# Online Appendix

Behavioral Responses to State Income Taxation of High Earners: Evidence from California

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APPENDIX A. SUPPLEMENTAL FIGURES AND TABLES
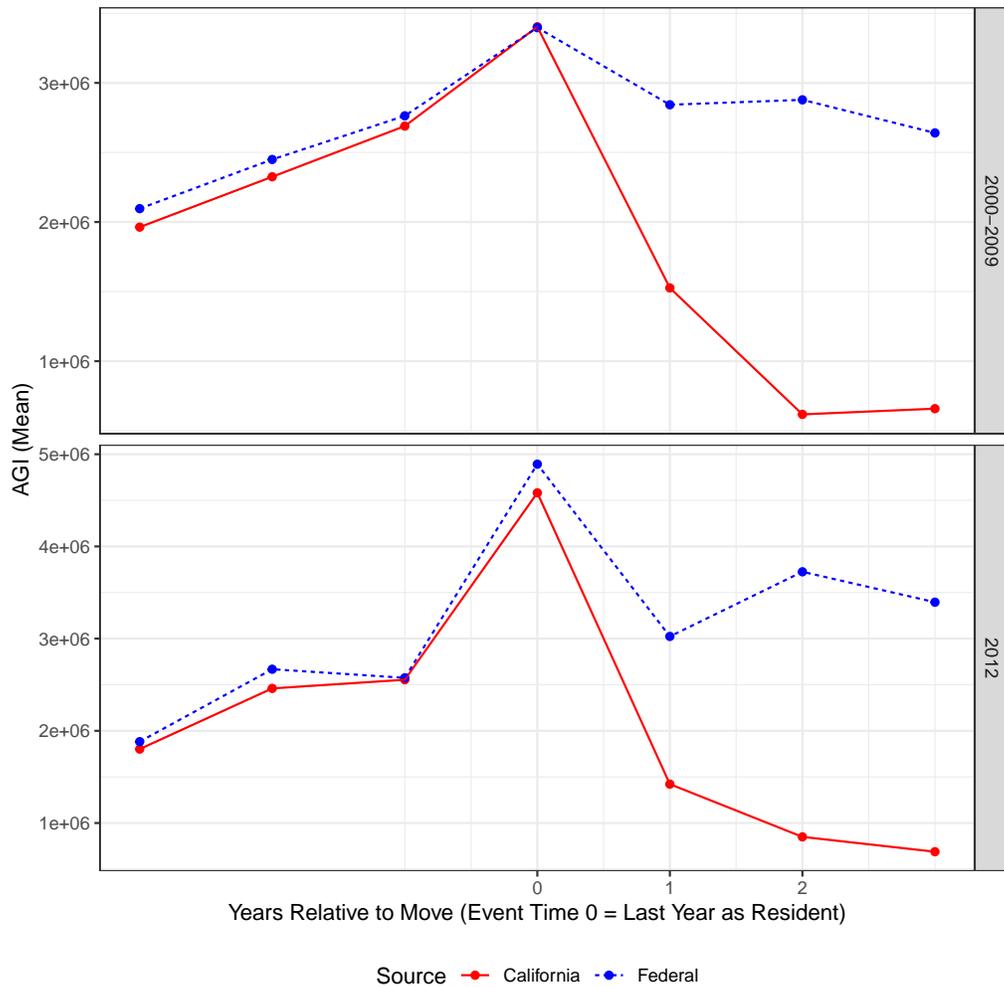
FIGURE A1. AGI DYNAMICS OF TOP-BRACKET RESIDENT FILTER TO 2X NON-RESIDENT/PARTIAL YEAR FILER (LEVELS)

Note: The sample is all taxpayers who displayed a Resident - NR - NR transition, where in the "Resident" year the taxpayer was in the top tax bracket according to 2012 tax policy.
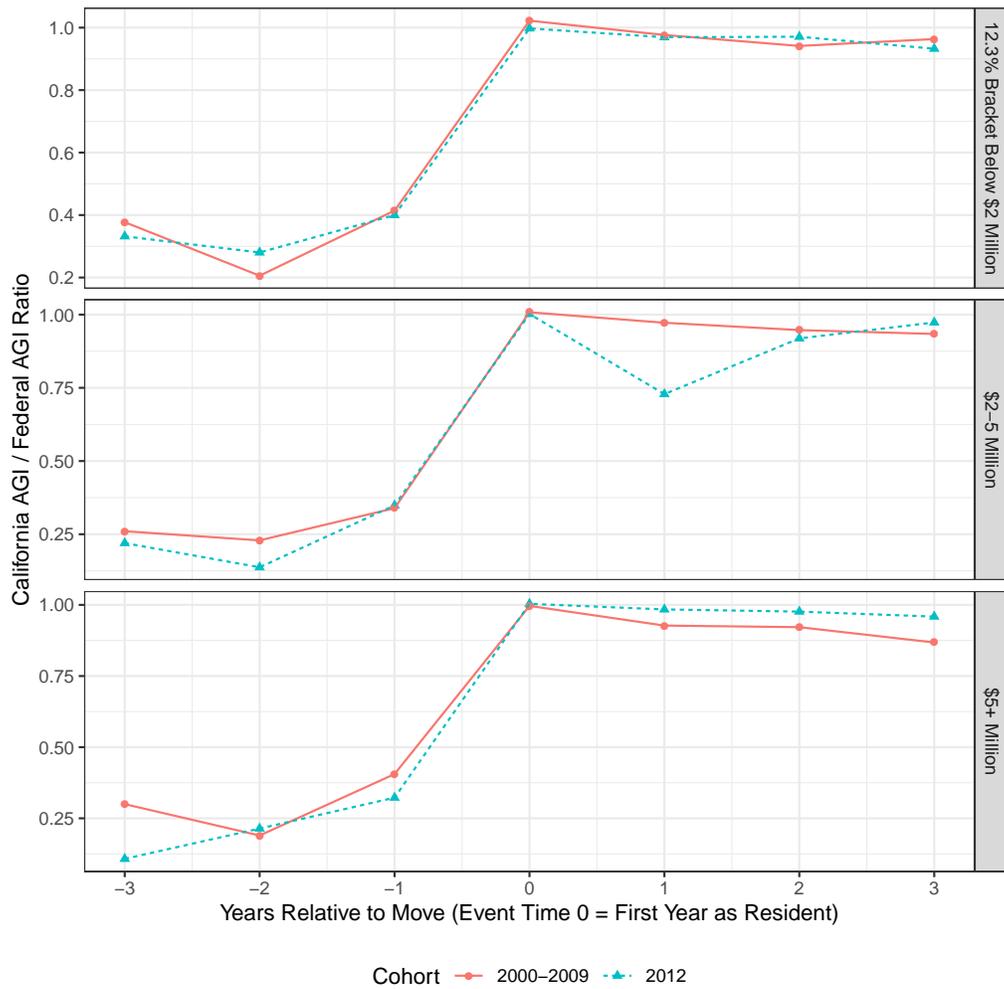
FIGURE A2. HOW MUCH INCOME ENTERS CALIFORNIA WITH IN-MIGRANTS?

Note: The sample is all taxpayers who displayed a Resident - NR - NR transition, where in the "Resident" year the taxpayer was in the top tax bracket according to 2012 tax policy.

FIGURE A3. 2012-13 CALIFORNIA AVERAGE RATE INCREASES RELATIVE TO OTHER STATES, $5+ MILLION EARNERS

Note: This map shows the Proposition 30-driven incremental savings in average taxes paid from moving out of California from years 2012-13. Note: Kansas is omitted as it dropped rates substantially from 2012-13, leading to large value (around 3) which would obscure the variation in other values. See Section IV.A for a full discussion of this figure.
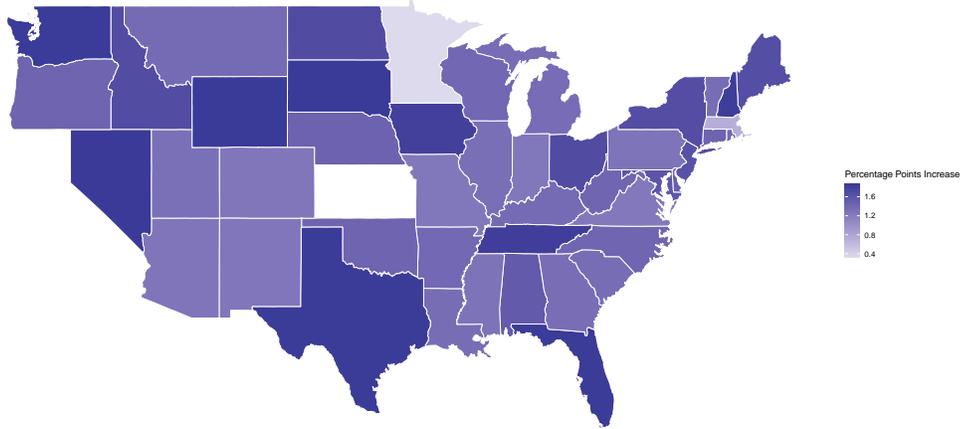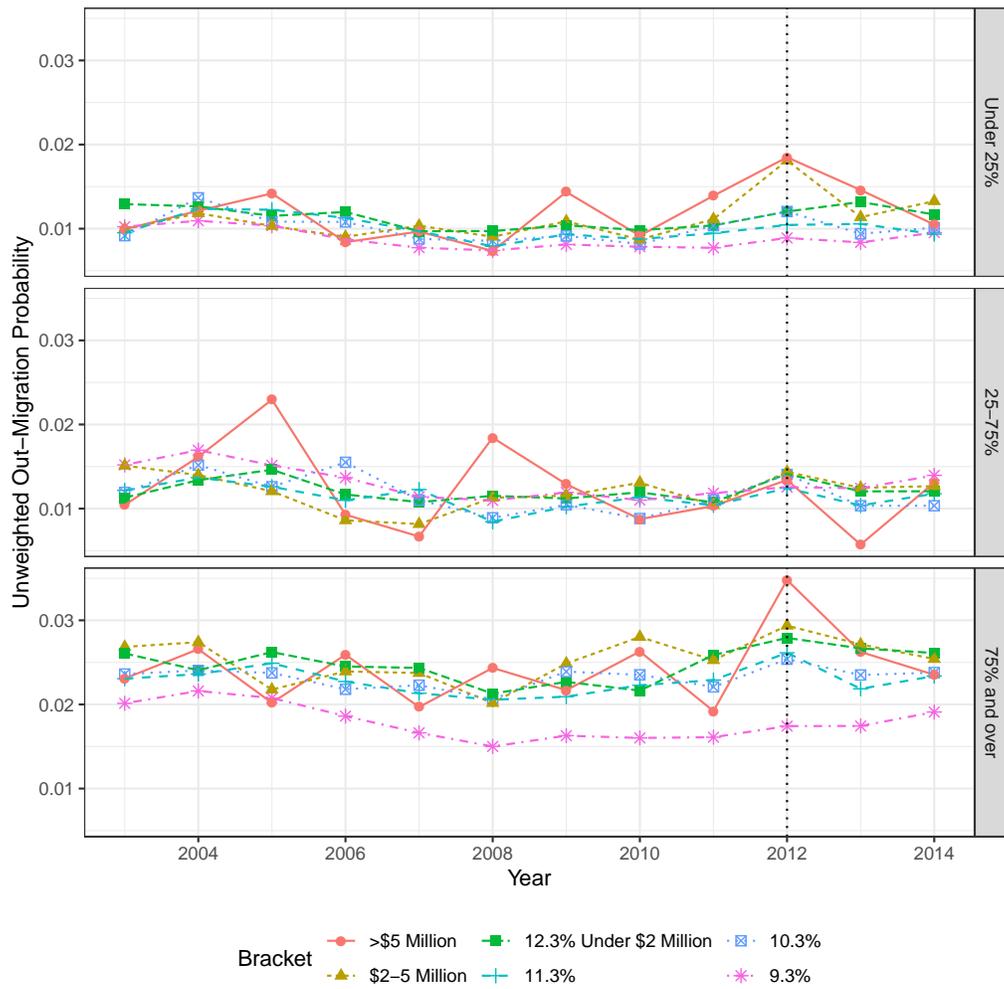
Figure A4. Out-Migration Probabilities, Wage Composition

Note: This figure shows the out-migration probability of the specific income brackets by wage share from 2000-2014.
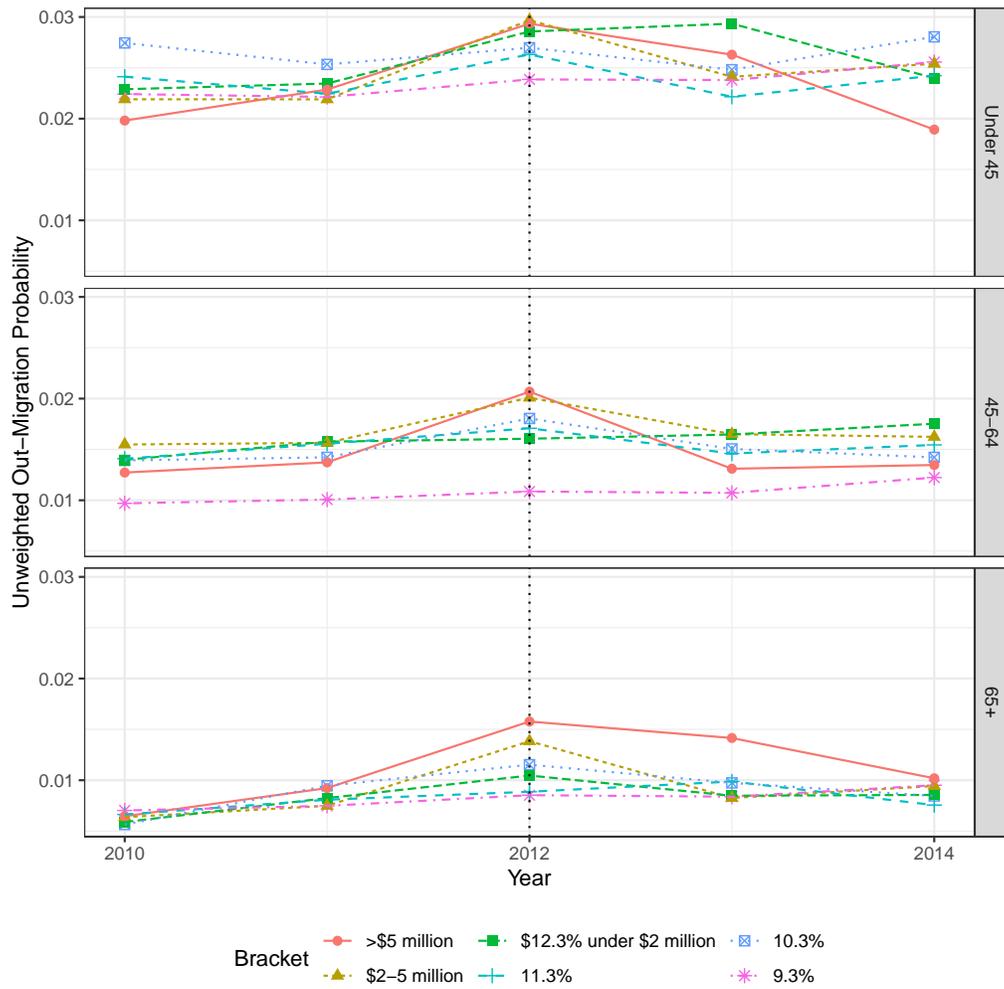
FIGURE A5. OUT-MIGRATION PROBABILITIES, AGE

Note: This figure shows the out-migration probability by age group from 2010-2014.
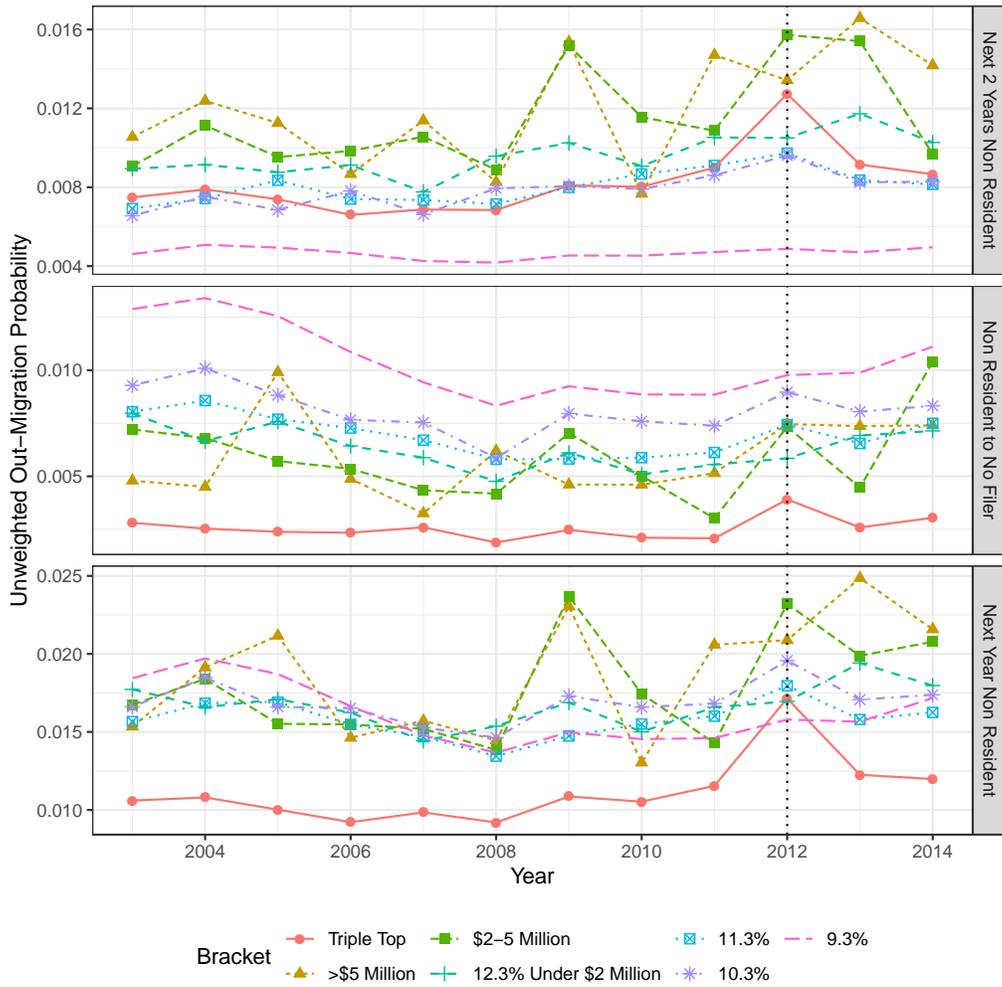
FIGURE A6. OUT-MIGRATION PROBABILITIES, TOP BRACKET PERSISTENCE

Note: This figure shows the rate of out-migration among residents who are persistently in the given income bracket over the period $t-2$ to t (that is, not only the current year but also the past two years). "Triple top" refers to taxpayers who were in the top bracket (12.3% marginal income tax rate) in each of the three years from $t-2$ to t.
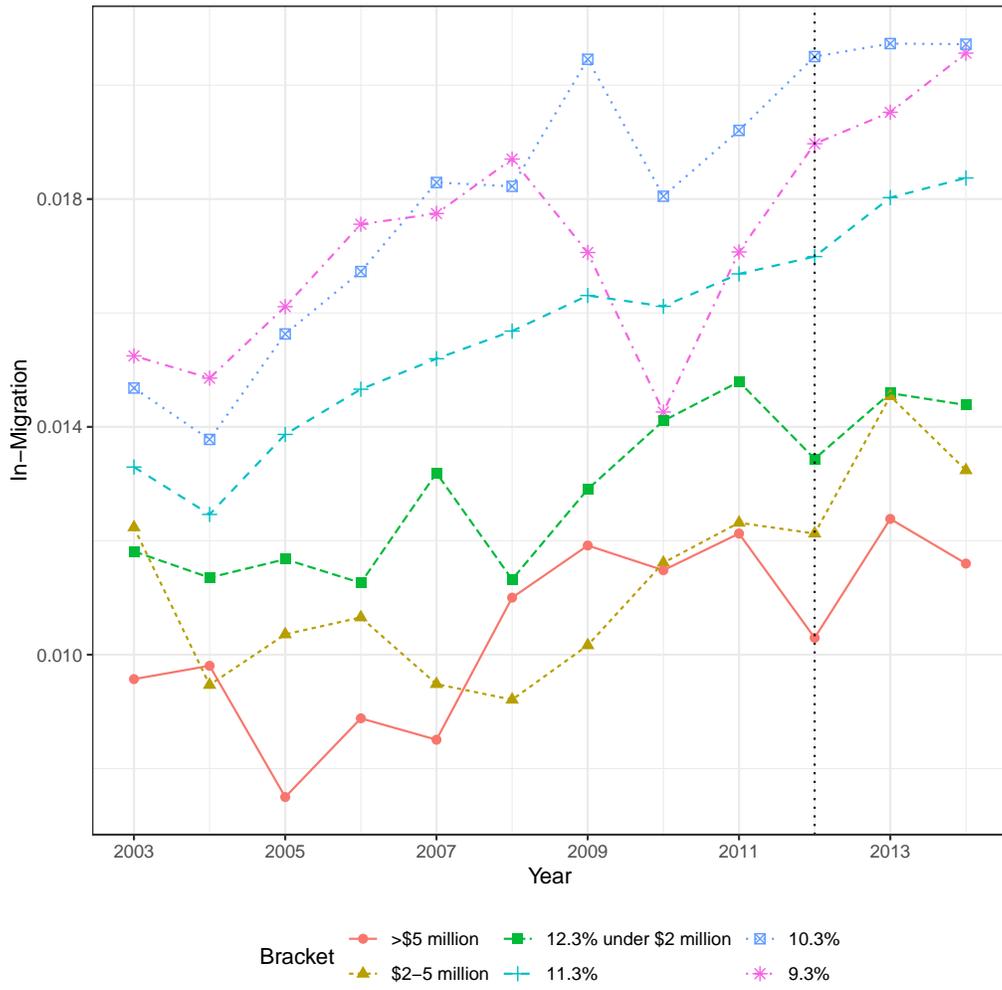
FIGURE A7. IN-MIGRATION

Note: This figure shows the in-migration share of the specific income brackets.
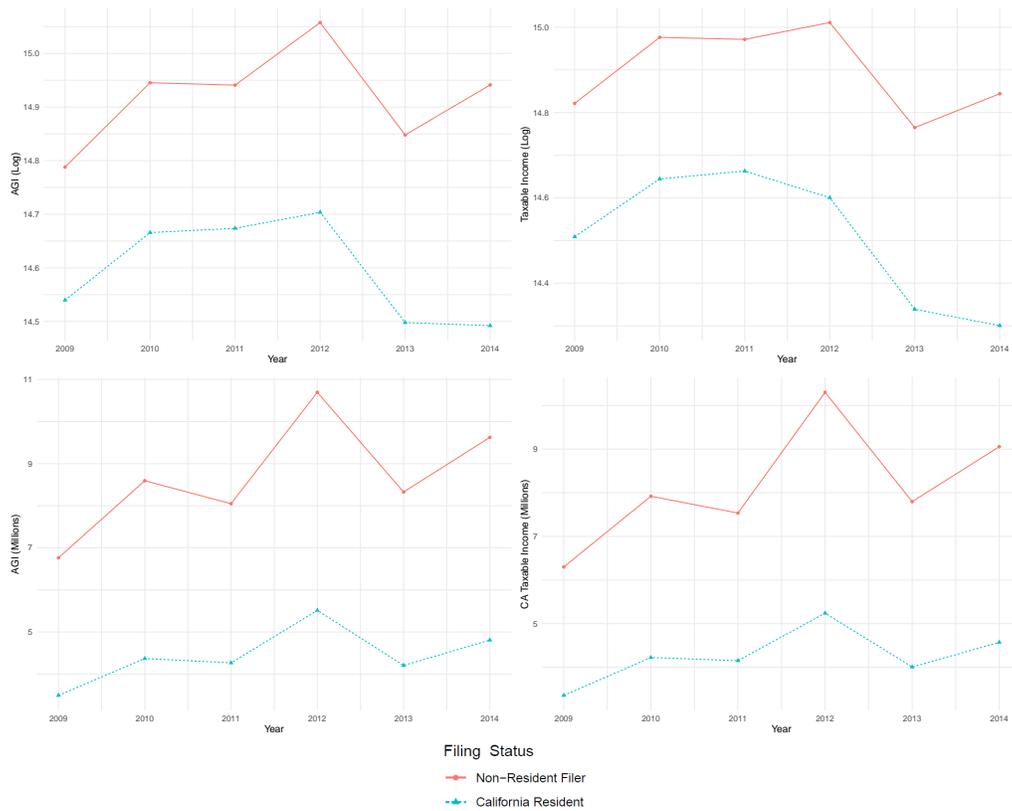
FIGURE A8. RAW DIFFERENCE-IN-DIFFERENCE TRENDS

Note: These figures show the raw plots of the differences-in-differences for levels and logs of taxable income. The "control group" is defined as those taxpayers who file non-resident returns in California in every year from 2009 to 2014, and whose inflation-adjusted California taxable income would have placed them in the top California bracket (as introduced under Proposition 30) for 2009-11. As is evident in this figure, non-resident filers in the control group display substantially higher earnings than do residents.
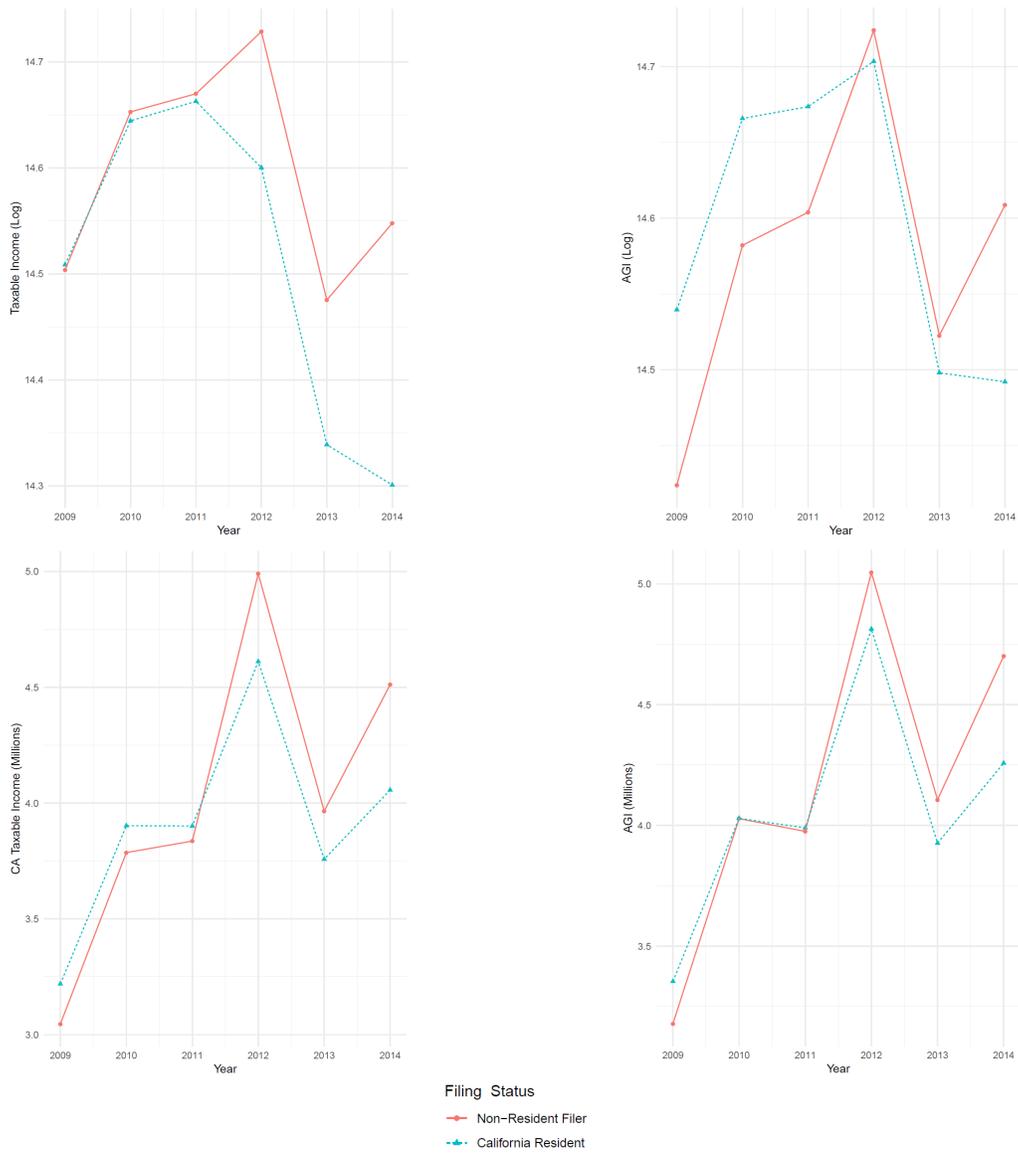
FIGURE A9. MATCHED SAMPLE INCOME TRENDS

Note: This figure shows annual group averages for both logs and levels of AGI and Taxable Income. The matching procedure only matches on average levels of income across 2009-2010. Therefore, neither parallel trends in 2009-2010 and nor their continuation in 2011 is an artifact of our matching procedure.
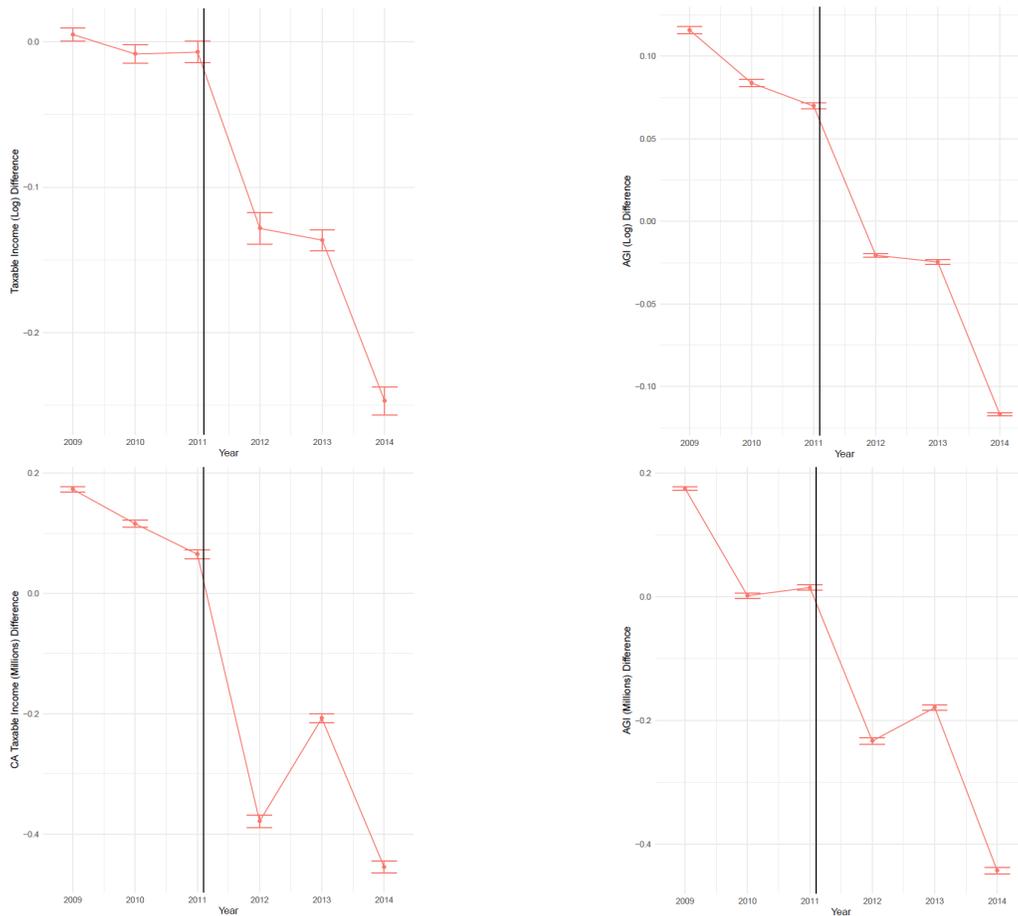
FIGURE A10. INCOME TREND DIFFERENCES BETWEEN CALIFORNIA RESIDENTS AND MATCHED NON-RESIDENT FILERS

Note: This figure shows income differences between California resident and matched non-resident filer annual group averages, with error bands showing plus and minus two standard errors of the mean. The matching procedure only matches on average levels of income across 2009-2010. Therefore, neither parallel trends in 2009-2010 and nor their continuation in 2011 is an artifact of our matching procedure.

Year	Inflation Factor (Percent)
2000-01	5.3
2001-02	1.5
2002-03	2.2
2003-04	3.1
2004-05	2.8
2005-06	4.8
2006-07	3.1
2007-08	5.0
2008-09	-1.5
2009-10	0.9
2010-11	2.7
2011-12	1.9
2012-13	1.7
2013-14	2.2
2014-15	1.3
2015-16	2.1

Note: This table shows the annual increase in the California Consumer Price Index (CCPI) as defined in the Revenue and Taxation Code.

TABLE A2—OUT-MIGRATION SUMMARY STATISTICS, 2000-09

Income Bin	Percentage Chance of Next-Year Non Resident Filing		
	All	To Non-Filer	To Non-Resident Filer
>$5 Million	1.524	0.467	1.012
$2-5 Million	1.521	0.567	0.905
12.3% Under $2 Million	1.590	0.663	0.859
11.3%	1.597	0.795	0.726
10.3%	1.712	0.911	0.710
9.3%	1.682	1.134	0.439

Note: This table reports the percentage likelihood of different modes of out-migration, disaggregated by income bins reported in 2015 dollars. The calculations omit taxpayers who in the next year file as a non-resident, only to file again as a resident in the subsequent year (these are not quantitatively important). Out-migration rates are unweighted.

Table A3—Increase in Average Log Net-of-Tax Rate Differences, 2012-13

Income Bin	Only Prop 30	Prop 30 + Federal Tax Increase		
		Zero Tax States	Non-Zero Tax States	Tax Cuts
10.3% Bracket	.0039	-.0066	-.0026	.0097
11.3% Bracket	.0100	.0060	.0037	.0150
12.3% Bracket	.0202	.0296	.0190	.0311
$2-5 Million	.0296	.0450	.0288	.0421
$5+ Million	.0363	.0504	.0340	.0457

Note: This table proceeds identically to Table 2, calculating changes in the tax rate differences between California and other states. The difference compared to Table 2 is that we use the log net of tax average rate. See note to Table 2 for explanation.

TABLE A4—AVERAGE CALIFORNIA AGI / FEDERAL AGI

Year	File as Non Resident in 2011	File as Resident in 2011
2009	0.075	0.996
2010	0.067	1.01
2011	0.065	1.02
2012	0.048	0.998
2013	0.056	0.999
2014	0.058	0.982

Note: This table shows the average ratio California AGI to Federal AGI for non-residents and residents respectively, as of 2011.

	Marital Status			
	All	Single	Married	HoH
	(1)	(2)	(3)	(4)
12.3% Bracket Under 2 Million				
1{2011}	0.002***	0.004**	0.001	0.006
	(0.001)	(0.001)	(0.001)	(0.003)
1{2012}	0.003***	0.004***	0.002**	0.005
	(0.001)	(0.001)	(0.001)	(0.003)
1{2013}	0.003***	0.004***	0.002*	0.005
	(0.001)	(0.001)	(0.001)	(0.003)
2-5 Million				
1{2011}	0.002	0.006	0.001	−0.001
	(0.001)	(0.003)	(0.001)	(0.006)
1{2012}	0.006***	0.008*	0.006***	0.001
	(0.001)	(0.003)	(0.001)	(0.006)
1{2013}	0.002	0.004	0.002	0.004
	(0.001)	(0.003)	(0.001)	(0.007)
5 Million +				
1{2011}	0.002	0.002	0.002	−0.005
	(0.002)	(0.005)	(0.002)	(0.007)
1{2012}	0.007***	0.012*	0.006**	0.009
	(0.002)	(0.005)	(0.002)	(0.010)
1{2013}	0.002	−0.001	0.003	0.012
	(0.002)	(0.004)	(0.002)	(0.012)
Observations	43,851,430	19,146,163	22,150,819	2,554,448
R^2	0.001	0.0001	0.0003	0.0002
Adjusted R^2	0.001	0.0001	0.0003	0.0001

Note: *p<0.05; **p<0.01; ***p<0.001

| | Next Year Non Resident | | | |
	(1)	(2)	(3)	(4)
12.3% Bracket				
1{2012}	0.008**	0.009***	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Los Angeles ×**1**{2012}			0.013*	0.013*
			(0.006)	(0.006)
San Diego ×**1**{2012}			0.015**	0.015**
			(0.006)	(0.006)
San Jose ×**1**{2012}			0.002	0.002
			(0.004)	(0.004)
Observations	17,363,286	17,363,286	17,363,286	17,363,286
R^2	0.001	0.001	0.001	0.001
Adjusted R^2	0.001	0.001	0.001	0.001

Note: Regressions include years 2000-2014 but also exclude all taxpayers below the 9.3% bracket. All specifications contain marital status and year fixed effects. 2000-2010 is the pre-period, and difference-in-differences effects are estimated for years 2011-14. Standard errors are clustered by taxpayer and location. Income controls include log income and fixed effects for 100 income percentiles. Regressions weighted by taxable income. Baseline is San Francisco county-region. Location based on year $t-1$ county. $t-1$ is used because as of filing for year t, many taxpayers are already out of California and filing from another state.
*p<0.05; **p<0.01; ***p<0.001

	Move to:				
	All	Zero-Tax States	Low-Tax States	Medium-Tax States	High-Tax States
	(1)	(2)	(3)	(4)	(5)
12.3%					
Under 2 Million					
2011	0.002***	0.001*	0.0004	−0.0000	0.0001
	(0.001)	(0.0003)	(0.0003)	(0.0002)	(0.0003)
2012	0.003***	0.001***	0.001**	−0.0002	0.0004
	(0.001)	(0.0004)	(0.0003)	(0.0001)	(0.0003)
2013	0.003***	0.001**	0.001***	−0.0000	−0.0001
	(0.001)	(0.0004)	(0.0003)	(0.0002)	(0.0003)
2-5 Million					
2011	0.002	0.0003	0.001	−0.0002	0.001
	(0.001)	(0.001)	(0.001)	(0.0003)	(0.0005)
2012	0.006***	0.004***	0.001*	−0.0003	0.0003
	(0.001)	(0.001)	(0.001)	(0.0002)	(0.0004)
2013	0.002	0.001*	0.0001	−0.0001	0.0001
	(0.001)	(0.001)	(0.0005)	(0.0003)	(0.0004)
5+ Million					
2011	0.002	0.002	−0.001	−0.001**	−0.0005
	(0.002)	(0.001)	(0.001)	(0.0002)	(0.001)
2012	0.007***	0.005***	0.001	0.0004	−0.0001
	(0.002)	(0.001)	(0.001)	(0.0004)	(0.001)
2013	0.002	0.0004	0.001	−0.001*	0.0001
	(0.002)	(0.001)	(0.001)	(0.0003)	(0.001)
Observations	44,047,789	44,047,789	44,047,789	44,047,789	44,047,789
R^2	0.001	0.0001	0.0002	0.00004	0.0003
Adjusted R^2	0.001	0.0001	0.0002	0.00004	0.0003

Note: This table shows unweighted movement regressions with destination heterogeneity.
*p<0.05; **p<0.01; ***p<0.001

TABLE A8—OUT-MIGRATION SUMMARY STATISTICS, 2000-09, DESTINATION HETEROGENEITY

	Percentage Chance of Next-Year Non Resident Filing			
Income Bin	Zero-Tax	Low-Tax	High-Tax	Super High-Tax
>$5 Million	0.424	0.331	0.109	0.234
$2-5 Million	0.391	0.356	0.112	0.224
12.3% Under $2 Million	0.373	0.359	0.100	0.269
11.3%	0.343	0.359	0.105	0.267
10.3%	0.357	0.435	0.098	0.273
9.3%	0.364	0.517	0.107	0.234

Note: This table reports that the baseline rates of migration from California to various types of states. These figures supply the necessary ingredients for the numerator of the elasticity calculations.

TABLE A9—MATCHED DIFFERENCE-IN-DIFFERENCES: MAIN ESTIMATE

	Dependent Variable			
	log(Taxable Income + 1)	Taxable Income (Millions)	log(Fed. AGI + 1)	Fed. AGI (Millions)
	(1)	(2)	(3)	(4)
Resident × 2011	−0.005	−0.079	−0.014	−0.046
	(0.008)	(0.065)	(0.009)	(0.079)
Resident × 2012	−0.134***	−0.522***	−0.097***	−0.340***
	(0.023)	(0.096)	(0.012)	(0.095)
Resident × 2013	−0.174***	−0.357***	−0.117***	−0.297***
	(0.034)	(0.077)	(0.014)	(0.084)
Resident × 2014	−0.282***	−0.599***	−0.194***	−0.546***
	(0.035)	(0.092)	(0.015)	(0.098)
Threshold Parallel Trend M	0.062	0.164	0.054	—
Observations	178,782	178,782	177,416	178,782
R^2	0.447	0.702	0.729	0.707
Adjusted R^2	0.336	0.642	0.675	0.649

Note: All regressions include taxpayer fixed effects. California residents are weighted to 1. The California non-resident control group has weights applied with mean 1 and reflecting matched sample with replacement. 2009-10 is the pre-period. Levels variables are winsorized at 99.5%. Standard errors are clustered by taxpayer. "Taxable Income" is under the California definition. That is, for California residents it is their California taxable income. For California non-residents, it is the taxable income of the taxpayer if they were a California resident and their full income were subject to California state taxation. "Threshold Parallel Trend M" is defined as the highest value of M in the Rambachan-Roth (2020) procedure for which the entire 95% confidence interval for the 2012 treatmen lies below zero, with values of $M¿0$ reflecting robustness even to the possibility of nonlinear departure from parallel trends. The 95% confidence interval for the 2012 treatment at $M=0$ (allowing for linear violation of parallel trends) for the Federal AGI level is [-0.399, 0.037].
*p<0.05; **p<0.01; ***p<0.001

	log(Taxable Income + 1)	Taxable Income (Millions)	log(Fed. AGI + 1)	Fed. AGI (Millions)
		Dependent Variable		
	(1)	(2)	(3)	(4)
Resident × 2009	0.012	0.110	0.029**	0.144
	(0.009)	(0.067)	(0.009)	(0.078)
Resident × 2010	−0.002	0.049	−0.002	−0.051
	(0.008)	(0.068)	(0.008)	(0.083)
Resident × 2012	−0.129***	−0.442***	−0.084***	−0.293**
	(0.021)	(0.086)	(0.010)	(0.091)
Resident × 2013	−0.169***	−0.278***	−0.103***	−0.250**
	(0.030)	(0.071)	(0.012)	(0.082)
Resident × 2014	−0.277***	−0.519***	−0.180***	−0.500***
	(0.031)	(0.081)	(0.014)	(0.093)
Observations	178,782	178,782	177,416	178,782
R^2	0.447	0.702	0.729	0.707
Adjusted R^2	0.336	0.642	0.675	0.649

Note: In this table, we present the results of the dynamic event study specification shown in equation 8. In this specification, the omitted year is the year before the treatment, and the test for deviation from would show opposite signed and significant coefficients.
*p<0.05; **p<0.01; ***p<0.001

TABLE A11—INCREASE IN AVERAGE TAX RATE DIFFERENCE BETWEEN CALIFORNIA AND OTHER STATES, 2017-18

Income Bin	Increase in Average Tax Difference, California vs. Zero-Tax States
10.3% Bracket	0.0197
11.3% Bracket	0.0261
12.3% Bracket under $2 Million	0.0362
$2-5 Million	0.0440
$5 Million +	0.0485

Note: This table repeats the exercise of Table 2, but computes how the 2018 CA-other state gap in average taxes paid grew over and above the 2017 CA-other state gap. The gap is reported only for the case of zero-tax states, that is states with zero state income tax. This is the same group as in the prior exercise, with the exception of Wyoming which changed policy between 2017-18. This group is as follows: Alaska, Florida, Nevada, Texas, South Dakota, and Washington. Taxpayer behavior is still fixed at year 2012, with inflation-indexed levels.

APPENDIX B. COMPONENTS OF TAXABLE INCOME

This section summarizes IRS Form 1040 (Federal) and California FTB form 540 (California). The income stems start with Federal AGI. Subtract "California subtractions" and add "California additions"; this gives California AGI. Then, we have

$$\text{Taxable Income} = (\text{California AGI - California Deductions})^+$$

In the following we describe how Federal AGI is constructed, from an intermediate quantity known as Total Income. Note our data contain Taxable Income, California wages, Federal AGI, and California deductions for the universe of California tax returns.

B1.   Components of Total Income

Variable	Data
Federal Wages	Partial
Interest	Full
Dividends	Full
Taxable refunds, credits, or offsets of state and local income taxes	(Not Contained)
Alimony Received	Partial
Business Income	Partial
Capital Gains (Losses)	Full
Other Gains (Losses)	Partial
IRA Distributions	Partial
Rental Real Estate, Royalties, Partnerships, S-Corps, trusts, etc.	Partial
Farm Income (Loss)	Partial
Unemployment Compensation	Partial
Social Security Benefits	Partial
Other Income	Partial

B2.   Total Income to Federal AGI: Subtractions

Variable	Data
Educator Expenses	Partial
Certain business expenses	Partial
Health savings account deduction	Partial
Moving expenses	Partial
Deductible part of self-employment tax	Partial
Self-employed SEP, SIMPLE, and qualified plans	Partial
Self-employed health insurance deduction	Partial
Penalty on early withdrawal of savings	Partial
Alimony paid	(Not Included)
IRA deduction	Partial
Student loan interest deduction	Partial
Tuition and Fees	Partial
Domestic production activities deduction	Partial