

Online Appendix

to

DOES RICARDIAN EQUIVALENCE HOLD? THE RELATIONSHIP BETWEEN PUBLIC AND PRIVATE SAVING IN SPAIN

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We tested the Ricardian hypothesis using both total (cpr) and non-durable (cpr^{nodur}) private consumption as dependent variables. The estimates for non-durable private consumption are presented in the main text, while the results regarding total private consumption are presented here.

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Table A1. Buiter-Tobin test with total private consumption (*cpr*): Two-step ECM estimation

	Sample 1980Q1-2011Q4		Sample 1980Q1-2007Q4	
Cointegration equation				
<i>y</i>	0.83*** (0.01)	0.78*** (0.02)	0.84*** (0.02)	0.80*** (0.01)
<i>gb</i>	0.11*** (0.04)	-0.11 (0.08)	0.17** (0.08)	0.04 (0.07)
<i>ntr</i>	0.14*** (0.04)	-0.20* (0.12)	0.16*** (0.06)	-0.20*** (0.07)
<i>wh₋₁</i>		-0.002*** (0.001)		-0.002*** (0.0003)
Short-term dynamics				
<i>ECM₋₁</i>	-0.09*** (0.03)	-0.05 (0.03)	-0.16*** (0.05)	-0.14** (0.06)
Δcpr_{-1}	0.17* (0.08)	-0.07 (0.09)	0.27*** (0.09)	0.17* (0.10)
Δy	0.30** (0.05)	0.22*** (0.05)	0.26*** (0.06)	0.21*** (0.06)
Δgb	0.17*** (0.06)	0.13** (0.06)	0.06 (0.05)	0.04 (0.05)
Δntr	0.01 (0.06)	0.01 (0.05)	-0.01 (0.05)	-0.02 (0.05)
Δwh_{-1}		0.004*** (0.001)		0.003*** (0.001)
<i>Constant</i>	239.05*** (64.67)	270.05*** (60.92)	253.63*** (68.93)	210.26** (69.05)
R^2	0.42	0.50	0.36	0.40
N° obs.	126	126	110	110
Wald tests				
<i>y = ntr; gb=0</i> (Keynesian)	1318.17***	752.18***	49.99***	891.96***
<i>y = gb = ntr</i> (Ricardian)	682.30***	271.46***	53.16***	344.44***
Chow test: break in 2008Q1	6.65***	9.33***		

Notes: Standard errors in parentheses. The symbols *, ** and *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.

Table A2. Kormendi test with total private consumption (*cpr*)

	Sample 1980Q1-2011Q4		Sample 1980Q1-2007Q4	
	Levels	First differences	Levels	First differences
y^{tot}	0.36*** (0.04)	0.20*** (0.05)	0.48*** (0.04)	0.15*** (0.06)
y^{tot}_{-1}	0.11** (0.05)	0.08** (0.04)	0.15*** (0.04)	0.10*** (0.04)
g	-0.24*** (0.07)	-0.20*** (0.06)	-0.21*** (0.08)	-0.10 (0.06)
w_{-1}	0.002*** (0.001)	0.002*** (0.001)	0.001 (0.001)	0.002** (0.001)
tr	0.24** (0.11)	-0.02 (0.06)	-0.04 (0.09)	-0.04 (0.05)
t	0.23*** (0.05)	0.22*** (0.04)	0.16** (0.06)	0.09* (0.05)
re	-0.20*** (0.07)	0.09 (0.07)	-0.42*** (0.07)	0.08 (0.08)
$gint$	-0.31*** (0.10)	0.11 (0.23)	-0.09 (0.13)	-0.16 (0.22)
pd_{-1}	0.02*** (0.004)	-0.03 (0.02)	0.01 (0.004)	-0.01 (0.02)
$pd_{-1} * \Delta pdratio_{-1}$	-0.001*** (0.0002)	0.0001 (0.0003)	-0.001*** (0.0002)	-0.0002 (0.0004)
<i>Constant</i>	14357.76*** (1852.86)	243.24*** (71.30)	9084.97***	290.64*** (89.83)
R^2	0.999	0.609	0.999	0.509
N° obs.	123	123	107	107
Wald tests:				
$y=tr=-t=-re=gint;$ $g=0$ (Keynesian)	158.70***	48.42***	145.98***	25.16***
$t=re=gint=pd=0$ (Ricardian)	111.50***	35.23***	122.18***	7.72
Chow test: break in 2008Q1	5.69***	2.75***		

Notes: Standard errors in parentheses. The symbols *, ** and *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively. The structural break Chow test follow a F(11,101) distribution.

Table A3. Blanchard-based tests with total private consumption (*cpr*) — constant interest rates

	Model (4)		Model (5)		Model (6)	
	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4
<i>cpr</i> _{<i>t</i>-1}	1.16*** (0.08)	1.09*** (0.10)	0.96*** (0.04)	0.94*** (0.05)	1.01*** 0	1.00*** 0
<i>cpr</i> _{<i>t</i>-2}	-0.18* (0.09)	-0.15 (0.10)				
<i>y</i> _{<i>t</i>}	0.20*** (0.05)	0.23*** (0.05)	0.24** (0.05)	0.20** (0.05)	0.24** (0.05)	0.17** (0.05)
<i>y</i> _{<i>t</i>-1}	-0.01 (0.07)	-0.01 (0.06)	-0.20** (0.06)	-0.15** (0.05)	-0.24 (-)	-0.17 (-)
<i>y</i> _{<i>t</i>-2}	-0.18** (0.05)	-0.17** (0.05)				
<i>a</i> _{<i>t</i>-1}					-0.00* (0.00)	0.00 (0.00)
<i>a</i> _{<i>t</i>-2}			0.00 (0.00)	0.00 (0.00)		
LR tests						
$\mu = 0$ (χ^2_2)	22.01***	17.84***	8.77**	1.49	6.62**	1.54
$\lambda = 0$ (χ^2_2)	28.29***	21.25***	19.30***	12.69***	20.83***	12.96***
$\mu=\lambda=0$ (χ^2_3)	28.44***	22.07***	35.32***	12.85***	33.28***	13.02***
Chow test: 2008Q1	6.20***		7.00***		7.20***	

Notes: Standard errors in parentheses. The symbols *, ** and *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively. The structural break Chow test follow a F(16,104) distribution.

Table A4. Blanchard-based tests with total private consumption (*cpr*) — time-varying interest rates

	Model (4)		Model (5)		Model (6)	
	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4	Sample 1980Q1- 2011Q4	Sample 1980Q1- 2007Q4
<i>cpr</i> _{<i>t</i>-1}	0.93*** (0.10)	0.74*** (0.10)	0.96*** (0.05)	0.84*** (0.07)	0.98*** (0.01)	0.98*** (0.01)
<i>cpr</i> _{<i>t</i>-2}	-0.10 (0.10)	-0.10 (0.10)				
<i>y</i> _{<i>t</i>}	0.54*** (0.05)	0.57*** (0.04)	0.52*** (0.05)	0.52*** (0.05)	0.51*** (0.05)	0.47*** (0.04)
<i>y</i> _{<i>t</i>-1}	-0.45** (0.07)	-0.31** (0.07)	-0.49*** (0.05)	-0.40*** (0.05)	-0.51 (-)	-0.47 (-)
<i>y</i> _{<i>t</i>-2}	-0.03 (0.07)	-0.12 (0.07)				
<i>a</i> _{<i>t</i>-1}					0.00* (0.00)	0.00** (0.00)
<i>a</i> _{<i>t</i>-2}			0.00 (0.00)	0.00 (0.00)		
LR tests						
$\mu=0$ (χ^2_2)	3.84	26.36***	2.95	33.51***	3.42	34.22***
$\lambda=0$ (χ^2_2)	89.26***	109.05***	87.02***	82.23***	86.84***	82.90***
$\mu=\lambda=0$ (χ^2_3)	89.98***	110.23***	91.28***	107.74***	92.32***	109.18***
Chow test: 2008Q1	5.81***		5.89***		5.93***	

Notes: Standard errors in parentheses. The symbols *, ** and *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively. The structural break Chow test follow a F(16,104) distribution.

Table A5. Aschauer test with total private consumption (*cpr*)

	<i>cpr</i> _{<i>t</i>-1}	<i>g</i> _{<i>t</i>-1}	<i>g</i> _{<i>t</i>-2}	<i>dp</i> _{<i>t</i>-1}	<i>dp</i> _{<i>t</i>-2}	δ/γ
Sample 1980Q1-2011Q4						
Unrestricted model						
<i>cpr</i> _{<i>t</i>}	1.01*** (0.02)	0.01 (0.13)	0.03 (0.13)	0.01 (0.04)	-0.01 (0.04)	0.00 (0.02)
<i>g</i> _{<i>t</i>}		1.01*** (0.09)	-0.01 (0.10)	-0.02 (0.02)	0.05** (0.02)	0.01** (0.00)
Restricted model						
<i>cpr</i> _{<i>t</i>}	1.00*** (0.00)	0.06 (-)	-0.06 (-)	0.00 (0.10)	0.02 (-)	0.01 (-)
<i>g</i> _{<i>t</i>}		1.08*** (0.08)	-0.09 (0.08)	0.00 (0.02)	0.01 (0.02)	0.03 (0.02)
LR test of restrictions:	$\chi^2_4 = 8.95^*$					
Sample 1980Q1-2007Q4						
Unrestricted model						
<i>cpr</i> _{<i>t</i>}	1.01*** (0.02)	0.01 (0.13)	-0.01 (0.13)	-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.02)
<i>g</i> _{<i>t</i>}		0.93*** (0.10)	0.06 (0.10)	0.03 (0.02)	0.01 (0.02)	0.01** (0.00)
Restricted model						
<i>cpr</i> _{<i>t</i>}	1.01*** (0.00)	0.04 (-)	-0.03 (-)	-0.01 (0.10)	-0.01 (-)	-0.02 (-)
<i>g</i> _{<i>t</i>}		0.91*** (0.08)	0.08 (0.08)	0.03 (0.02)	0.01 (0.02)	0.01** (0.00)
LR test of restrictions:	$\chi^2_4 = 1.69$					

Notes: Standard errors in parentheses. The symbols *, ** and *** denote rejection of the null hypothesis at the 10%, 5% and 1% significance levels, respectively.