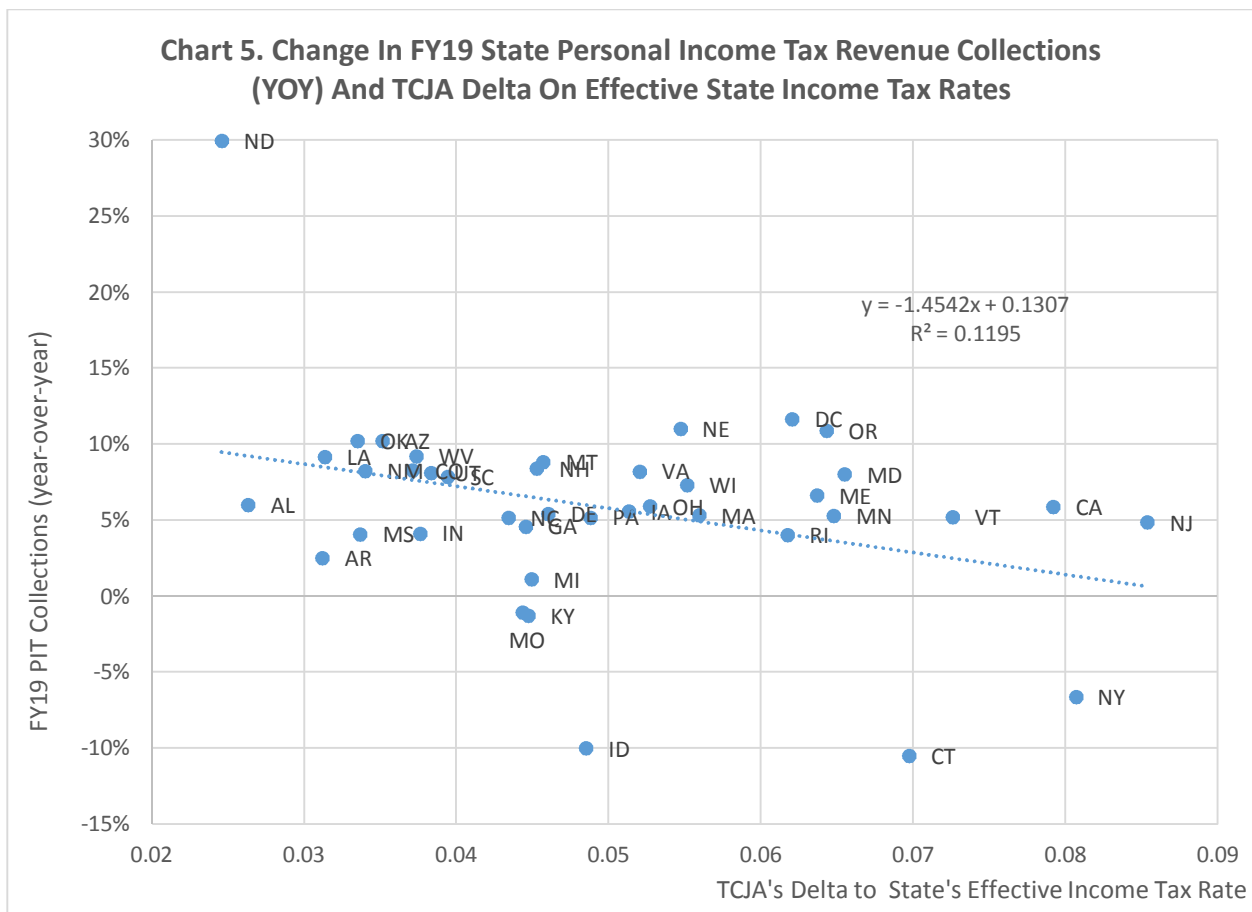
We notice in Table 4 that the collection of personal income tax revenue declined for several states while most others increased in FY19. We noted in Section 4 that some states lowered their personal income tax rate in 2018 as a way to mitigate anticipated higher tax payments by their citizens. It

is true that the local economy in each state varies and some states have more high-income taxpayers, but in this section we are considering the effect of each state's income tax rate on the location decision of its highest income earners. Here we use the IRS's cutoff of incomes greater than \$200k to define high-income.

In Chart 5, we plot the TCJA deltas (the change in the 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) for 39 states and Washington, DC.

In that chart we see a number of important facts:

1. The YOY PIT changes averaged a positive 6.1 percent for the 40 geographies. If we ignore North Dakota, Idaho, New York, California, New Jersey and Connecticut in Chart 5 we could say that states were not impacted by TCJA. There does not seem to be much of an 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 delta 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.



2. Overall, the relationship between income tax revenue growth in FY19 and the TCJA delta 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.⁹ These high-income migrants must have organized themselves during the year prior to passage. This raises the question of burnout.¹⁰

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? Maryland and Washington, DC mandate taking the standard deduction at the state level if a taxpayer is taking it at the federal level. This has meant higher income tax receipts. Anecdotal evidence also suggests that some financial firms prominent in 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 standout. It has the highest TCJA delta due to its high income and 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? Chart 4 shows that New Jersey uses a state-defined measure of state income tax liability. Essentially, PIT revenues came in stronger in New Jersey (versus New York, or Connecticut) because its citizen's personal income tax liability is state defined and was not directly impacted by TCJA. Thus even though TCJA has impacted New Jersey's high income and property tax rates by raising its effective income tax rate and motivating high-income taxpayers to leave the state this second-order effects is being offset by another second-order effect.

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

To investigate the proposition that TCJA drove changes in states' personal income tax (PIT) revenue collections from FY18 to FY19 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. In Equation 1 we include the values from Chart 4 on state tax conformity as a dummy variable (CONFORM) to control for individual state tax laws. We also include the impact of the economy and the change to the effective income tax rate (DELTA from Table 3).

⁹ 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.

¹⁰ This issue is dealt with extensively in Haidorfer and Sussman (2020)

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.

increase in personal income tax revenues collections in FY19. The coefficient β_4 is our income tax rate elasticity (ϵ_r^{PIT}). The value of -0.92 indicates that for every 1% higher a state's income tax rate was higher than others in TY18, the state's FY19 PIT came in lower by 0.92%.

Specification 2 in Table 5 suggests that the impact of a state's income tax rate on income tax revenue collections is linear as each state's slower tax revenue gains depend upon the magnitude of that state's combined 2018 SALT taxes in equal steps. However, we also note from Chart 5 that at an income tax revenue delta of about 7 percent, PIT tax revenues came in lower than average, or sometimes even declined. We argue that for those states with a stated marginal income tax rate greater than 9 percent in 2018 (corresponding to a delta of at least 7 percent) net-outmigration of high-income taxpayers has become high enough to cause total state PIT revenue collection to shrink very quickly from the previous year. It could be that the effective income tax rate in high-SALT states like Connecticut and New York (exacerbated by TCJA) have reached a level such that net-outmigration of high-income taxpayers has been tipped past the point whereby PIT revenues fall in a non-linear fashion. We do not have enough observations on PIT to prove this non-linear hypothesis. Onerously for high SALT states, the TCJA delta is not going to go away and evidence indicates the resulting net-outmigration change, every year, each year, slows down only slightly, but also never goes away.

7. 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.

In this paper and an earlier paper, we are trying to answer six important questions:

1. How much does net-outmigration of high-income taxpayers 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 much has TCJA altered state income tax revenue collections through state tax conformity?
4. How much has TCJA raised effective personal income tax rates?
5. How much has TCJA altered high SALT states' income tax revenue collections in FY19 through net-outmigration of high-income taxpayers?
6. Most importantly, is there a tipping point at which higher state income taxes raise net-outmigration so high that a state's personal income tax collections decline?

In looking at prior research and the results of this paper, 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 100 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 empirical averages across geographies. They are

long-run outcomes. Our research covers households making more than \$200k per year in 2012-2018 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 five states that have raised their income tax rates at least once during 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 five 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. There is only slight burnout -- net-outmigration remains elevated at least five years after the initial shock (see again Haidorfer and Sussman (2020)).
- 3) **State tax conformity and income tax revenue collections:** Many individuals in America paid less federal taxes in 2018 than they did in 2017, a beneficial outcome, all else held equal. However, some individuals paid less federal taxes but more state income taxes. This is good for the state and bad for taxpayers. The point is that TCJA impacted not just federal income tax collections, but also state income tax collections.
- 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 Table 6 in the Appendix).
- 5) **Federal tax changes and income tax revenue collections:** TCJA has raised 2018 effective income tax rates for all states that have an income tax. Using an unique dataset on recently released FY19 state personal income tax revenues we have estimated an elasticity on the TCJA interest rate delta (Δ^{PIT}) equal to -1.37. Thus empirically, according to our linear specification, for every one percentage point that TCJA has raised the effective state income tax rate on its highest income earners, we show that a state's personal income tax revenue collections from all taxpayers (high and low income combined) came in at a 1.37% slower rate.
- 6) **A tipping point:** Inspection of Table 3 and Chart 5 indicates that tax revenues gains become significantly slower than average once a state's average personal income tax rate (state and local combined) is greater than 9 percent (corresponding to a TCJA caused delta of 7 percent).

It was anticipated that TCJA would penalize states that have high income tax rates while changing little for states that have no income tax. By increasing the effective tax rate in high SALT states it is hastening net-outmigration. Although we do not have net-outmigration data for 2019 to prove this hypothesis, we show that home price growth is faltering and that FY19 income tax revenue collections have weakened more in states where taxpayers previously enjoyed high SALT deductions. 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. What was not anticipated, however, is that taxpayers in many low SALT states would also have to pay higher state income taxes in FY19, and that each state would have to adjust their individual tax laws to mitigate the pain to their citizens and remain tax-rate competitive.

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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%