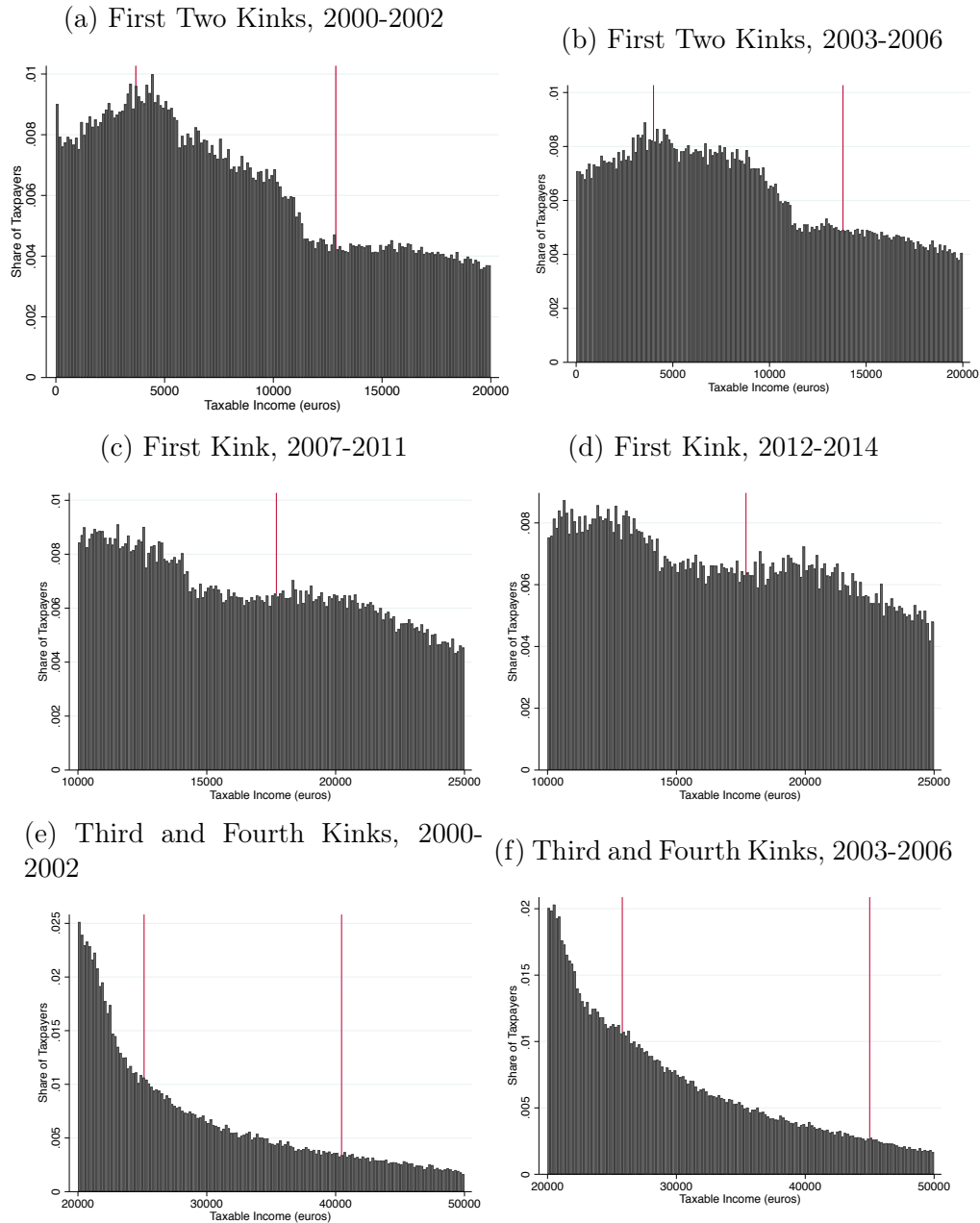


Appendix Figures

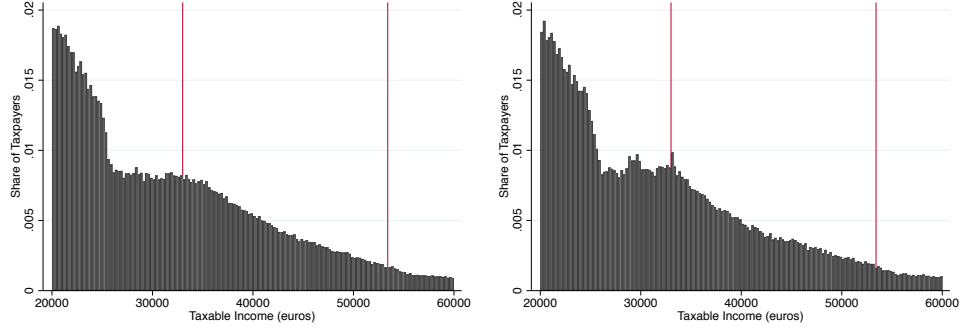
Figure A.1: Bunching Evidence at Kinks



Notes: these figures show the taxable income distribution (in nominal euros) around several kinks at low and middle income levels created by the Spanish personal income tax schedule over the period 2000-2014. A kink is defined as the taxable income threshold where taxpayers face a change in their marginal tax rate. The distributions pool yearly data for different periods of time when the tax schedule is identical across these fiscal years. To compute the share of taxpayers in each bin of taxable income, we elevate each observation included in the sample using the sampling weight reported in the data. The bins of taxable income are €200 wide. The graphs show that there is no significant bunching at any of the kinks in the taxable income distribution over the period 2000-2014.

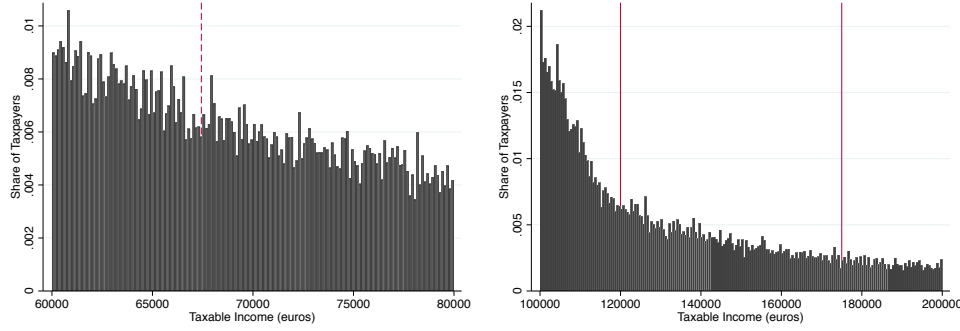
Figure A.2: Bunching Evidence at Kinks

(a) Second and Third Kinks, 2007-2011 (b) Second and Third Kinks, 2012-2014

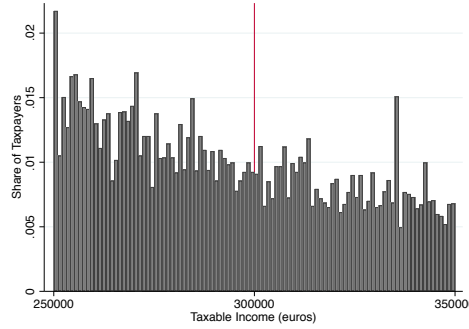


(c) Fifth Kink, 2000-2002

(d) Fourth and Fifth Kinks, 2011-2014



(e) Sixth Kink, 2011-2014



Notes: these figures show the taxable income distribution (in nominal euros) around several kinks at middle and high income levels created by the Spanish personal income tax schedule over the period 2000-2014. A kink is defined as the taxable income threshold where taxpayers face a change in their marginal tax rate. The distributions pool yearly data for different periods of time when the tax schedule is identical across these fiscal years. To compute the share of taxpayers in each bin of taxable income, we elevate each observation included in the sample using the sampling weight reported in the data. The bins of taxable income are €200 wide, except for panel (e) where the bin width is €500 and panel (f) where it is €1,000. The graphs show that there is no significant bunching at any of the kinks in the taxable income distribution over the period 2000-2014.

Appendix Tables

Table A.1: Tax Calculator Accuracy Rates

Year	General Tax Base		Special or Savings Tax Base	
	Taxable Income	Tax Liability	Taxable Income	Tax Liability
1999	99.0%	98.2%	99.9%	99.8%
2000	99.5%	98.9%	100.0%	100.0%
2001	99.3%	98.6%	100.0%	100.0%
2002	99.3%	98.4%	100.0%	100.0%
2003	97.8%	98.3%	100.0%	100.0%
2004	98.7%	98.5%	100.0%	100.0%
2005	98.0%	98.6%	100.0%	100.0%
2006	97.8%	98.7%	100.0%	100.0%
2007	100.0%	99.0%	100.0%	100.0%
2008	100.0%	98.9%	99.5%	99.6%
2009	100.0%	98.9%	100.0%	100.0%
2010	100.0%	98.8%	100.0%	100.0%
2011	100.0%	98.8%	100.0%	100.0%
2012	100.0%	98.7%	100.0%	99.5%
2013	100.0%	98.6%	100.0%	99.6%
2014	100.0%	97.7%	100.0%	99.5%

Notes: this table reports the percentage of cases in which taxable income and tax liability calculated with our tax calculator is within two percent of the actual values recorded in the administrative panel dataset of tax returns. As can be seen in the table, the accuracy rates are a bit higher for taxable income compared to tax liability, and also for the period 2007-2014 compared to 1999-2006. In any case, all accuracy rates are very high, with the lowest value at 97.7 percent.

Table A.2: ETI Estimates including Lagged Splines

	Gruber-Saez		Kleven-Schultz		Weber	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln(1 - \tau)$	0.408*** (0.015)	0.409*** (0.015)	0.627*** (0.019)	0.627*** (0.019)	0.644*** (0.036)	0.628*** (0.036)
$\Delta \ln(v)$			0.041*** (0.001)	0.041*** (0.001)		
Observations	3,440,136	3,440,136	3,133,430	3,133,430	2,983,196	2,983,196
Diff-in-Sargan p-value	0.00	0.00	0.00	0.00	0.23	0.20
Base-Year Splines	Lag Cubic	Lag Log	Lag Cubic	Lag Log	Lag Cubic	Lag Log
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: this table reports the elasticity of taxable income (ETI) for the period 1999-2014 including lagged splines in order to capture potential heterogeneous trends in income across groups of taxpayers during the sample period. Columns 1-2 report the estimates of the ETI applying the Gruber-Saez estimation method under two alternatives: lagged cubic splines (column 1) and lagged log splines (column 2). Columns 3-4 report the estimates of the ETI using the method from Kleven and Schultz (2014) under two alternatives: lagged cubic splines (column 3) and lagged log splines (column 4). Columns 5-6 report the estimates of the ETI using the method from Weber (2014) under two alternatives: lagged cubic splines (column 5) and lagged log splines (column 6). Standard errors clustered by taxpayer are reported in parentheses. All specifications include regional and year fixed-effects as well as controls for age, age squared, gender and indicators for joint filing, children, ascendants and the type of taxpayer according to her main source of income (employee, self-employed, saver or taxpayers with other main source of income such as capital gains). Observations in all regressions are weighted by log base-year taxable income. Significance levels: *** = 1%, ** = 5%, and * = 10%.

Table A.3: ETI Estimates in the Balanced Panel

	Gruber-Saez		Kleven-Schultz		Weber	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln(1 - \tau)$	0.382*** (0.020)	0.399*** (0.020)	0.601*** (0.032)	0.622*** (0.032)	0.447*** (0.047)	0.445*** (0.047)
$\Delta \ln(v)$			0.051*** (0.003)	0.052*** (0.003)		
Observations	1,181,998	1,181,998	1,068,836	1,068,836	1,000,069	1,000,069
Diff-in-Sargan p-value	0.00	0.00	0.00	0.00	0.36	0.36
Base-Year Splines	Cubic	Log	Cubic	Log	Lag Cubic	Lag Log
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: this table reports the elasticity of taxable income (ETI) for the period 1999-2014 using the balanced panel of taxpayers included in the sample. Columns 1-2 report the estimates of the ETI applying the Gruber-Saez estimation method under two alternatives: cubic splines (column 1) and log splines (column 2). Columns 3-4 report the estimates of the ETI using the method from Kleven and Schultz (2014) under two alternatives: cubic splines (column 3) and log splines (column 4). Columns 5-6 report the estimates of the ETI using the method from Weber (2014) under two alternatives: lagged cubic splines (column 5) and lagged log splines (column 6). Standard errors clustered by taxpayer are reported in parentheses. All specifications include regional and year fixed-effects as well as controls for age, age squared, gender and indicators for joint filing, children, ascendants and the type of taxpayer according to her main source of income (employee, self-employed, saver or taxpayers with other main source of income such as capital gains). Observations in all regressions are weighted by log base-year taxable income. Significance levels: *** = 1%, ** = 5%, and * = 10%.

Table A.4: ETI Estimates including Pensioners

	Gruber-Saez		Kleven-Schultz		Weber	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln(1 - \tau)$	0.429*** (0.013)	0.419*** (0.013)	0.586*** (0.017)	0.584*** (0.017)	0.625*** (0.033)	0.612*** (0.032)
$\Delta \ln(v)$			0.037*** (0.001)	0.038*** (0.001)		
Observations	4,516,638	4,516,638	3,980,947	3,980,947	3,404,067	3,404,067
Diff-in-Sargan p-value	0.00	0.00	0.00	0.00	0.78	0.79
Base-Year Splines	Cubic	Log	Cubic	Log	Lag Cubic	Lag Log
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: this table reports the elasticity of taxable income (ETI) for the period 1999-2014 considering pensioner taxpayers included in the sample. Columns 1-2 report the estimates of the ETI applying the Gruber-Saez estimation method under two alternatives: cubic splines (column 1) and log splines (column 2). Columns 3-4 report the estimates of the ETI using the method from Kleven and Schultz (2014) under two alternatives: cubic splines (column 3) and log splines (column 4). Columns 5-6 report the estimates of the ETI using the method from Weber (2014) under two alternatives: lagged cubic splines (column 5) and lagged log splines (column 6). Standard errors clustered by taxpayer are reported in parentheses. All specifications include regional and year fixed-effects as well as controls for age, age squared, gender and indicators for joint filing, children, ascendants and the type of taxpayer according to her main source of income (employee, self-employed, saver or taxpayers with other main source of income such as capital gains). Observations in all regressions are weighted by log base-year taxable income. Significance levels: *** = 1%, ** = 5%, and * = 10%.

Table A.5: ETI Estimates excluding Regional Movers

	Gruber-Saez		Kleven-Schultz		Weber	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta \ln(1 - \tau)$	0.353*** (0.014)	0.340*** (0.014)	0.547*** (0.018)	0.541*** (0.018)	0.634*** (0.036)	0.617*** (0.036)
$\Delta \ln(v)$			0.043*** (0.001)	0.043*** (0.001)		
Observations	3,956,894	3,956,894	3,490,996	3,490,996	2,946,864	2,946,864
Diff-in-Sargan p-value	0.00	0.00	0.00	0.00	0.28	0.27
Base-Year Splines	Cubic	Log	Cubic	Log	Lag Cubic	Lag Log
Weights	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: this table reports the elasticity of taxable income (ETI) for the period 1999-2014 excluding taxpayers that changed their regional fiscal residence in any year included in the sample period. Columns 1-2 report the estimates of the ETI applying the Gruber-Saez estimation method under two alternatives: cubic splines (column 1) and log splines (column 2). Columns 3-4 report the estimates of the ETI using the method from Kleven and Schultz (2014) under two alternatives: cubic splines (column 3) and log splines (column 4). Columns 5-6 report the estimates of the ETI using the method from Weber (2014) under two alternatives: lagged cubic splines (column 5) and lagged log splines (column 6). Standard errors clustered by taxpayer are reported in parentheses. All specifications include regional and year fixed-effects as well as controls for age, age squared, gender and indicators for joint filing, children, ascendants and the type of taxpayer according to her main source of income (employee, self-employed, saver or taxpayers with other main source of income such as capital gains). Observations in all regressions are weighted by log base-year taxable income. Significance levels: *** = 1%, ** = 5%, and * = 10%.