

Income Tax Cuts and Household Finance: Evidence from 2017 Tax Reform

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Abstract

How did individual income tax cuts affect the utilization and performance of consumer credit following passage of U.S. tax reform legislation in 2017? We study this question using census-tract-level variation in tax changes following tax reform and a detailed panel of consumer credit data. We find that tax cuts resulted in lower utilization of consumer credit, particularly in credit cards and mortgages. In addition, we find improved loan performance with fewer delinquent accounts and a lower probability of delinquency, particularly in auto loans. These results suggest that tax reform had material effects on household financial positions overall.

Keywords: Individual income taxes, tax cuts, household debt, household finances

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I. Introduction

In December 2017, the U.S. Congress passed the law commonly known as the Tax Cuts and Jobs Act of 2017 (TCJA), enacting the largest changes to the individual and corporate income tax codes since tax reform legislation was previously passed in 1986.¹ Reductions to individual income tax rates were a cornerstone of the legislation. Given that a substantial fraction of U.S. households had little-to-no federal tax liability prior to passage, however, the likely effects of the legislation on a household financial positions broadly was unclear. In this paper, we investigate how the reduction in individual income taxes enacted under the TCJA affected the utilization of consumer credit as well as credit performance.

Lower individual income taxes increase the level of disposable income available to consumers. This new-found disposable income might be used for consumption, thereby stimulating aggregate demand. The new disposable income might be coupled with debt financing for larger purchases like durables. On the other hand, consumers might save some of those funds, whether directly or by paying down existing debt. As such, the theoretical prediction on the effect of tax cuts on consumer debt take-up is ambiguous.

With payment delinquency, though, the prediction is clearer. Increased disposable income means that individuals have a greater ability to pay; given that missing payments yields costly fees, additional interest accrual, and higher interest rates on loans (both for current loans, in the case of penalty-interest rates for credit cards, and for any new loans via lower credit scores), individuals face a strong incentive to use the income to help keep their loans current and stay out of delinquency.

¹ H.R. 1: “An Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018.”

That said, these consumer responses assume some awareness of the increased disposable income available to them with new tax regime. The IRS changed income tax withholding tables quickly after the implementation of TCJA, leading to small, but immediate changes to disposable income smoothed across pay periods, in contrast to tax rebates that increase disposable income in a more salient lump sum.² These small changes in take-home pay may not necessarily have been salient to workers. Indeed, multiple public opinion polls showed that few people believed they owed less in taxes under the TCJA, in contrast to the majority of taxpayers who paid less in taxes than they would have in the absence of the TCJA (Tax Policy Center, 2019).³

There is substantial heterogeneity in the magnitude of tax changes across taxpayers. Tax reform was enacted at the federal level, but the magnitude of tax changes varied substantially across geographies depending on local household incomes and housing prices particularly, as well as the interaction between federal and state tax law provisions.

To identify the effect of the TCJA’s individual income tax cuts on household credit behavior, we leverage this heterogeneity by constructing representative tax rate changes by census tract and match them to a large panel of consumer credit data. To construct the representative tax rate changes, we first collect data on median household incomes, median worker incomes and median housing prices for 2017. Next, we calculate the change in the average effective tax rate by census tract—the federal plus state tax rate—under the post-TCJA tax code compared to the pre-TCJA tax code, using a detailed microsimulation model of the U.S. tax code provided by the

² The new income tax withholding tables were announced on January 11, 2018, and employers were required to use the new tables by February 15, 2018.

³ Wall Street Journal/NBC News: “17% of respondents said they are paying less in taxes under the new law”; Reuters/Ipsos: “21 percent of adults who had either filed their taxes or planned to said “the new tax plan that Congress recently passed” would let them pay less this year”; Gallup: “14% say their taxes have gone down because of new tax laws”.

National Bureau of Economic Research. As we use data observed prior to treatment by the TCJA, this tax change can be considered the exogenous component of new tax law provisions at the local, census tract level.

We study the effect of individual tax cuts on consumer credit utilization and loan performance: changes in the number of loans outstanding across products (auto loans, credit cards and mortgages) and changes in the number of delinquent accounts and the probability of delinquency across products. We find the tax cuts had modest effects on the take-up of household credit and moderate effects on credit performance. In the four quarters following the TCJA, we find that households reduced the number of auto loans, mortgage loans, and credit card accounts outstanding. We also find the tax cuts had a material effect improving loan performance, particularly the performance of auto loans. We find a reduction in the number of delinquent auto loans and the probability of having a delinquent auto loan. We find no statistically significant effect on the performance of credit cards or mortgages. We also find no effect on borrower's overall credit score. This result is consistent with the offsetting credit-score effects of improved loan performance but lower credit utilization.

We contribute to literatures studying 1) how tax law changes affect household incomes, consumption, and finances and 2) drivers of changes in household financial positions. A number of papers have analyzing the effects of income shocks arising from tax (or other fiscal) policy changes have shown that consumers react both by changing consumption, which might be financed by additional debt, as well as by paying down existing debt. In a study of Singaporeans, consumers reacted to the announcement of an unexpected exogenous income shock by increasing their spending, primarily using credit cards (Agarwal and Qian, 2014). Agarwal, Liu, and Souleles (2007) and Sahm, Shapiro, and Slemrod (2010) find evidence that borrowers use tax rebates to pay

down debts. Tax rebates are typically lump sum increases to income, whereas the TCJA yielded increases to income via reduced income tax withholding, which may have been less salient to consumers than a rebate.

Minimum wage increases, though, generate more incremental changes to income. Dettling and Hsu (2017) show that higher minimum wages are associated with greater access to low-cost credit, as well as reduced payment delinquency. Aaronson, et al. (2012) find that minimum wage hikes lead to greater spending on durables, often debt-financed. These effects hold in spite of the incremental accrual of increased income arising from such policy changes, though for the low-income populations targeted by these policies, even small changes in income can have large impact.

In the context of a unemployment insurance, which (partially and temporarily) replaces income streams lost due to job loss, and families further up the wealth distribution, Hsu, Matsa, and Melzer (2018) show that more-generous unemployment insurance helps homeowners avoid mortgage delinquency and foreclosure. In contrast to TCJA withholding changes, though, unemployed workers, particularly homeowners, are likely very aware of the unemployment insurance benefits they receive.

Our paper contributes to this literature as the only study, to our knowledge, analyzing the impact of this recent tax reform on household credit behavior. We analyze a tax reform that generated gradual changes to take-home income, with relatively low levels of salience for taxpayers. Our findings can speak to the extent to which individuals' financial behavior responds to low-salience changes to their income.

The remainder of the paper proceeds as follows. We present background information on the TCJA in Section II, discuss the empirical strategy and the dataset in Section III, present the results in Section IV and conclude in Section V.

II. Policy Background: The Tax Cuts and Jobs Act of 2017

The TCJA made considerable changes to the U.S. federal tax code including individual, business, and international tax provisions. The law was enacted rapidly, introduced on November 2, 2017 and becoming public law on December 22, 2017; it applied to the tax year beginning January 1, 2018. Among the key changes to the individual tax code were: reducing the individual income tax brackets (see Table 1 for pre- and post-TCJA tax brackets), increasing the standard deduction for taxpayers, limiting the deductibility of mortgage interest to \$750,000 of mortgage debt from \$1,000,000 of mortgage debt, limiting the deductibility of state and local taxes paid to \$10,000, raising the threshold for the alternative minimum tax for households, raising and expanding the child tax credit, and allowing for the deductibility of qualified business income for pass-through corporations. Many of the TCJA's provisions are set to expire in 2025.

The law was projected to substantially reduce tax revenue from the individual and business tax changes, and raise revenue from the international tax law changes. The Joint Committee on Taxation (JCT) projected that from 2018-2027, the TCJA's individual income tax provisions would reduce revenue by \$1,127 billion, the business income tax provisions would reduce revenue by \$644 billion, and the international tax provisions would raise \$324 billion in revenue (Joint Economic Committee, 2017a). The JCT also projected the distributional effects of tax law. For the individual tax provisions, the bulk of the total reduction in tax revenue was projected in the

\$100,000 to \$200,000 and the \$200,000 to \$500,000 taxpayer income categories: \$51 billion in 2019 (approximately \$1,700 per taxpayer unit) and \$47 billion in 2019 (or \$5,100 per taxpayer unit), respectively. For taxpayers with income less than \$50,000, the TCJA was projected to reduce tax revenue by about \$14 billion in 2019, or about \$150 per taxpayer unit (Joint Economic Committee, 2017b).

III. Data and Empirical Strategy

Consumer Credit Data

To study financial positions of U.S. households, we use information from the Federal Reserve Bank of New York Consumer Credit Panel/Equifax dataset (henceforth, CCP/Equifax).⁴ The CCP/Equifax is an individual-level, panel dataset of consumer credit records, drawn at the end of each quarter from Equifax—one of the three major credit bureaus in the United States. The dataset consists of a five percent random sample of all U.S. individuals with Social Security Numbers and credit records. Each quarter, the panel is updated as new individuals establish credit records. Once an individual establishes a credit history and enters the sample, they remain in the sample continuously, whether or not they have credit activity in a particular quarter, until death. The data include detailed information drawn from credit reports, including loan balances, credit limits, and payment status. Aside from variables on age and geographic location, the dataset is generally limited to information about credit status. CCP/Equifax does not contain information,

⁴ Additional information about the dataset, including sampling and methodology, is available in Lee and van der Klaauw (2010) at https://www.newyorkfed.org/research/staff_reports/sr479.html.

for example, about household income, employment status or demographic characteristics like race and education level.

For the purposes of this study, we use two sets of variables of interest. First, as a measure of credit utilization, we use the number of consumer credit accounts (credit cards, auto loans, mortgages, and total accounts). Second, as measures of credit performance, we use the number of delinquent accounts as well as the probability of delinquency in any of the accounts (credit cards, auto loans, mortgages, and total account). We present summary statistics for the outcome variables in Table 2.

Finally, to draw our data sample of individuals' credit histories, we use a ten percent sample of the overall CCP/Equifax dataset, and limit the time period to 2015 to 2018: three years prior to TCJA enactment to one-year post enactment. We use end-of-year observations to smooth through fluctuations in financial positions over the course of the year.

TCJA Tax Rate Changes by Census Tract

As we do not observe information on individual's incomes or tax filing status in CCP/Equifax, we calculate representative, census-tract-level tax rate changes following TCJA to study how the tax changes affected household finances. We calculate these tax rate changes using data on median household incomes, worker incomes and estimated mortgage payments by census tract for 2017 and the TAXSIM model of individual tax liabilities developed by the National Bureau of Economic Research. Using income and mortgage information from 2017 and applying it to the pre- and post-TCJA income tax provisions gives a measure of local-level tax rate changes that are exogenous with respect to changes in economic conditions due to the TCJA itself. Since

there are substantial interactions between the federal and state tax codes, we calculate the change in the total federal and state effective tax rate to better capture the overall changing tax burden of households. We use the following procedure to calculate these representative tax rate changes:

We first calculate representative tax rate changes for single filers and for joint filers pre- and post-TCJA assuming no mortgage payment. To designate each census tract as a single-filer tract or a joint-filer tract, we use data on filing status of the majority of filers in a zip code from the IRS in 2016 (the latest data available) and match zip codes to census tracts. For zip codes in which the number single filers is more than twice the number of as joint filers (as each joint tax return represents two individuals), we code that zip code as majority single filers. Otherwise, we code the zip code as majority joint filers.

To calculate the single-filer tax rates, we use estimated median worker income by census tract for 2017 from the U.S. Census Bureau. To calculate the joint-filer rates, we use estimated median household income by census tract. We input these income levels and tax status into the TAXSIM model for tax years 2017 (the pre-TCJA tax provisions) and 2018 (the post-TCJA tax provisions). The TAXSIM model calculates individual income tax liability and taxable income for filers with these income levels for each state, allowing us to calculate the change in the average census-tract-level tax rate pre- and post-TCJA by census tract.

We also calculate tax rate changes assuming a representative mortgage interest deduction by census tract for single-filers and joint filers. To calculate the interest deduction, we use data on median home values by census tract from the U.S. Census Bureau in 2013 and calculate the mortgage interest payment assuming the household is in the fifth year of the mortgage (the approximate average U.S. mortgage duration in 2017) with a 30-year fixed rate at 4 percent (the approximate average interest rate in 2013). We input the representative interest deductions together

with household income and filing status into TAXSIM to generate individual income tax rate changes for mortgage-holding individuals pre- and post-TCJA.

Finally, we use mortgage status observed in CCP/Equifax to assign an individual a representative tax rate change calculated assuming a mortgage interest deduction or not, depending on whether the individual holds a mortgage or not. Our primary tax change variable of interest, therefore, takes into account mortgage status, income, and filing status of census tracts. We show robustness to this measures in Section IV.

Of note, this calculation method simplifies the tax changes to provisions that affect income levels and mortgage interest deductions and does not make any assumption about changes in other provisions like property taxes or the child tax credit. We do not include any estimate of local property taxes paid in TAXSIM since we observe mortgage status in CCP/Equifax but not homeownership status. We also do not make any assumption on the number of children, other income potentially received by individuals, or other household behavior that may have affected tax-rate changes.

Our measure of TCJA tax changes shows considerable variation across local geographies. For a sense of geographic dispersion, Figure 1 presents a map of the average, county-level tax cuts for the whole United States. There is further heterogeneity within state, as can be seen in Figure 2, which presents the census-tract-level tax changes for Rhode Island. We also show a histogram of the representative tax changes by individual in the sample in Figure 1 and summary statistics in Table 2. While most individuals live in census tracts that experienced a tax cut, about 0.2 percent of households experienced a tax increase, with the largest number of such individuals being located in California and New York. (These tax increases were primarily due to the TCJA's new limits on the deductibility of mortgage interest and state and local taxes.) The average tax rate change

assuming single-filer status was about -1.1 percentage points across individuals in our sample, while the average tax rate change assuming joint-filer status was about -2.1 percentage points. As the majority of census tracts in the U.S. are joint-filer tracts, the median of our summary measure of the TCJA tax changes is close to the joint-filer change: about 2 percentage points, with a standard deviation of about 0.7 percentage point.

Control variables

We use a number of control variables in the study to account for changing trends in local economic conditions and household wealth. To control for local economic conditions, we use county-level data on the unemployment rate, employment growth, wage growth and the average wage level (in logs) from the Bureau of Labor Statistics. In addition, we include state-level real GDP growth over the previous four quarters from the Bureau of Economic Analysis. To control for differences in wealth levels across geographic regions and wealth accumulation over the period resulting from changes in stock prices or other financial assets, we include variables for the zip-code-level decile of realized capital gains and ordinary dividends received in 2016 (the latest data available) from the Internal Revenue Service. We also include a control for the individual's age range.

Empirical Strategy

To study how personal income tax changes affect household finances, we estimate the following regression specification:

$$\Delta Y_{ict} = \beta_1 TCJATaxCut_{ct} + \gamma_1 X_{int} + \alpha_t + \alpha_n + \epsilon_{ict},$$

where i indicates individuals, c indicates census tract, t indicates year of the observation and n indicates county. In this regression, β_1 is interpreted as effect of a one percentage point tax rate cut on the various household credit outcomes. As we are using the first-difference of the outcome variables, this is equivalent of including a household fixed effect in the regression and controls for time-invariant household characteristics like race or ethnicity.

In order to control for changing trends in local economic conditions, we include the control variables discussed above. We include year fixed effects to control for common time shocks across households and include county fixed effects to control for unobservable, time-invariant local geographic characteristics. Finally, we cluster the standard errors at the county level to allow for arbitrary correlation of errors within a local geography.

IV. Results

First, we analyze the relationship between changes in the personal income tax rate and household credit score—a summary measure of household financial positions. Column (1) of Table 3 reports the effect of the TCJA tax cut on Equifax Risk Score and we find no statistically significant effect. As Equifax Risk Score is a summary measure that incorporates information on credit utilization as well as performance, we study the effects of these other dimensions of consumer credit dynamics in turn.

Next, we study the utilization of credit, measured as changes in the number of loans held by each individual. Columns 2 to 4 of Table 3 report results separately by types of debt, and the final column reports results for all loan types together. As seen in column (1) of Table 2, a one

percentage-point larger tax cut is associated with a 0.006 reduction in the number of credit cards per individual. An average tax cut of about 2.1 percentage points would yield a reduction of about 0.6 percent of the mean dependent variable. Similarly, in column (3), we see that a one pp larger tax cut decreases the number of mortgages by 0.010, or 6 percent at the means.⁵ We find a small and imprecisely measured effects of tax cuts on the number of auto loans (column 2). Taken together, the total number of loans falls by 0.04 loans, a precisely measured but modest 1 percent of the mean.

Next, we proceed with an analysis of the effect of the tax cuts on payment delinquency, reported in Table 4. In Panel A, we display results from analyzing the number of delinquent accounts by type; in Panel B, we analyze the probability of having any delinquent accounts of that type. Both outcomes yield similar results. A one-percentage point larger tax cut is associated with 0.006 fewer delinquent accounts (Panel A column 4; 2.3 percent of the mean), and a 0.1 percentage point decrease in the probability of any delinquent accounts (panel B column 4; 1 percent of the mean); recall that the average tax cut was about 2 percentage points. These patterns are driven primarily by reductions in auto loan delinquency (column 2), as estimated effects for credit card and mortgage delinquency, though negative as expected, are very small and imprecisely measured. Note that the regressions by loan type (columns 1 through 3) include all consumers, not just those with outstanding loans of a particular type, so the sample are unaffected by any changes in the composition of borrowers before and after the tax cut.

Finally in table 5, we report results of a number of robustness checks. First, given that our primary independent variable, a census-tract level measure of tax cuts, required a number of strong

⁵ This analysis is not conditional on homeownership. Our tax cut computations incorporates mortgage interest deductions for individuals with a mortgage; see section III for more details.

assumptions to compute, we re-estimate our models using tax cut measures generated using alternative assumptions. The first column re-displays the results for the baseline specification from Table 3 for comparison. In column 2, we alternatively re-calculate the census-tract-level representative tax cut assuming all households in the census tract are single filers, and in column 3, we assume households are all married, filing jointly, with zero children. The results are qualitatively similar to our baseline regressions, though the magnitude of results are slightly larger in magnitude for the assumption of all joint filers with zero children.

Finally, in column 4, we present estimates of our baseline model omitting control variables. We had included the control variables to account for the fact that state-level taxes (that are included in our independent variable) might be correlated with other state macroeconomic conditions that could also influence the financial behavior of households. The fact that the estimated coefficients here in column 4 are somewhat larger in magnitude than the baseline suggests that our results are not driven primarily by spatial heterogeneity in economic conditions during this time period. All in all, our results are broadly insensitive to these alternative assumptions and specifications.

V. Discussion

We study the effect of individual income tax cuts from the TCJA on household financial behavior, in particular utilization of credit and loan performance. We find that the tax cuts are associated with modest reductions in the number of loans held by individuals. The small magnitude of these results may reflect a general pattern of small behavioral response, particularly if individuals did not perceive an increase in disposable income.

Our results might also be consistent with substantial underlying heterogeneity in responses, as one might expect that some families might respond to tax cuts by reducing their debt, while other families might borrow more. Another possibility, given the heterogeneity in the changes in tax burdens generated by the TCJA, is that families with highly elastic financial behavior may not necessarily have received sizable tax cuts. Further distributional analysis would shed some light on these underlying explanations.

We also find reductions in payment delinquency and thereby improved loan performance, particularly for auto loans. The magnitude of these effects is small, consistent with the gradual accrual of the increased disposable income due to the changes to income tax withholding tables that occurred to implement the TCJA.

One caveat is that our analysis does not include the filing/refund season for 2018 individual tax returns. Any tax filers receiving smaller-than-expected refunds respond as if they faced a reduction in (expected) disposable income. Further research could shed light on whether the patterns we find in the data persist or change over time.

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Figures and Tables

Figure 1: TCJA Tax Changes by Census Tract

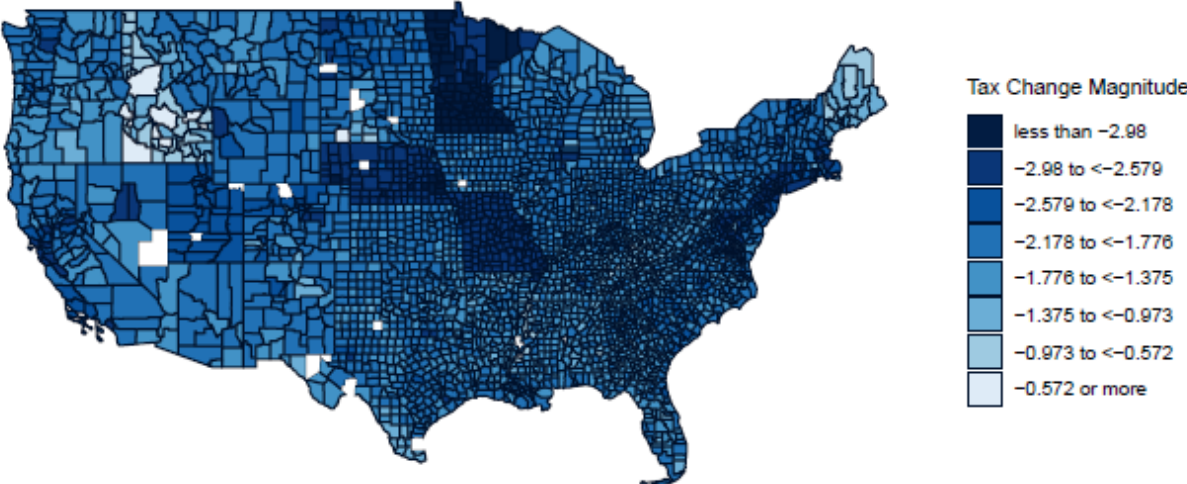
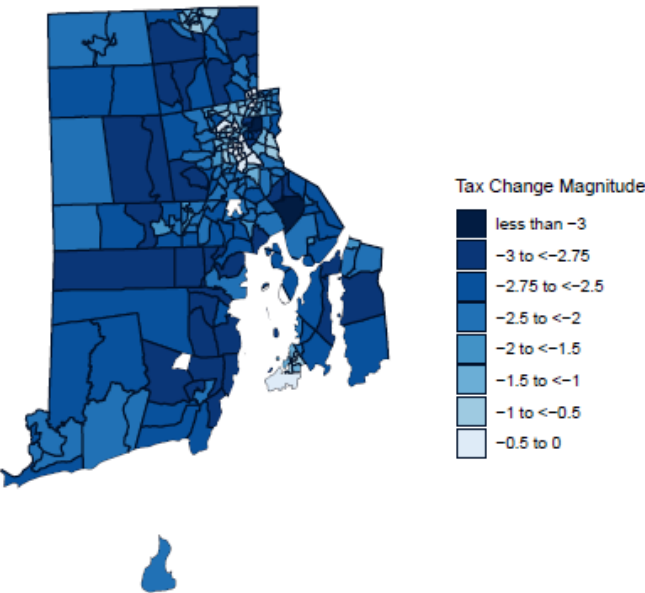
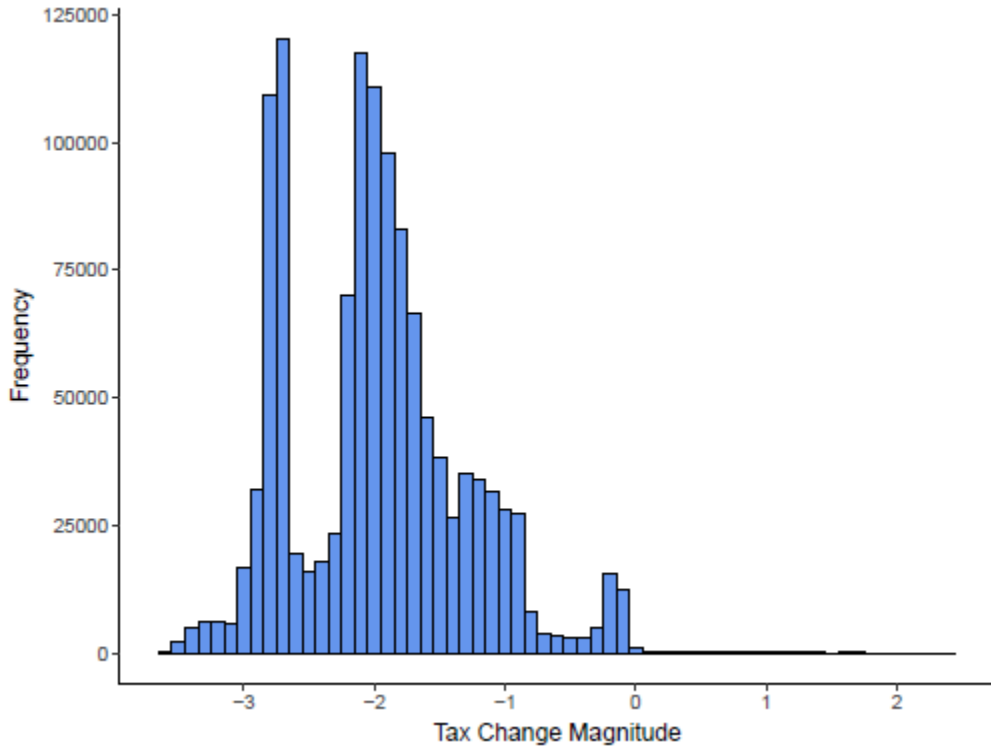


Figure 2: TCJA Tax Changes by Census Tract: Rhode Island



Source: Authors' calculations based on data from the U.S. Census Bureau and the NBER TAXSIM model.

Figure 3. Distribution of TJCA Tax Rate Changes by U.S. Census Tract, Analysis Sample



Note: This figure presents a histogram of the post-TCJA, representative income tax rate changes for the sample of individual observations in our study, as described in Section III. The source is authors' calculations based on data from the U.S. Census Bureau and the NBER TAXSIM model.

Table 1: Individual Income Tax Brackets Pre- and Post-TCJA

Pre-TCJA			Post-TCJA		
Rate	Single filers	Married, filing jointly	Rate	Single filers	Married, filing jointly
10%	\$0	\$0	10%	\$0	
15%	\$9,325	\$18,650	12%	\$9,525	\$19,050
25%	\$37,950	\$75,900	22%	\$38,700	\$77,400
28%	\$91,900	\$153,100	24%	\$82,500	\$165,000
33%	\$191,650	\$233,350	32%	\$157,000	\$315,000
35%	\$416,700	\$416,700	35%	\$200,000	\$400,000
39.6%	\$418,400	\$470,700	37%	\$500,000	\$600,000

Note: This table shows individual income tax brackets for single filers and joint filers prior to enactment of the TCJA and post enactment. The rate shown is applied to taxable income above the amounts given in the following column through the income level for the next highest tax bracket.

Source: Internal Revenue Service

Table 2: Summary Statistics

	No. Observations	Mean	St. Dev
Equifax Risk Score (divided by 10)	3,264,112	70.5	10.6
<u>Number of Accounts</u>			
Credit Cards	3,742,132	1.788	2.188
Auto Loans	3,742,132	0.420	0.672
Mortgage Loans	3,742,132	0.286	0.544
Total Accounts	3,742,132	4.347	4.491
<u>Any Delinquency</u>			
Credit Cards	3,742,132	0.054	0.227
Auto Loans	3,742,132	0.027	0.161
Mortgage Loans	3,742,132	0.005	0.068
Total Accounts	3,742,132	0.119	0.324
<u>Number of Delinquent Accounts</u>			
Credit Cards	3,742,132	0.084	0.437
Auto Loans	3,742,132	0.030	0.187
Mortgage Loans	3,742,132	0.005	0.071
Total Accounts	3,742,132	0.265	1.050
<u>Tax Changes Post-TCJA</u>			
Single filers	1,251,000	-1.122	0.531
Joint filers	1,246,684	-2.117	0.548
Matched by majority filing status	1,250,168	-1.979	0.671

The table reports summary statistics for outcome variables used in the analysis of the effect of the 2017 personal income tax cut on household finances. Source is CCP/Equifax.

Table 3: Income Tax Cuts, Credit Scores, and Number of Credit Accounts

	Equifax Risk Score	Number of Accounts			
		Credit Cards	Auto Loans	Mortgages	Total
		(1)	(2)	(3)	(4)
TCJATaxCut	0.000454 [0.0108]	-0.00577*** [0.00164]	-0.000888 [0.000573]	-0.00950*** [0.00112]	-0.0395*** [0.00370]
Controls	+	+	+	+	+
Year Fixed Effects	+	+	+	+	+
County Fixed Effects	+	+	+	+	+
Observations	3,225,399	3,741,413	3,737,999	3,741,413	3,741,413
R-squared	0.003	0.012	0.018	0.005	0.018

This table presents estimate of the TCJA individual income tax cut on the number of credit accounts outstanding, estimated in specification (1). The coefficients are interpreted as the change in the number of accounts outstanding resulting from a 1 percentage point cut in the personal income tax rate. Columns (1) to (4) show results for credit cards, auto loans, mortgages and total credit accounts, respectively. Controls include the county-level unemployment rate, employment growth, log average wage, and total wage growth; the state-level real GDP growth; the individual age-group; and the census-tract realized capital-gains decile and census-tract ordinary dividends received decile. Standard errors are clustered at the county level and are reported in brackets. ***, ** and * indicate levels of 1 percent, 5 percent, and 10 percent significance, respectively.

Table 4: Income Tax Cuts and Credit Performance by Type**Panel A: Number of Delinquent Accounts**

	Credit Cards	Auto Loans	Mortgages	Total
	(1)	(2)	(3)	(4)
TCJATaxCut	-0.000292 [0.000679]	-0.000935*** [0.000246]	-0.0000847 [0.000101]	-0.00597*** [0.00192]
Controls	+	+	+	+
Year Fixed Effects	+	+	+	+
County Fixed Effects	+	+	+	+
Observations	3,741,413	3,741,413	3,741,413	3,741,413
R-squared	0.001	0.001	0.001	0.001

Panel B: Probability of Delinquent Account

	Credit Cards	Auto Loans	Mortgages	Total
TCJATaxCut	-0.000328 [0.000439]	-0.000831*** [0.000259]	-0.0000962 [0.000106]	-0.00114** [0.000577]
Controls	+	+	+	+
Year Fixed Effects	+	+	+	+
County Fixed Effects	+	+	+	+
Observations	3,741,413	3,741,413	3,741,413	3,741,413
R-squared	0.001	0.001	0.001	0.002

This table presents estimate of the TCJA individual income tax cut on the number of credit accounts outstanding, estimated in specification (1). The coefficients are interpreted as the change in the number of accounts outstanding resulting from a 1 percentage point cut in the personal income tax rate. Columns (1) to (4) show results for credit cards, auto loans, mortgages and total credit accounts, respectively. Controls include the county-level unemployment rate, employment growth, log average wage, and total wage growth; the state-level real GDP growth; the individual age-group; and the census-tract realized capital-gains decile and census-tract ordinary dividends received decile. Standard errors are clustered at the county level and are reported in brackets. ***, ** and * indicate levels of 1 percent, 5 percent, and 10 percent significance, respectively.

Table 5: Robustness of Effect of Individual Tax Cuts on Number of Credit Accounts

	Baseline	Assumed All Single-Fileers	Assumed All Married Filers, Zero Children	No Economic Controls
	(1)	(2)	(3)	(4)
<u>Number of Accounts:</u>				
Credit Cards	-0.00577*** [0.00164]	-0.00174 [0.00197]	-0.00595*** [0.00182]	-0.0104*** [0.00144]
Auto Loans	-0.000888 [0.000573]	-0.00160** [0.000707]	-0.00165** [0.000750]	-0.00233*** [0.000552]
Mortgage Loans	-0.00950*** [0.00112]	-0.0105*** [0.00159]	-0.0151*** [0.00165]	-0.00950*** [0.00112]
Total Accounts	-0.0395*** [0.00370]	-0.0383*** [0.00389]	-0.0605*** [0.00368]	-0.0464*** [0.00336]
Controls	+	+	+	-
Year Fixed Effects	+	+	+	+
County Fixed Effects	+	+	+	+

This table presents results of robustness tests of the effect of the TCJA individual income tax cuts on the number of credit accounts outstanding, estimating specification (1). The coefficients are interpreted as the effect of a 1 percentage point tax rate cut on the number of credit accounts outstanding. Column (1) shows results for the baseline specification in Table 2 for comparison. Column (2) shows results for calculating the census-tract-level representative tax cut assuming all households in a census tract are single filers. Column (3) shows results for calculating the census-tract-level representative tax cut assuming all households in the census tract are married, filing jointly, with zero children. Column (4) shows results for a specification that excludes control variables from the regression. Controls are included for specifications in columns (1) to (3) and include the end-of-year county-level unemployment rate, employment growth, log average wage, and total wage growth; state-level real GDP growth; the individual age-group; and the census-tract-level realized capital-gains decile and ordinary dividends received decile in 2016. Standard errors are clustered at the county level and are reported in brackets. ***, ** and * indicate levels of 1 percent, 5 percent, and 10 percent significance, respectively.