Crisis and Reform of Road Transport Taxation

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A Panorama on Energy Taxes and Green Tax Reforms*

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Summary

WP FA04/2012

Climate Change, Buildings and Energy Prices

Alberto Gago, Michael Hanemann, Xavier Labandeira, Ana Ramos

Conventional approach

- Revenue Raising (Ramsey)
- Externality correction
  - Global and local environmental problems
  - Congestion
  - Accidents, etc.
- Energy dependence

<u>Taxes on registration, circulation, fuels + congestion charges</u>

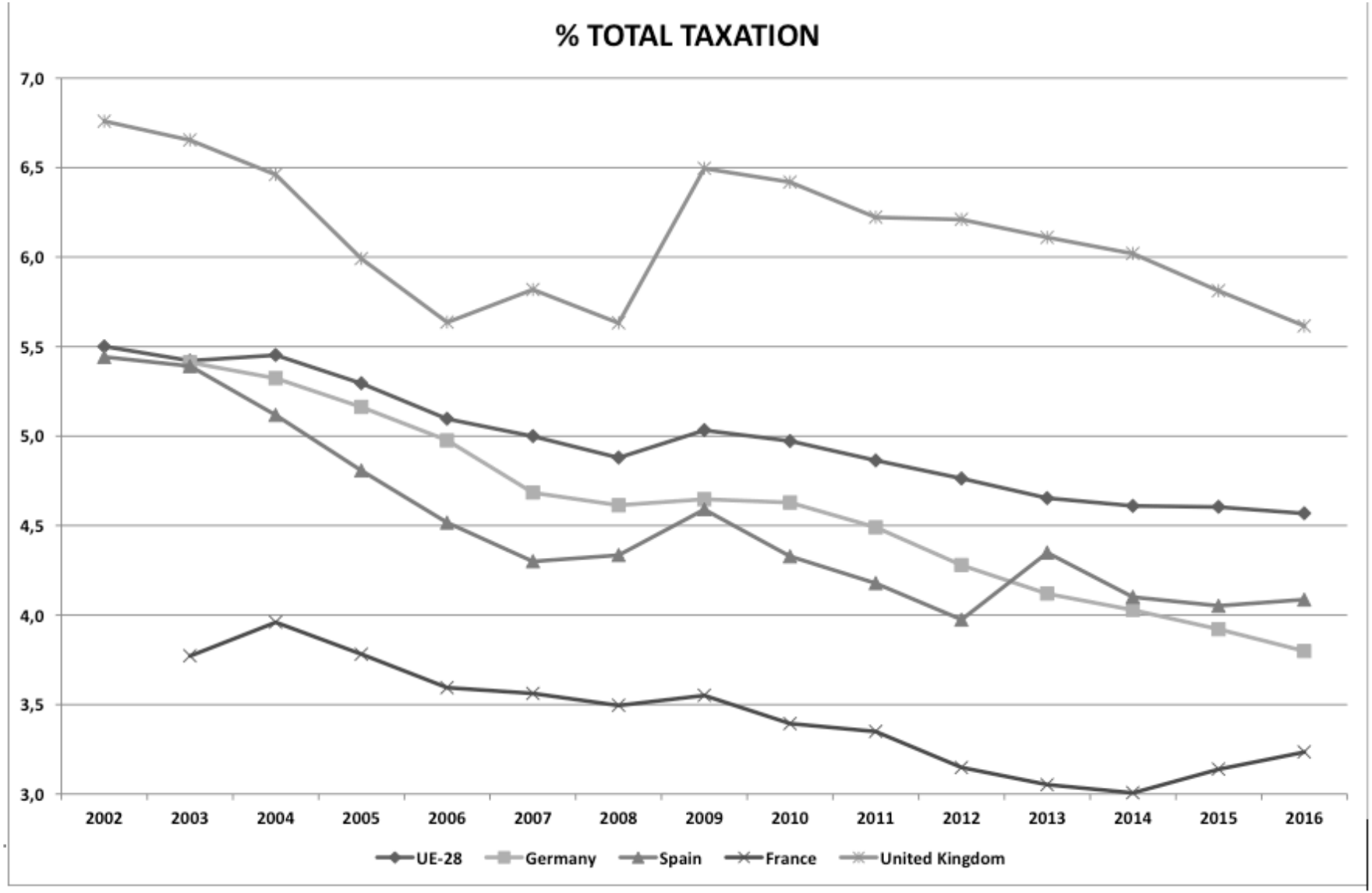
Externalities and tax correction

- How to combine different tax instruments?
- Which tax levels?
- New proposals on access and congestion
- Distributional effects
  - Are they relevant?
  - How to compensate them?
- Taxes in a wider context:
  - Subsidies
  - Standards: synergies?
  - Plate-access; bans

Changes in transport

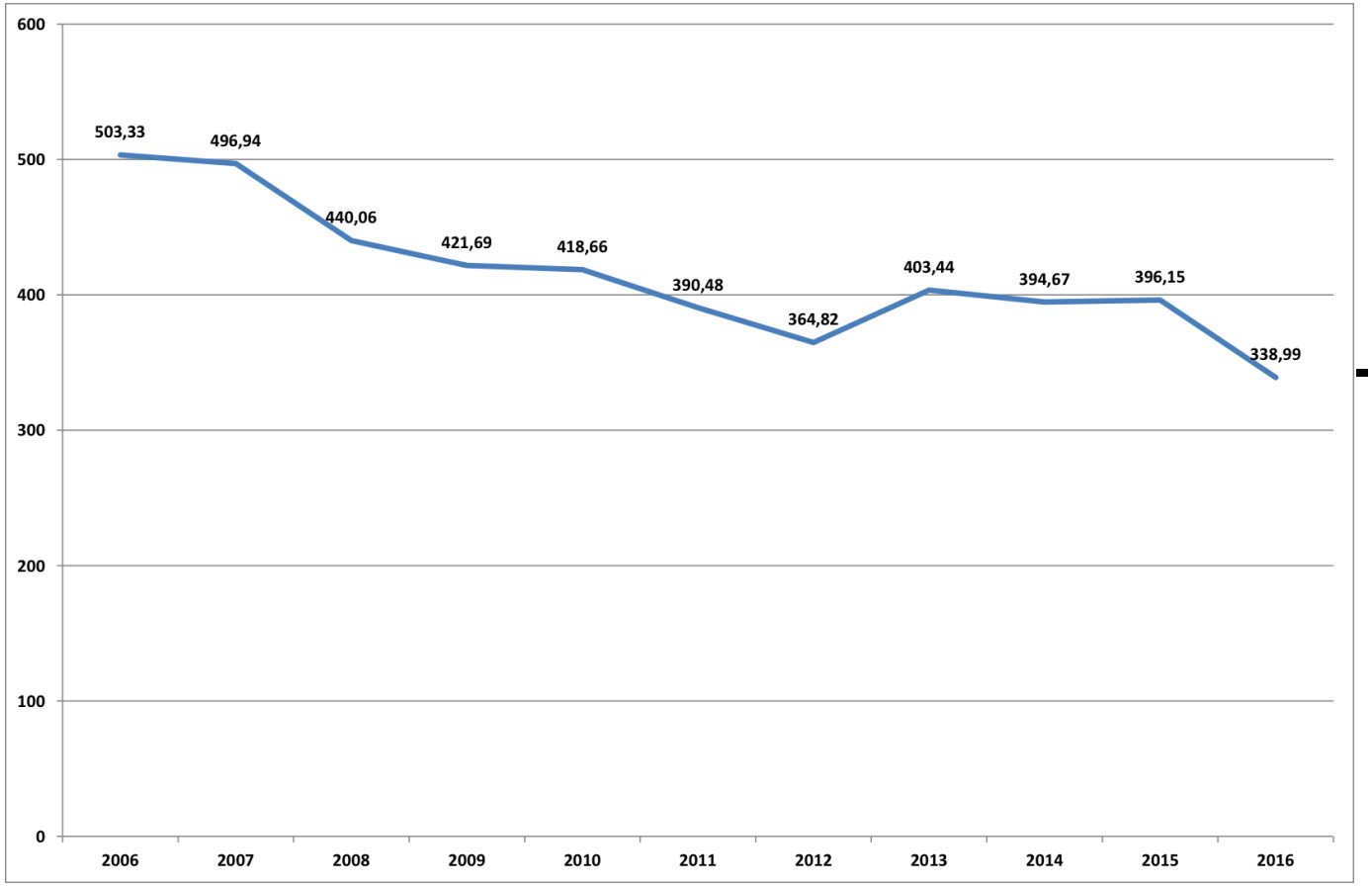
- Energy efficiency remarkable improvements (and potentials)
- Alternative technologies (EV, etc.)
- Less interest in property?
- Digitalization and new transport alternatives:
  - Car sharing
  - Self-driving cars

Crisis



European Commission, 2017

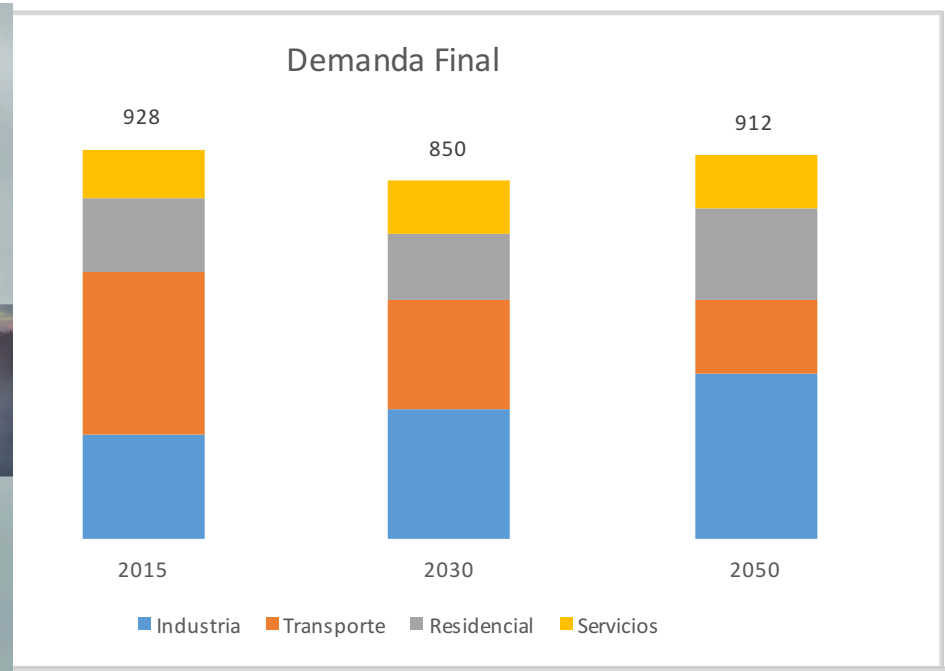
Tax revenue per car, Spain

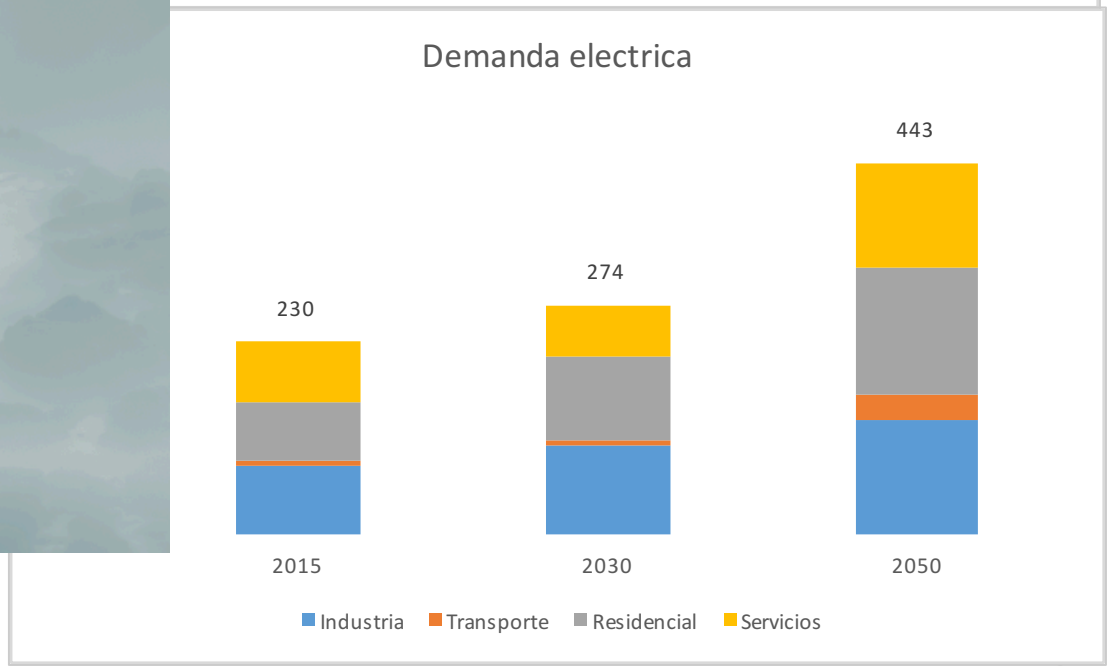


- 33%

Agencia Tributaria, 2018


Escenarios para el sector energético en España
2030 - 2050
[Informe]
economics for energy


Demanda Final
928
850
912
2015
2030
2050
Industria
Transporte
Residencial
Servicios


Demanda electrica
230
274
443
2015
2030
2050
Industria
Transporte
Residencial
Servicios

External costs of transport

Type		Paper	Year	Country	% GDP
Congestion		Delucchi (1997)	1991	U.S.	0.55-**2.36**
		Winston and Langer (2006)	1996	U.S.	0.32
		Van Essen et al. (2011)	2008	EU, Norway and Switzerland	1.10-1.80
		Cravioto et al. (2013)	2006	Mexico	1.04-1.05
		BITRE (2015)	2010	Australia	0.94
		BITRE (2015)	2015	Australia	1.13
		Schrank et al. (2015)	1982	U.S.	0.59
		Schrank et al. (2015)	2014	U.S.	0.92
		Keller (2018)	2015	Switzerland	**0.29**
Air Pollution	**Local**	DMT (2004)	2000	Denmark	**0.15**
		Fisher et al. (2007)	2001	New Zealand	0.24
		Van Essen et al. (2011)	2008	EU, Norway and Switzerland	0.39
		Cravioto et al. (2013)	2006	Mexico	0.61-0.62
		OECD (2014)	2010	OECD	**1.97**
		Guo et al. (2010)	2004	China	0.52
		Guo et al. (2010)	2008	China	0.58
	Global	DMT (2004)	2000	Denmark	**0.11**
		Van Essen et al. (2011)	2008	EU, Norway and Switzerland	0.97
		Cravioto et al. (2013)	2006	Mexico	0.99-**1.00**
		Ivkovic et al. (2018)	2013	Serbia	0.20
	Total	GEA (2018)	2008	Germany	**1.93**
		GEA (2018)	2014	Germany	**1.78**
Accidents		López et al. (2004)	1997	Spain	1.35
		DMT (2004)	2000	Denmark	**0.49**
		Van Essen et al. (2011)	2008	EU, Norway and Switzerland	**1.75**
		Cravioto et al. (2013)	2006	Mexico	1.32-1.34
Noise		DMT (2004)	2000	Denmark	**0.65**
		Van Essen et al. (2011)	2008	EU, Norway and Switzerland	**0.13**
		Cravioto et al. (2013)	2006	Mexico	0.42-0.43

How to proceed?

- (1) Giving up
- (2) Trying to fix the current system
  - Adjusting fuel taxes to all pollutants
  - Salience through registration tax? Feebates?
  - Extending congestion charges
- Still, not an easy task: Spain these days…
  - Low tax levels but…
  - Diesel taxes seen as unfair, sometimes affecting ‘clean’ cars
  - Huge exemptions advanced
  - Revenue effects?

Meta-analyses of price elasticities of car fuels

Study	Product	Elasticity
Espey (1996)	Gasoline	-0.65 (LT)
Espey (1998)	Gasoline	-0.16 (ST) -0.81 (LT)
Hanly et al. (2002)	Car fuels	-0.76 (ST) -1.16 (LT)
Graham y Glaiter (2002)	Car fuels	-0.25 (ST) -0.77 (LT)
Brons et al. (2008)	Gasoline	-0.36 (ST) -0.81 (LT)
Havranek et al. (2012)	Gasoline	-0.09 (ST) -0.31 (LT)
Labandeira et al. (2017)	Gasoline	-0.15 (ST) -0.77 (LT)
	Diesel	-0.29 (ST) -0.44 (LT)

WP 02/2018

Deep reforms in electricity pricing: evidence from a quasi experiment

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Transport and low-carbon fuel: A study of public preferences in Spain

Maria L. Loureiro [a], Xavier Labandeira [b, c], Michael Hanemann [d]

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https://doi.org/10.1016/j.eneco.2013.09.010

Highlights

- Road transport is the cause of important energy-related problems, particularly the emission of greenhouse gases and local pollution.
- This paper explores public attitudes and preferences towards low-carbon fuel policies in Spain via contingent valuation.
- A factor analysis is performed, showing the existence of pro-social and economic factors related to preferences for policies.
- Drivers were willing to pay an extra of 115.5 Euros per year for low-carbon fuels, roughly an extra 0.07 (0.08) Euros/liter for gasoline (diesel).
- The results encourage the use of these low-GHG policies as feasible alternatives for climate policies in the transport area.

How to proceed?

- (3) A new system for taxing road transport
  - Heavily based on vehicle characteristics
  - Able to discriminate in time and location
  - Able to act as a km tax
  - Able to keep revenues
- Not writing on a blank sheet:
  - Singapore (1975): Technical feasibility
  - Stockholm (2006): How to get public support
  - Oregon (2015): The importance of testing and transition

Marginal external costs of vehicle use

Externality	Fuel	Type of road	MEC (€ct/vkm)
Congestion	All	Motorway (metropolitan)	26.8-61.5
		Main (metropolitan)	141.3-181.3
		Other (metropolitan)	159.3-242.6
		Main (urban)	48.7-75.8
		Other (urban)	139.4-230.5
		Motorway (rural)	13.4-30.8
		Main (rural)	18.3-60.7
		Other (rural)	42.0-139.2
Local pollution	Diesel	Urban	0.7-10.3
		Sub-urban	0.3-3.4
		Rural	0.2-1.2
		Motorway	0.2-1.3
	Gasoline	Urban	0.4-3.8
		Sub-urban	0.1-3.5
		Rural	0.1-2.8
		Motorway	0.1-3.5
	Electricity	Urban	0.72
		Rural	0.99
Global pollution	Diesel	Urban	1.6-3.0
		Rural	1.1-2.3
		Motorway	1.2-2.7
	Gasoline	Urban	2.4-3.9
		Rural	1.4-2.3
		Motorway	1.5-2.3
	Electricity	Average	1.7
Accidents	All	Motorway	0.1
		Uban	0.3
		Other	0.2
Noise	Conventional	Urban (day)	0.88-2.14
		Urban (night)	1.61-3.89
		Rural (day)	0.01-0.02
		Rural (night)	0.01-0.04
	Electricity	Urban (day)	0.88-2.14
		Urban (night)	0.80-1.95
		Rural (day)	0.01-0.02
		Rural (night)	0.01-0.03

Korzhenevych et al., 2014; Jochem et al., 2016

Comprehensive and Automated Vehicle Tax (CAVT)

	Zone 1 (urban)	Zone 2 (semi-urban)	Zone 3 (non-urban)
Vehicle type A	*Peak* Access charge 1 Time charge 1a (...) km charge	*Peak* Time charge 2a (...) km charge	km charge
	Non-peak km charge	*Non-peak* km charge	
Vehicle type B	(...)	(...)	(...)

Vehicle type A	Payment					
		Congestion	Local P/ noise	Global P	Accidents	Infrastructures
Access charge	Euros	X	-	-	-	-
Time charge 1a	Euros/hour	X	X	-	-	-
km tax	Euros/km	-	X	X	X	X

Some comments

- Benefits
  - Better internalization, also applicable to old vehicles
  - Revenue potentials (different government levels)
  - From energy to vehicle-customized taxation (electricity)
- Sub-optimal (feasibility)
  - How to aggregate vehicle types?
  - How to approximate external costs?
  - Rebound effects?
- Interesting to combine with purchase taxation (VAT + registration)
  - Salience
  - ‘Ability to pay’

Some comments

- Transition
  - 1st phase: Conventional tax reform + pilot experiences
  - 2nd phase: General application and tax substitution. Compensations
- Viable?
  - Privacy
  - Distributional impacts? Able to define precise compensations
  - International issues
  - Only for developed countries?
- Need of a comprehensive assessment and experimental approaches:

FOSTERING ENERGY EFFICIENCY IN THE RETAIL SECTOR: A FIELD EXPERIMENT

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THANKS

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