EU15

DV: log(CO2) with autoregressive lag without autoregressive lag Belgium Finland France Italy Italy United Kingdom United Kingdom False Positive Rate: 0.5% Austria Belgium Finland France Greece Greece Netherlands United Kingdom DV: log(CO2 p.c.) with autoregressive lag without autoregressive lag Finland Greece Greece Unit Italy Spain United Kingdom 2005 False Positive Rate: Finland Germany Greece Unit Italy Netherlands Spain United Kingdom DV: growth rate(CO2 p.c.) without autoregressive lag with autoregressive lag Belgium Belgium Finland Finland France France Germany Greece Unit Ireland Ireland Netherlands Spain Spain United Kingdom United Kingdom False Positive Rate: 0.5% Austria Belgium Belgium Denmark Finland Finland Germany Germany Greece Unit

Italy

Portugal

Sweden United Kingdom

DV: log(CO2) with autoregressive lag without autoregressive lag Time Time 1995 2000 2005 2010 2015 2000 2005 2010 Austria Austria Belgium Belgium Bulgaria Bulgaria Croatia Croatia Cyprus Cyprus Czech Republic Czech Republic ____ Denmark Denmark Estonia Estonia Finland France France Germany Germany Greece Greece Hungary Hungary Iceland Iceland Ireland Ireland Italy Italy Latvia Latvia Lithuania Lithuania Luxembourg Luxembourg Malta Malta Netherlands Netherlands ____ Norway Norway Poland Poland Portugal Portugal Romania Romania Slovak Republic Slovak Republic -------------Slovenia Slovenia _____ Spain Spain Sweden Sweden Switzerland Switzerland United Kingdom United Kingdom Time Time 1995 2000 2005 2010 2015 2005 2010 2000 2015 ____ Austria Belgium Austria Bulgaria Belgium Bulgaria Croatia Croatia Cyprus Czech Republic Cyprus False Positive Rate: 0.5% Czech Republic Denmark Denmark Estonia Estonia Finland Finland France France Germany Germany Greece Greece Hungary Hungary Iceland Iceland Ireland Unit Ireland Unit Italy Latvia Latvia Lithuania Lithuania Luxembourg Luxembourg Malta Malta Netherlands Netherlands Norway Poland Poland Portugal Portugal Romania Romania Slovak Republic Slovak Republic Slovenia Slovenia Spain Spain Sweden Sweden Switzerland Switzerland United Kingdom United Kingdom DV: log(CO2 p.c.) with autoregressive lag without autoregressive lag Time Time 1995 1995 2000 2005 2000 2005 2010 2015 2010 Austria Austria Belgium Belgium Bulgaria Bulgaria Croatia Croatia ---------**-**-------Cyprus Cyprus Czech Republic Czech Republic Denmark Estonia Estonia _____ _____ Finland Finland France Germany Germany Greece Hungary Hungary Iceland Iceland ------Ireland Ireland Unit _____ Italy Italy Latvia Latvia Lithuania Lithuania ____ Luxembourg ____ Luxembourg Malta Malta Netherlands Netherlands Norway Norway Poland Poland Portugal Portugal Romania Romania Slovak Republic Slovak Republic ___ Slovenia Slovenia Spain Spain Sweden Sweden Switzerland Switzerland United Kingdom United Kingdom Time Time 1995 2000 2005 2010 2015 1995 2000 2005 2010 2015 Austria Austria Belgium Belgium Bulgaria Bulgaria Croatia Croatia Cyprus Cyprus False Positive Rate: 0.5% Czech Republic Czech Republic Denmark Denmark Estonia Estonia Finland Finland France France Germany Germany Greece Hungary Hungary Iceland Iceland Ireland ____ -----Ireland _____ Italy Italy Latvia Latvia Lithuania Lithuania -----Luxembourg Luxembourg Malta ____ Malta Netherlands Netherlands Norway Poland Poland Portugal Portugal Romania Romania ____ Slovak Republic Slovak Republic Slovenia Spain Spain Sweden Sweden

Switzerland

United Kingdom

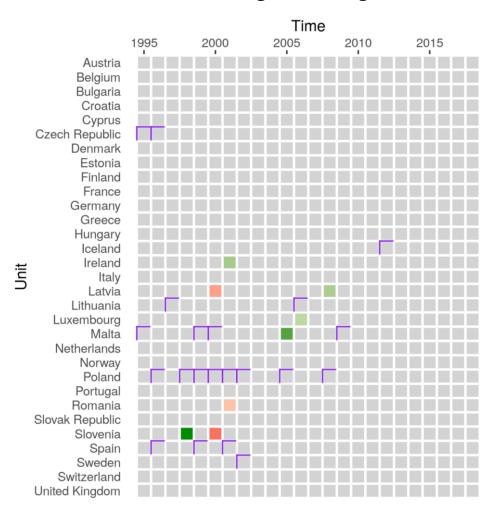
Switzerland

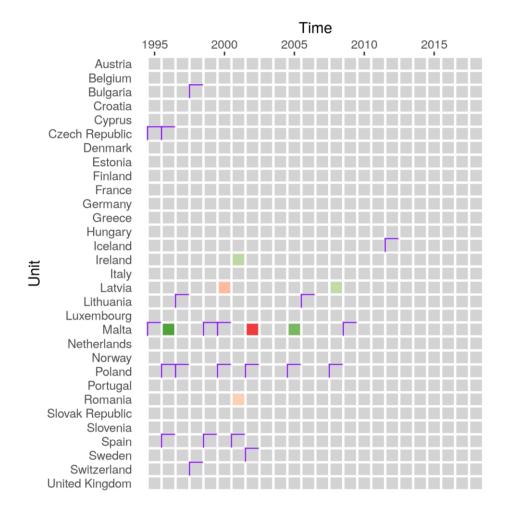
United Kingdom

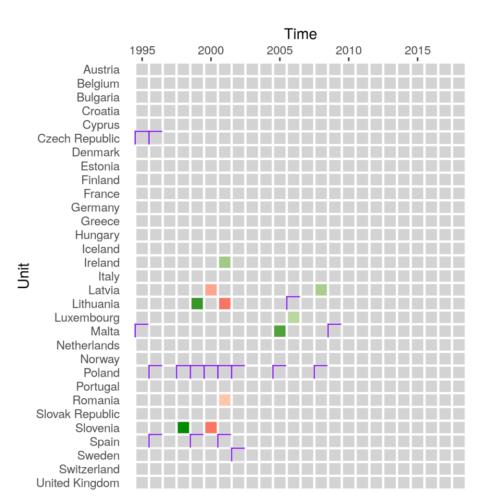
EU31

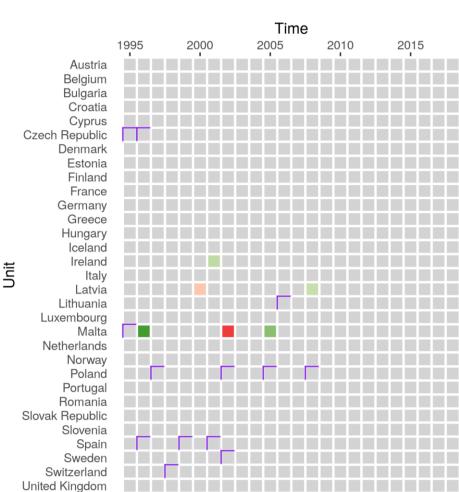
DV: growth rate(CO2 p.c.) with autoregressive lag

without autoregressive lag









Possible Treatments

- Only negative breaks
- only without AR lag
- Only EU15 countries

Country	Year	Sam ple	DV	Effect Size	Possible Treatment
Finland**	2000	EU15	level	-0.12	?2001: Change of basis for annual car ownership tax from total mass to CO2 emissions (ACEA 2016)?
					?1997: Significant increase in carbon tax?
Sweden**	2001	EU15	both	-0.10 (level) -0.07 (pc)	2001-2005: Carbon tax increase from US\$44 to US\$109 per ton of CO2 (roughly equivalent to 10ct/litre of petrol burned -> 25ct/litre) ⇔
					2001-2006: "Green Tax Shift" (2001-2006): overall raise of environmental taxes, income tax cuts, tax relief for biofuels
Germany**	2002/ 2003	EU15	both	-0.13	?1999-2003: Annual increase of mineral oil tax on fuel by 3.07ct/litre, respectively?
					?2004: Reduction of distance-based tax allowance for commuters from 36ct/km to 30ct/km (National Communication, p.87)?
					?2004: fuel and CO2 consumption labelling obligations for cars enter into force (ibid, p.88)?
UK**	2003	EU31	both	-0.15 (level) -0.11(pc)	2002: <u>Company Car Tax Reform</u> : now taxed on a percentage of their list price according to CO2 emission bands; " <u>following</u> a review of the existing regime [which] encouraged those using company cars to drive extra, unnecessary miles on business"
France*	2004	EU31	both	-0.11 (level) -0.09 (pc)	2002: Road safety measures (speed limit decrease, penalty increase, extension of controls) (National Communication, p.74)
Germany**	2005	EU31	level	-0.18	2005: <u>Einführung der LKW-Maut</u> auf Autobahnen und einigen Bundesstraßen
Sweden**	2006	EU31	level	-0.15	2001-2005: Carbon tax increase from US\$44 to US\$109 per ton of CO2 between (roughly equivalent to 10ct/litre of petrol burned -> 25ct/litre) ⇔ 2001-2006: "Green Tax Shift" (2001-2006): overall raise of environmental taxes, income tax cuts, tax relief for biofuels ?2007-2009: Green Car Subsidy of 1000€ (National Communication, p.48)?
Luxembourg**	2007	EU15	both	` '	2007: Vehicle Tax Reform based on CO2 emissions (National
				-0.138 (pc)	Communication, p. 163)?2007: subsidy of 750€ for purchase of energy efficient cars (ibid,
					p.164)? ?2007-2008: Raise in fuel tax by 2ct/litre (ibid, p.167)?
Ireland**	2009/ 2010	both	рс	-0.15	?2008: Change of basis for Vehicle Registration Tax and Motor Tax (annual) from engine size to CO2 emissions?
					2009: Introduction of Carbon Tax of 15€/tonne, increase of 20€ in 2011 (National Communication, p. 99)
					?2009: introduction of tax incentive of up to 1000€ for the purchase of bicycles for commuting (ibid, p.108)?
Sweden**	2010	EU31	рс	-0.16	2009: Exemption of "green cars" from annual road tax for five years, both private and business (ACEA 2016)
					?2011: "Inclusion of light commercial vehicles and light vehicles into system of CO2-differentiated vehicle tax"?
Netherlands**	2014	EU31	level	-0.14	???
Ireland	2015	both	level	-0.19 (EU15) -0.24 (EU31)	?2015: <u>Increse in Mineral Oil Tax</u>
Luxembourg	2015	EU31	рс	-0.4	???