

A Online Appendix

A.1 Implementing TAXSIM

The NBER’s TAXSIM module calculates federal and state income tax liabilities at the *tax unit* level. A major task in preparing the CPS data for processing by TAXSIM is to combine the individual-level CPS data into tax units. In particular, we define individuals over the age of 18 as their own tax unit even if they are living in the same household as their parents and/or other relatives. Children over the age of 15 who are members of a household in the CPS, but who have positive wages and/or other earnings, are also classified as their own tax unit. In addition, we identify tax units as “joint” filers if the primary tax payer (household head) is married, “single” if the primary tax payer is unmarried, and “head of household” if he/she is unmarried but has dependents. When available, a spouse’s income data are combined with the primary taxpayer’s income data for all relevant income categories.

The other major task with implementing TAXSIM is to match the CPS earnings data categories with the appropriate income categories utilized by TAXSIM as inputs for calculating taxpayers tax liabilities. Total earnings are defined as the sum of business, farm, and wage income, and there is a fairly direct match between the remaining data needed to run TAXSIM and the data available in the CPS, with a few exceptions. In particular, dividend income data are only available as a separate category in the CPS from 1988 onward (TAXSIM #9). Prior to 1988 these data were included in capital income, which falls under the “other income” category in (TAXSIM #10). As a result, the stand-alone dividend income category is set to zero prior to 1988. In addition, the CPS does not have data on a tax unit’s rent paid, child care expenditures, or unemployment compensation.²⁰ (TAXSIM #s 14, 17, 18). These fields are also set to zero. We impute capital gains based on tax return data collected by the Statistics of Income (SOI) section of the IRS. This imputation procedure is based on a tax unit’s inflation-adjusted wages and marital status. Finally, we use the same procedure with SOI data to impute whether or not a tax unit itemizes its deductions and the dollar amount of its itemized deductions (if applicable).²¹

After executing TAXSIM, we aggregate tax unit income tax liability data up to the household level (our unit of analysis for the CPS). These liabilities are then added to a household’s estimated sales tax and gas tax burdens to get a measure of its total tax burden.

A.2 Using CEX Data to Calculate Sales and Gas Tax Burdens in the CPS

The CEX is a nationally representative survey, but it contains a smaller sample than the CPS and the state identifiers for households living in a number of the less populated states in the U.S. are suppressed for confidentiality reasons. As a result, we calculate consumers’ average expenditures on food, clothing, and other taxable goods by age and income groups for the U.S. as a whole.^{22,23} Consumers are divided into 10-year age groups, and average expenditures are

²⁰ Unemployment compensation is only unavailable prior to 1988. Before this year it was combined with workers compensation and veterans payments. We include unemployment compensation in the “other income” category (TAXSIM #10) in all years.

²¹ For the itemization imputation, each tax unit’s taxes are calculated twice by TAXSIM—once assuming the unit itemizes and once assuming it does not. The final personal income tax burden for the tax unit is the weighted average of these two calculations with the weight equal to the tax unit’s implied probability of itemization.

²² Other taxable items include tobacco, alcohol, personal care items (including grooming services), toys, flowers, paper goods, home furnishings, home appliances, vehicles, vehicle parts, medical supplies, books, recreation (including

calculated within these age groups by income decile. Our selection criteria for the CEX sample are discussed below. The CEX expenditure data are then translated into the CPS based on the equivalent age and income groupings. The sales tax burden for each CPS household is then obtained by applying the sales tax rate in the tax unit's state of residence to the relevant expenditure data. Our sales tax liability estimates take into account whether food and/or clothing are exempt from sales taxes in a household's given state of residence.^{24,25}

Our approach to calculate a household's gas tax burden is slightly different. We estimate a reduced-form demand equation for gallons of gasoline consumed in the CEX, making use of our data on the total (tax inclusive) price of gasoline to capture the price elasticity of demand. In particular, we estimate

$$g_{it} = \beta_1 p_t^s + \beta_2 Y_{it} * A_{it} + \beta_3 D_t + \epsilon_{it}, \quad (\text{A.1})$$

where g_{it} is gallons of gas consumed by household i in year t , p_t^s is the state-specific price of gas, $Y_t * A_t$ are a set of income (Y) and age group (A) interaction terms (to capture life-cycle influences on gas consumption), and D_t are year and census region dummy variables to capture region and time-specific trends in gasoline consumption.²⁶ The β parameters from equation (A.1) are used to impute each household's gallons of gasoline consumed in the CPS. The household's gas tax burden is then calculated based on state-specific fuel taxes and the household's imputed gasoline consumption.²⁷

A.3 CEX Sample Selection

There are two distinct surveys that constitute the CEX: a "Diary" component that surveys consumers' daily spending habits over the course of two weeks, and an "Interview" survey that asks respondents to report their spending habits for the past three months. In the interview survey, consumer units (households) are followed for up to four consecutive quarters.²⁸ Since the interview survey collects spending data for a longer horizon than the diary survey, the interview part of CEX is used in this paper.

The sample selection for the CEX data follows the standard approach in the literature. The primary criteria are that consumer units must be in the sample for all four interviews, and

equipment), and jewelry.

²³ A few states have sales tax bases which are broader than the food, clothing and other taxable items categories. Due to the difficulty in quantifying state-by-state differences in sales tax bases over nearly 30 years, our analysis is unable to account for these differences. However, the states that have the broadest bases currently—HI, NM, SD, and WY—are all quite small, and adjusting their bases would have little effect on the results for the U.S. as a whole.

²⁴ Data on state sales tax rates and sales tax exemptions were collected from the yearly State Tax Handbook, published by Commerce Clearing House, Inc. and the yearly Guide to Sales and Use Taxes, published by the Research Institute of America.

²⁵ The CEX expenditure data include sales taxes. As a result, the state sales tax rates are applied to the average expenditure data to back out before-tax expenditures. The sales tax burden is the difference between total expenditures and before-tax expenditures.

²⁶ Consumers in the CEX are divided into five 10-year age groups (A) and 10 income groups (Y). Regional effects are included because consumers in Wyoming may have different driving needs than those in Rhode Island or Massachusetts.

²⁷ Erich Muehlegger kindly provided yearly data on federal and state gas tax rates per gallon as well as state-level data on before-tax fuel costs (per gallon).

²⁸ Data collection starts in the 2nd interview and runs through the 5th interview. The 1st interview is used only to gather background information on the consumer unit.

they must have complete income responses.²⁹ It is necessary for households to be in the survey for all four quarters in order to get an accurate picture of their annual expenditures. The income data are necessary in order to match the CEX expenditures with the CPS data. The CEX tracks the income of husbands and wives separately. These data are combined, where applicable, to get a measure of total income for each household. The earnings categories are chosen to most closely match the earnings data available in the CPS.

In addition, households may begin their quarterly interviews at any month during the year, so it is important to take this timing into account when calculating annual expenditures. If a consumer unit is interviewed for at least two quarters in a given year t , then the reference year for their consumption is t , otherwise the reference year for their spending is $t - 1$. This timing convention is consistent with the existing literature.

A.4 Changes in Tax Compression Explained

Recall that $comp_{90/10}$ is solely a function of the average tax rates at the different points in the before-tax income distribution

$$comp_{90/10} = \log\left(\frac{1 - t_{10}}{1 - t_{90}}\right)$$

Changes in tax compression occur in two ways. First, holding the before-tax distribution of income fixed, legislated tax changes that alter average tax rates may change tax compression (for example, $\frac{\partial comp_{90/10}}{\partial t_{90}} > 0$). Second, holding the legislated parameters of the tax system fixed, changes in the distribution of before-tax income may cause a change in compression if the tax system is progressive or regressive, but not if the system is proportional. For instance, under a progressive personal income tax an increase in income for the 90th percentile taxpayer will either bump him to a higher marginal tax bracket or will lead him to pay his existing marginal tax rate on a larger fraction of his income: $\frac{\partial t_{90}}{\partial Y_{90}} > 0$. Thus, an increase in 90th percentile income will increase compression:

$$\frac{\partial comp_{90/10}}{\partial Y_{90}} = \frac{\partial comp_{90/10}}{\partial t_{90}} * \frac{\partial t_{90}}{\partial Y_{90}} > 0$$

Incomes will often change simultaneously at different points in the before-tax income distribution. Under a progressive tax structure, as long as the dollar increase at the 90th percentile is equal to or larger than the dollar increase at the 10th percentile, compression will increase. In particular, assume that the tax system is “equally” progressive at both the 90th and 10th percentile of before-tax income such that

$$\frac{\partial t_{90}}{\partial Y_{90}} = \frac{\partial t_{10}}{\partial Y_{10}} = \alpha$$

The change in compression with an increase in 90th percentile income is:

²⁹ Income data are collected only in the 2nd and 5th interviews.

$$\frac{\partial comp_{90/10}}{\partial Y_{90}} = \frac{\partial comp_{90/10}}{\partial t_{90}} * \frac{\partial t_{90}}{\partial Y_{90}} = \frac{1}{1 - t_{90}} * \alpha$$

The corresponding compression change at the 10th percentile is:

$$\frac{\partial comp_{90/10}}{\partial Y_{10}} = \frac{\partial comp_{90/10}}{\partial t_{10}} * \frac{\partial t_{10}}{\partial Y_{10}} = \frac{-1}{1 - t_{10}} * \alpha$$

Increasing average tax rates, $t_{90} > t_{10}$, imply that

$$\frac{\partial comp_{90/10}}{\partial Y_{90}} > \left| \frac{\partial comp_{90/10}}{\partial Y_{10}} \right|$$

Under the same progressivity assumption, equal *percentage* increases in income at the 90th and 10th percentiles—which would hold the before-tax 90/10 income differential constant—result in an increase in compression, as such a change implies a larger dollar increase in Y_{90} than in Y_{10} . Similarly, an increase in incomes that widens the before-tax 90/10 differential will yield an increase in compression under a progressive tax system.

A.5 Evolution of Income Percentiles

Figure A.1 displays the evolution of the 90th, 50th and 10th percentiles (Panels A, B, and C, respectively) of gross income (green line with solid circles), income net of federal taxes (blue line with solid diamonds), income net of state taxes (red line with hollow squares) and income net of both state and local taxes (orange line with solid squares).³⁰ The wedge between gross and net income shrinks somewhat over time at both the upper and middle portions of the income distribution, indicating that tax burdens as a share of income were declining. The decline, though, is greater at the 50th percentile than at the 90th percentile, consistent with an increase in tax compression of upper tail income inequality.

Panel C displays a significant narrowing of the difference between gross and net income at the 10th percentile. The narrowing is due to both the federal and state tax codes: the difference between gross income and income net of federal taxes (blue line with solid diamonds) and the difference between gross income and income net of state taxes (red line with hollow squares) both shrink between the mid-1980s and 2007. Significantly, by 2006 there is little difference between gross income and income net of federal taxes.

During and following the Great Recession, gross income at the 10th percentile fell dramatically, but income net of Federal taxes fell by much less. Notably, income net of federal taxes actually stands well *above* gross income over this period. Panel D reveals that this inversion of gross and net incomes is due to the Federal EITC as income net of all Federal taxes but the EITC (the grey line with hollow diamonds) remains below gross income. It appears that the Federal EITC meaningfully reduced the effect of the Great Recession on lower tail incomes (but by no means eliminated the effect). More broadly, Panel D illustrates the growing importance of the Federal EITC for low-income earners: In 1984 the credit had little influence on lower tail

³⁰ The data shown in Figure A.1 are in logs. As a result, adding the amount of federal compression and the amount of state compression will not equal total (net) compression (that is, $\log(A - B) \neq \log(A) - \log(B)$).

incomes, but by 2011 it substantially boosted these incomes.

A.6 Evolution of Tax Compression over Time

Figure A.2 explores the evolution over time of tax compression on a state-by-state basis. In the top panel, the horizontal axis displays the 20-year change in the *gross* 90/10 log income differential, and the vertical axis displays the corresponding 20-year change in the *net* 90/10 split. Small cell sizes for some states cause the 90/10 splits to vary considerably from year to year. We use 3-year windows of 1984–1986 and 2004–2006 to calculate the 20-year changes in order to smooth through this variability.³¹

States on the 45-degree line passed the change in before-tax income inequality one-for-one into after-tax inequality. States below the line mitigated the rise in inequality by passing through less than 100 percent of the before-tax rise in income inequality to after-tax inequality. Finally, states above the line intensified the increase in inequality by passing through more than 100 percent of the before-tax rise in inequality to after-tax inequality. On average, the states are roughly clustered around a small, almost parallel, downward shift in the 45-degree line. These results therefore again indicate an increase in tax compression over the period of study. Both the state and federal codes play a role in the less-than-full pass-through of the rise in pre-tax inequality (Panels B and C).

A.7 Approach for Evaluating Labor Supply Response to EITC

In the paper we run a counter-factual that allows for a labor supply response to the EITC. We focus our attention on single women with children as this group accounts for most EITC expenditures.³² The large literature on effect of the EITC on the labor supply of this group comes to remarkably consistent conclusions. First, it finds that there is a strong positive relationship between the EITC and employment rates. The range of estimated elasticities of labor force participation with respect to net income across the studies is narrow: 0.69 to 1.16. Second, there is little evidence of a labor supply response on the intensive margin (i.e. on hours worked conditional on being employed). See Eissa and Hoynes (2006) and Hotz and Scholz (2003) for reviews of this literature and discussion of the labor force participation elasticities.

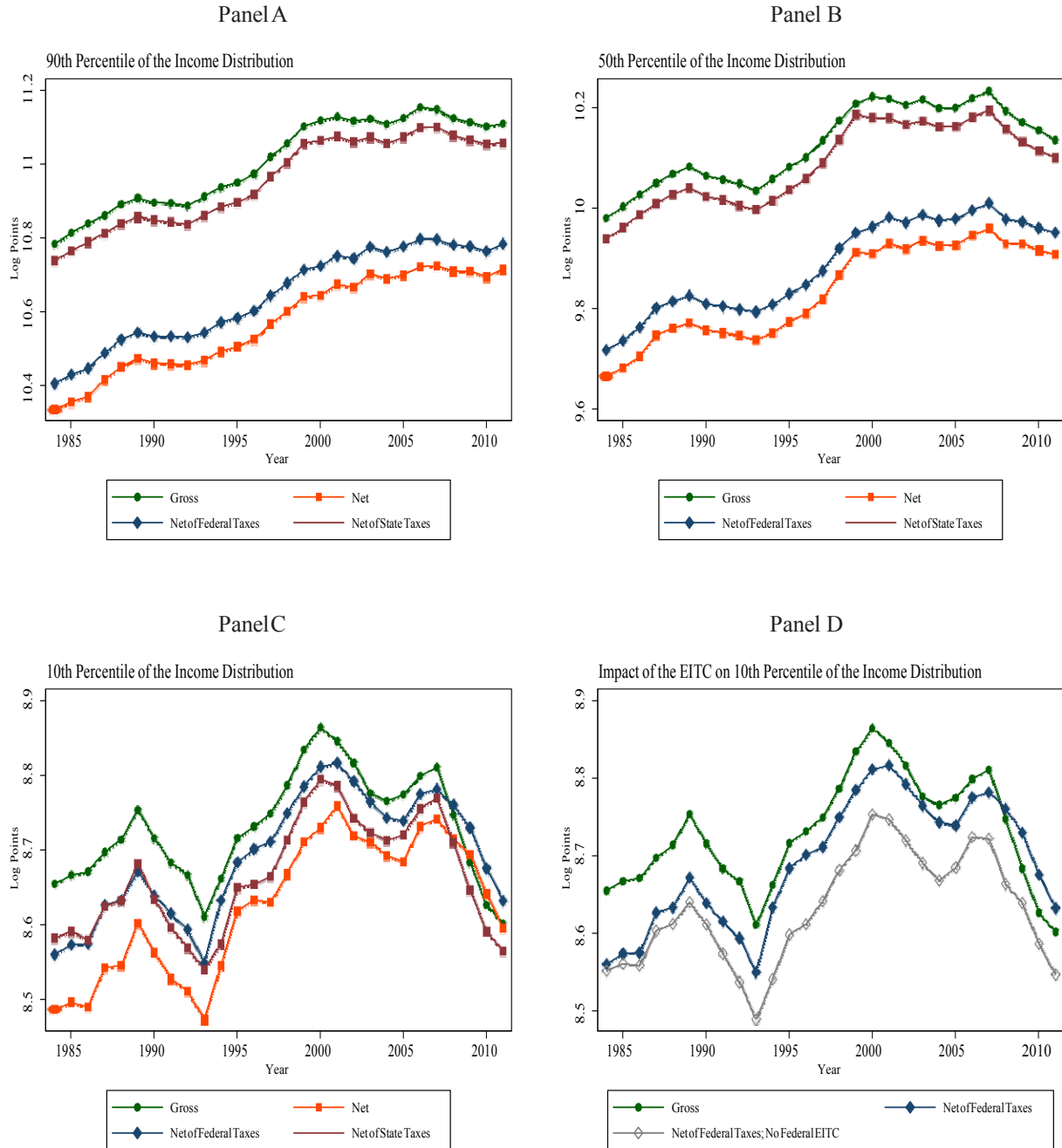
Consistent with the above findings, we assume that the only labor supply response to the EITC occurs on the labor force participation margin for single women with children. We take the high end of the elasticity range identified in the literature, 1.16, and calculate the implied number of single women with children in our sample who are employed as a result of the EITC (assuming those with the highest EITC receipt are the ones induced to enter the labor force). We then assume that all the labor income of these women is due to the EITC, and thus set their pre-tax labor earnings to zero, but retain their positive labor earnings in the after-tax measure of income. Finally, we recalculate our compression measure.³³

³¹ We avoid using the final years of the sample so we can compare two periods of economic expansion. This also prevents the comparison from reflecting the temporary tax measures enacted in response to the Great Recession.

³² Seventy-five percent of EITC expenditures go to single individuals with children. The disproportionate share of expenditures going to this group reflects the high eligibility rates of single women with children.

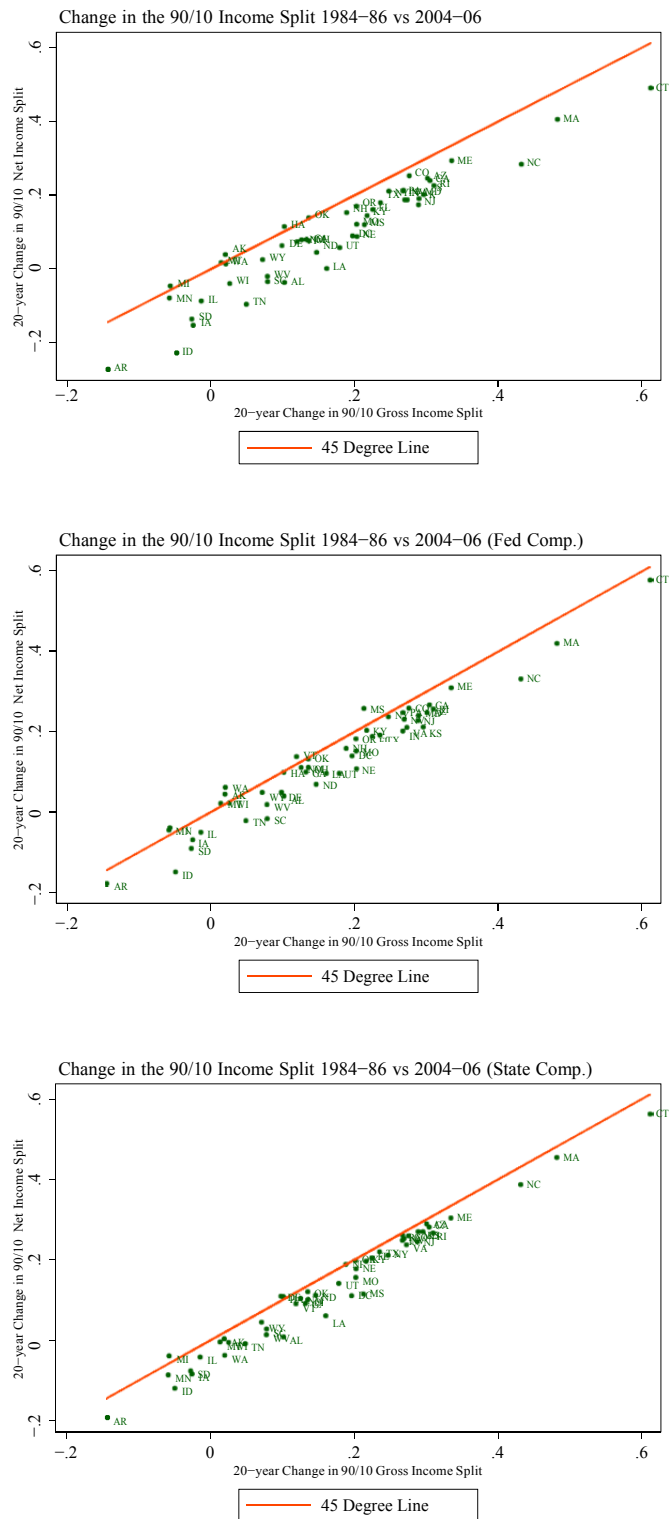
³³ In most states, over most of our sample period, the size of the federal EITC is substantially greater than the state EITC. We therefore only consider the federal EITC in this sensitivity analysis.

Figure A.1: Pre-Tax and Post-Tax Income over Time



Source: Authors' calculations using CPS data.

Figure A.2: Changes in Income Inequality 1980s to 2000s



Source: Authors' calculations using CPS data.

Table A.1: Total Compression

	90th Percentile		10th Percentile		Gross 90/10 -Net 90/10 ¹
	Gross Inc.	Net Inc.	Gross Inc.	Net Inc.	
AK	68.2	46.6	8.2	7.7	31.5
AL	50.8	33.9	4.8	4.3	28.5
AR	46.1	30.7	4.9	4.3	27.0
AZ	59.5	39.1	5.7	5.1	31.7
CA	70.3	43.0	6.2	5.7	39.9
CO	65.6	42.0	7.7	6.9	34.2
CT	73.5	46.3	8.9	7.9	34.3
DC	86.7	50.7	4.9	4.4	42.4
DE	60.4	39.0	8.2	7.6	36.2
FL	57.8	39.9	6.0	5.3	25.1
GA	57.5	36.9	5.9	5.5	36.0
HA	65.1	40.8	7.4	6.6	35.5
IA	51.0	33.3	7.3	6.5	30.4
ID	49.9	32.1	6.5	5.8	32.5
IL	62.5	40.4	6.5	5.6	28.7
IN	52.9	35.0	6.7	5.8	27.8
KS	55.0	35.4	6.9	6.2	33.7
KY	50.8	33.1	4.8	4.3	31.4
LA	52.0	34.7	4.1	3.5	26.3
MA	71.5	44.3	7.4	6.7	37.7
MD	71.8	44.9	9.0	7.9	34.0
ME	51.3	33.2	6.5	5.9	33.1
MI	59.7	38.4	6.0	5.6	35.8
MN	61.7	38.4	8.2	7.4	37.3
MO	55.2	35.9	6.4	5.7	31.4
MS	45.9	30.9	4.2	3.5	21.6
MT	46.9	31.7	5.6	5.2	31.3
NC	53.9	34.3	6.1	5.4	33.6
ND	48.1	32.9	6.6	5.9	26.5
NE	52.2	34.2	7.5	6.7	30.9
NH	63.3	43.6	10.0	9.1	27.8
NJ	75.1	47.3	8.4	7.5	34.8
NM	53.6	35.2	4.6	4.1	31.8
NV	58.5	40.0	7.6	6.7	25.5
NY	66.6	41.6	5.3	4.9	39.6
OH	55.7	36.4	6.2	5.6	32.4
OK	52.3	33.9	5.6	5.0	31.7
OR	57.2	36.4	6.5	6.1	38.4
PA	58.9	38.7	6.6	5.9	31.1
RI	61.5	39.4	7.1	6.4	33.9
SC	51.1	33.2	5.8	5.0	28.7
SD	48.1	34.0	6.3	5.5	21.5
TN	50.3	34.8	5.2	4.4	21.1
TX	58.8	40.0	5.7	5.2	28.9
UT	53.0	34.2	8.0	7.0	31.4
VA	69.8	43.4	7.9	7.0	35.0
VT	54.8	35.7	7.7	7.1	34.4
WA	62.7	42.6	7.4	6.6	26.8
WI	54.8	35.0	7.8	7.1	35.1
WV	46.2	30.4	4.2	3.4	22.4
WY	51.7	36.2	7.1	6.5	25.8
Total	58.0	37.7	6.6	5.9	31.5

Source: Authors' calculations using CPS data. Notes: ¹ Percentage points.

Table A.2: Federal Compression

	90th Percentile		10th Percentile		Gross 90/10 -Net 90/10 ¹
	Gross Inc.	Net Inc.	Gross Inc.	Net Inc.	
AK	68.2	46.6	8.2	7.7	31.8
AL	50.8	36.3	4.8	4.7	31.7
AR	46.1	33.3	4.9	4.8	29.6
AZ	59.5	41.7	5.7	5.4	30.6
CA	70.3	48.0	6.2	6.0	34.4
CO	65.6	45.3	7.7	7.2	30.0
CT	73.5	49.8	8.9	8.3	31.4
DC	86.7	58.8	4.9	4.8	35.8
DE	60.4	42.1	8.2	7.7	30.3
FL	57.8	40.6	6.0	5.7	30.3
GA	57.5	40.1	5.9	5.7	32.4
HA	65.1	45.8	7.4	6.9	28.8
IA	51.0	36.2	7.3	6.8	26.9
ID	49.9	35.8	6.5	6.2	28.6
IL	62.5	43.2	6.5	6.2	33.0
IN	52.9	37.4	6.7	6.3	29.1
KS	55.0	38.7	6.9	6.5	30.4
KY	50.8	36.2	4.8	4.6	30.5
LA	52.0	36.8	4.1	3.9	31.6
MA	71.5	48.7	7.4	7.1	33.6
MD	71.8	48.9	9.0	8.3	30.0
ME	51.3	36.7	6.5	6.3	29.2
MI	59.7	41.6	6.0	5.9	33.0
MN	61.7	42.7	8.2	7.6	29.0
MO	55.2	38.8	6.4	6.1	30.1
MS	45.9	33.3	4.2	4.1	29.5
MT	46.9	34.0	5.6	5.4	27.6
NC	53.9	38.0	6.1	5.8	31.0
ND	48.1	34.5	6.6	6.2	27.6
NE	52.2	37.2	7.5	7.1	27.5
NH	63.3	43.7	10.0	9.2	28.1
NJ	75.1	50.7	8.4	7.8	32.0
NM	53.6	38.1	4.6	4.4	32.0
NV	58.5	40.8	7.6	7.1	29.0
NY	66.6	46.2	5.3	5.1	33.8
OH	55.7	39.3	6.2	6.0	31.9
OK	52.3	37.0	5.6	5.4	29.9
OR	57.2	40.7	6.5	6.2	29.7
PA	58.9	41.1	6.6	6.4	32.7
RI	61.5	43.0	7.1	6.8	31.6
SC	51.1	36.4	5.8	5.5	29.5
SD	48.1	34.6	6.3	5.9	27.1
TN	50.3	35.8	5.2	5.0	30.5
TX	58.8	40.7	5.7	5.5	33.1
UT	53.0	37.5	8.0	7.4	27.1
VA	69.8	47.7	7.9	7.4	31.4
VT	54.8	38.7	7.7	7.3	28.9
WA	62.7	43.5	7.4	7.0	30.6
WI	54.8	38.9	7.8	7.3	28.0
WV	46.2	33.4	4.2	4.0	28.7
WY	51.7	36.7	7.1	6.8	28.6
Total	58.0	40.6	6.6	6.3	30.4

Source: Authors' calculations using CPS data. Notes: ¹ Percentage points.

Table A.3: State Compression

	90th Percentile		10th Percentile		Gross 90/10 -Net 90/10 ¹
	Gross Inc.	Net Inc.	Gross Inc.	Net Inc.	
AK	68.2	68.2	8.2	8.1	-0.3
AL	50.8	48.5	4.8	4.4	-5.1
AR	46.1	43.4	4.9	4.5	-3.5
AZ	59.5	56.7	5.7	5.3	-1.5
CA	70.3	65.4	6.2	5.9	1.6
CO	65.6	62.3	7.7	7.5	2.2
CT	73.5	70.0	8.9	8.5	0.6
DC	86.7	78.8	4.9	4.6	1.5
DE	60.4	57.2	8.2	8.0	3.5
FL	57.8	57.2	6.0	5.6	-5.5
GA	57.5	54.1	5.9	5.7	1.2
HA	65.1	60.0	7.4	7.0	3.5
IA	51.0	48.0	7.3	7.0	2.0
ID	49.9	46.2	6.5	6.1	0.9
IL	62.5	59.6	6.5	5.8	-5.5
IN	52.9	50.5	6.7	6.2	-2.9
KS	55.0	51.8	6.9	6.5	1.2
KY	50.8	47.8	4.8	4.4	-1.9
LA	52.0	49.9	4.1	3.6	-7.1
MA	71.5	67.1	7.4	7.0	1.4
MD	71.8	67.9	9.0	8.7	2.3
ME	51.3	47.9	6.5	6.2	1.0
MI	59.7	56.6	6.0	5.7	0.1
MN	61.7	57.2	8.2	8.0	5.2
MO	55.2	52.4	6.4	6.0	-1.5
MS	45.9	43.5	4.2	3.6	-9.5
MT	46.9	44.5	5.6	5.5	2.4
NC	53.9	50.1	6.1	5.7	0.0
ND	48.1	46.5	6.6	6.2	-2.8
NE	52.2	49.3	7.5	7.2	1.5
NH	63.3	63.1	10.0	10.0	-0.2
NJ	75.1	71.7	8.4	8.1	0.9
NM	53.6	50.8	4.6	4.2	-1.4
NV	58.5	57.6	7.6	7.3	-3.5
NY	66.6	62.2	5.3	5.1	3.2
OH	55.7	52.9	6.2	5.8	-1.5
OK	52.3	49.0	5.6	5.2	-1.2
OR	57.2	53.1	6.5	6.3	5.3
PA	58.9	56.6	6.6	6.2	-2.8
RI	61.5	57.8	7.1	6.7	0.0
SC	51.1	47.8	5.8	5.3	-2.6
SD	48.1	47.4	6.3	5.9	-5.6
TN	50.3	49.4	5.2	4.6	-10.0
TX	58.8	58.0	5.7	5.3	-4.9
UT	53.0	49.5	8.0	7.6	2.1
VA	69.8	65.5	7.9	7.5	0.9
VT	54.8	51.7	7.7	7.5	3.0
WA	62.7	61.8	7.4	7.0	-4.0
WI	54.8	50.9	7.8	7.5	3.8
WV	46.2	43.3	4.2	3.6	-9.1
WY	51.7	51.1	7.1	6.8	-3.1
Total	58.0	55.1	6.6	6.2	-0.9

Source: Authors' calculations using CPS data. Notes: ¹ Percentage points.

Table A.4: Federal and State Compression (Select States)

	Gross 90/10 -Net 90/10 Federal ¹	Gross 90/10 -Net 90/10 State ¹	State as % Federal
AK	31.8	-0.3	-1.1%
AL	31.7	-5.1	-16.2%
AR	29.6	-3.5	-11.8%
AZ	30.6	-1.5	-4.8%
CA	34.4	1.6	4.8%
CO	30.0	2.2	7.4%
CT	31.4	0.6	1.9%
DC	35.8	1.5	4.2%
DE	30.3	3.5	11.6%
FL	30.3	-5.5	-18.1%
GA	32.4	1.2	3.7%
HA	28.8	3.5	12.1%
IA	26.9	2.0	7.6%
ID	28.6	0.9	3.2%
IL	33.0	-5.5	-16.8%
IN	29.1	-2.9	-10.1%
KS	30.4	1.2	3.9%
KY	30.5	-1.9	-6.1%
LA	31.6	-7.1	-22.4%
MA	33.6	1.4	4.2%
MD	30.0	2.3	7.5%
ME	29.2	1.0	3.5%
MI	33.0	0.1	0.4%
MN	29.0	5.2	18.1%
MO	30.1	-1.5	-5.1%
MS	29.5	-9.5	-32.2%
MT	27.6	2.4	8.6%
NC	31.0	0.0	0.0%
ND	27.6	-2.8	-10.2%
NE	27.5	1.5	5.4%
NH	28.1	-0.2	-0.8%
NJ	32.0	0.9	2.9%
NM	32.0	-1.4	-4.4%
NV	29.0	-3.5	-12.0%
NY	33.8	3.2	9.4%
OH	31.9	-1.5	-4.8%
OK	29.9	-1.2	-4.2%
OR	29.7	5.3	17.7%
PA	32.7	-2.8	-8.5%
RI	31.6	0.0	0.0%
SC	29.5	-2.6	-8.9%
SD	27.1	-5.6	-20.8%
TN	30.5	-10.0	-32.7%
TX	33.1	-4.9	-14.8%
UT	27.1	2.1	7.7%
VA	31.4	0.9	2.7%
VT	28.9	3.0	10.2%
WA	30.6	-4.0	-13.0%
WI	28.0	3.8	13.7%
WV	28.7	-9.1	-31.6%
WY	28.6	-3.1	-10.9%
Total	30.4	-0.9	-2.9%

Source: Authors' calculations using CPS data.
Notes: ¹ Percentage points. A full set of state results can be found in the online appendix.

Table A.5: State Compression: Gas Tax Analysis

	90th Percentile			10th Percentile			90/10	90/10	(7) - (8) ²
	Gross Inc.	Net Inc.	Net Inc. x Gas ¹	Gross Inc.	Net Inc.	Net Inc. x Gas ¹	Compression ²	Compression x Gas ^{1,2}	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
AK	68.2	68.2	68.3	8.2	8.1	8.2	-0.3	-0.0	-0.3
AL	50.8	48.5	48.6	4.8	4.4	4.5	-5.1	-2.7	-2.5
AR	46.1	43.4	43.6	4.9	4.5	4.6	-3.5	-1.0	-2.5
AZ	59.5	56.7	56.9	5.7	5.3	5.5	-1.5	0.6	-2.0
CA	70.3	65.4	65.6	6.2	5.9	6.0	1.6	2.8	-1.1
CO	65.6	62.3	62.5	7.7	7.5	7.6	2.2	3.4	-1.2
CT	73.5	70.0	70.2	8.9	8.5	8.6	0.6	1.6	-1.0
DC	86.7	78.8	79.1	4.9	4.6	4.7	1.5	4.2	-2.7
DE	60.4	57.2	57.5	8.2	8.0	8.2	3.5	4.8	-1.2
FL	57.8	57.2	57.3	6.0	5.6	5.7	-5.5	-4.1	-1.4
GA	57.5	54.1	54.2	5.9	5.7	5.7	1.2	2.0	-0.8
HA	65.1	60.0	60.1	7.4	7.0	7.1	3.5	4.3	-0.8
IA	51.0	48.0	48.2	7.3	7.0	7.1	2.0	3.1	-1.0
ID	49.9	46.2	46.5	6.5	6.1	6.2	0.9	2.4	-1.5
IL	62.5	59.6	59.8	6.5	5.8	5.9	-5.5	-4.1	-1.5
IN	52.9	50.5	50.7	6.7	6.2	6.3	-2.9	-1.5	-1.4
KS	55.0	51.8	52.0	6.9	6.5	6.6	1.2	2.5	-1.3
KY	50.8	47.8	47.9	4.8	4.4	4.5	-1.9	0.1	-2.0
LA	52.0	49.9	50.1	4.1	3.6	3.8	-7.1	-4.0	-3.1
MA	71.5	67.1	67.3	7.4	7.0	7.1	1.4	2.3	-0.9
MD	71.8	67.9	68.1	9.0	8.7	8.9	2.3	3.2	-1.0
ME	51.3	47.9	48.0	6.5	6.2	6.3	1.0	2.3	-1.3
MI	59.7	56.6	56.7	6.0	5.7	5.9	0.1	1.9	-1.8
MN	61.7	57.2	57.4	8.2	8.0	8.1	5.2	6.5	-1.3
MO	55.2	52.4	52.5	6.4	6.0	6.1	-1.5	-0.1	-1.4
MS	45.9	43.5	43.6	4.2	3.6	3.8	-9.5	-6.6	-2.9
MT	46.9	44.5	44.7	5.6	5.5	5.6	2.4	4.6	-2.2
NC	53.9	50.1	50.4	6.1	5.7	5.8	0.0	2.3	-2.3
ND	48.1	46.5	46.7	6.6	6.2	6.3	-2.8	-1.1	-1.7
NE	52.2	49.3	49.5	7.5	7.2	7.3	1.5	2.5	-1.1
NH	63.3	63.1	63.3	10.0	10.0	10.1	-0.2	0.3	-0.6
NJ	75.1	71.7	71.8	8.4	8.1	8.2	0.9	1.4	-0.5
NM	53.6	50.8	50.9	4.6	4.2	4.3	-1.4	0.4	-1.8
NV	58.5	57.6	57.9	7.6	7.3	7.4	-3.5	-2.1	-1.3
NY	66.6	62.2	62.3	5.3	5.1	5.2	3.2	4.7	-1.6
OH	55.7	52.9	53.1	6.2	5.8	5.9	-1.5	0.3	-1.8
OK	52.3	49.0	49.2	5.6	5.2	5.3	-1.2	0.6	-1.8
OR	57.2	53.1	53.3	6.5	6.3	6.5	5.3	6.6	-1.3
PA	58.9	56.6	56.8	6.6	6.2	6.3	-2.8	-1.3	-1.4
RI	61.5	57.8	58.1	7.1	6.7	6.8	0.0	1.7	-1.7
SC	51.1	47.8	47.9	5.8	5.3	5.4	-2.6	-0.6	-2.0
SD	48.1	47.4	47.6	6.3	5.9	6.0	-5.6	-3.8	-1.8
TN	50.3	49.4	49.6	5.2	4.6	4.8	-10.0	-7.2	-2.8
TX	58.8	58.0	58.3	5.7	5.3	5.5	-4.9	-3.2	-1.7
UT	53.0	49.5	49.7	8.0	7.6	7.7	2.1	3.0	-1.0
VA	69.8	65.5	65.6	7.9	7.5	7.6	0.9	1.9	-1.0
VT	54.8	51.7	51.9	7.7	7.5	7.6	3.0	3.7	-0.7
WA	62.7	61.8	62.1	7.4	7.0	7.2	-4.0	-2.5	-1.5
WI	54.8	50.9	51.1	7.8	7.5	7.7	3.8	5.3	-1.4
WV	46.2	43.3	43.5	4.2	3.6	3.7	-9.1	-5.8	-3.3
WY	51.7	51.1	51.2	7.1	6.8	6.9	-3.1	-2.3	-0.9
Total	58.0	55.1	55.3	6.6	6.2	6.4	-0.9	0.6	-1.5

Source: Authors' calculations using CPS data. Notes: ¹ Post-tax income excludes state gas taxes. ² Percentage points. All income data values are in \$1000s of 2000 dollars.

Table A.6: State Compression: Sales Tax Exemption Analysis (Selected States)

	90th Percentile				10th Percentile				90/10	90/10	90/10	(9)-(10) ³	(9)-(11) ³
	Gross Inc.	Net Inc.	Net Inc. no Ex. ¹	Net Inc. Full Ex. ²	Gross Inc.	Net Inc.	Net Inc. no Ex. ¹	Net Inc. Full Ex. ²	Compression ³	Compression No Ex. ^{1,3}	Compression Full Ex. ^{1,3}	(12)	(13)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
AK	68.2	68.2	68.2	68.2	8.2	8.1	8.1	8.1	-0.3	-0.3	-0.3	0.0	0.0
AL	50.8	48.5	48.5	48.7	4.8	4.4	4.4	4.5	-5.1	-5.1	-2.2	0.0	-2.9
AR	46.1	43.4	43.4	43.6	4.9	4.5	4.5	4.6	-3.5	-3.5	-0.4	0.0	-3.1
AZ	59.5	56.7	56.5	56.8	5.7	5.3	5.2	5.4	-1.5	-3.5	-1.0	2.0	-0.5
CA	70.3	65.4	65.1	65.5	6.2	5.9	5.8	5.9	1.6	-0.4	2.1	2.0	-0.5
CO	65.6	62.3	62.2	62.4	7.7	7.5	7.4	7.5	2.2	1.5	2.4	0.7	-0.2
CT	73.5	70.0	69.6	70.0	8.9	8.5	8.4	8.5	0.6	-0.9	0.7	1.5	-0.1
DC	86.7	78.8	78.4	78.9	4.9	4.6	4.4	4.6	1.5	-1.8	2.3	3.3	-0.8
DE	60.4	57.2	57.2	57.2	8.2	8.0	8.0	8.0	3.5	3.5	3.5	0.0	0.0
FL	57.8	57.2	56.9	57.2	6.0	5.6	5.4	5.6	-5.5	-7.7	-4.9	2.2	-0.6
GA	57.5	54.1	54.0	54.2	5.9	5.7	5.6	5.7	1.2	0.4	2.3	0.8	-1.1
HA	65.1	60.0	60.0	60.2	7.4	7.0	7.0	7.2	3.5	3.5	4.9	0.0	-1.5
IA	51.0	48.0	47.8	48.0	7.3	7.0	6.9	7.0	2.0	0.7	2.3	1.3	-0.3
ID	49.9	46.2	46.2	46.5	6.5	6.1	6.1	6.2	0.9	0.9	2.8	0.0	-1.9
IL	62.5	59.6	59.6	59.9	6.5	5.8	5.8	6.0	-5.5	-6.1	-3.4	0.6	-2.1
IN	52.9	50.5	50.3	50.6	6.7	6.2	6.1	6.2	-2.9	-4.6	-2.6	1.7	-0.4
KS	55.0	51.8	51.8	52.0	6.9	6.5	6.5	6.7	1.2	1.2	2.8	0.0	-1.6
KY	50.8	47.8	47.5	47.8	4.8	4.4	4.3	4.4	-1.9	-4.6	-1.2	2.8	-0.6
LA	52.0	49.9	49.9	50.1	4.1	3.6	3.6	3.7	-7.1	-8.2	-4.5	1.1	-2.6
MA	71.5	67.1	66.8	67.1	7.4	7.0	6.8	7.0	1.4	-0.8	1.4	2.2	0.0
MD	71.8	67.9	67.7	68.0	9.0	8.7	8.7	8.8	2.3	1.6	2.7	0.7	-0.5
ME	51.3	47.9	47.7	47.9	6.5	6.2	6.0	6.2	1.0	-0.9	1.5	1.9	-0.4
MI	59.7	56.6	56.3	56.6	6.0	5.7	5.6	5.8	0.1	-1.9	0.6	2.0	-0.5
MN	61.7	57.2	56.8	57.2	8.2	8.0	7.8	8.0	5.2	3.4	5.2	1.8	0.0
MO	55.2	52.4	52.4	52.6	6.4	6.0	6.0	6.1	-1.5	-1.5	0.5	0.0	-2.1
MS	45.9	43.5	43.5	43.8	4.2	3.6	3.6	3.9	-9.5	-9.5	-4.3	0.0	-5.2
MT	46.9	44.5	44.5	44.5	5.6	5.5	5.5	5.5	2.4	2.4	2.4	0.0	0.0
NC	53.9	50.1	50.1	50.3	6.1	5.7	5.6	5.7	0.0	-0.6	1.3	0.6	-1.3
ND	48.1	46.5	46.3	46.6	6.6	6.2	6.0	6.3	-2.8	-5.2	-2.2	2.4	-0.6
NE	52.2	49.3	49.1	49.4	7.5	7.2	7.1	7.3	1.5	0.5	1.7	1.0	-0.2
NH	63.3	63.1	63.1	63.1	10.0	10.0	10.0	10.0	-0.2	-0.2	-0.2	0.0	0.0
NJ	75.1	71.7	71.3	71.7	8.4	8.1	7.9	8.1	0.9	-0.8	0.9	1.8	0.0
NM	53.6	50.8	50.7	51.0	4.6	4.2	4.2	4.4	-1.4	-1.6	1.3	0.2	-2.7
NV	58.5	57.6	57.3	57.7	7.6	7.3	7.1	7.3	-3.5	-5.2	-3.1	1.8	-0.4
NY	66.6	62.2	62.0	62.2	5.3	5.1	5.0	5.1	3.2	1.2	3.5	1.9	-0.4
OH	55.7	52.9	52.7	52.9	6.2	5.8	5.7	5.8	-1.5	-3.4	-1.1	1.8	-0.5
OK	52.3	49.0	49.0	49.2	5.6	5.2	5.2	5.3	-1.2	-1.2	0.9	0.0	-2.1
OR	57.2	53.1	53.1	53.1	6.5	6.3	6.3	6.3	5.3	5.3	5.3	0.0	0.0
PA	58.9	56.6	56.2	56.6	6.6	6.2	6.0	6.2	-2.8	-5.2	-2.8	2.5	0.0
RI	61.5	57.8	57.5	57.8	7.1	6.7	6.4	6.7	0.0	-2.9	0.0	2.9	0.0
SC	51.1	47.8	47.7	48.0	5.8	5.3	5.2	5.4	-2.6	-2.7	-0.0	0.1	-2.6
SD	48.1	47.4	47.4	47.6	6.3	5.9	5.9	6.0	-5.6	-5.6	-3.5	0.0	-2.2
TN	50.3	49.4	49.4	49.7	5.2	4.6	4.6	4.8	-10.0	-10.0	-6.3	0.0	-3.7
TX	58.8	58.0	57.8	58.1	5.7	5.3	5.2	5.4	-4.9	-7.2	-4.3	2.3	-0.6
UT	53.0	49.5	49.5	49.7	8.0	7.6	7.6	7.7	2.1	2.1	3.2	0.0	-1.1
VA	69.8	65.5	65.5	65.7	7.9	7.5	7.5	7.6	0.9	0.9	2.2	0.0	-1.3
VT	54.8	51.7	51.5	51.7	7.7	7.5	7.4	7.5	3.0	1.4	3.2	1.5	-0.2
WA	62.7	61.8	61.5	61.9	7.4	7.0	6.9	7.1	-4.0	-5.7	-3.6	1.7	-0.4
WI	54.8	50.9	50.7	51.0	7.8	7.5	7.4	7.6	3.8	2.6	4.2	1.3	-0.3
WV	46.2	43.3	43.2	43.5	4.2	3.6	3.5	3.7	-9.1	-9.8	-5.4	0.7	-3.7
WY	51.7	51.1	51.1	51.2	7.1	6.8	6.8	6.9	-3.1	-3.2	-1.9	0.0	-1.2
Total	58.0	55.1	54.9	55.2	6.6	6.2	6.2	6.3	-0.9	-1.9	0.2	1.0	-1.1

Source: Authors' calculations using CPS data. Notes: ¹ Post-tax income excludes state sales tax exemptions. ² Post-tax income assume food and clothing are exempt from sales taxes in all states. ³ Percentage points. All income data values are in \$1000s of 2000 dollars.