Seminar GPEARI/GEE

Fiscal Episodes in the EMU: Elasticities and Non-Keynesian Effects

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Portuguese Episode
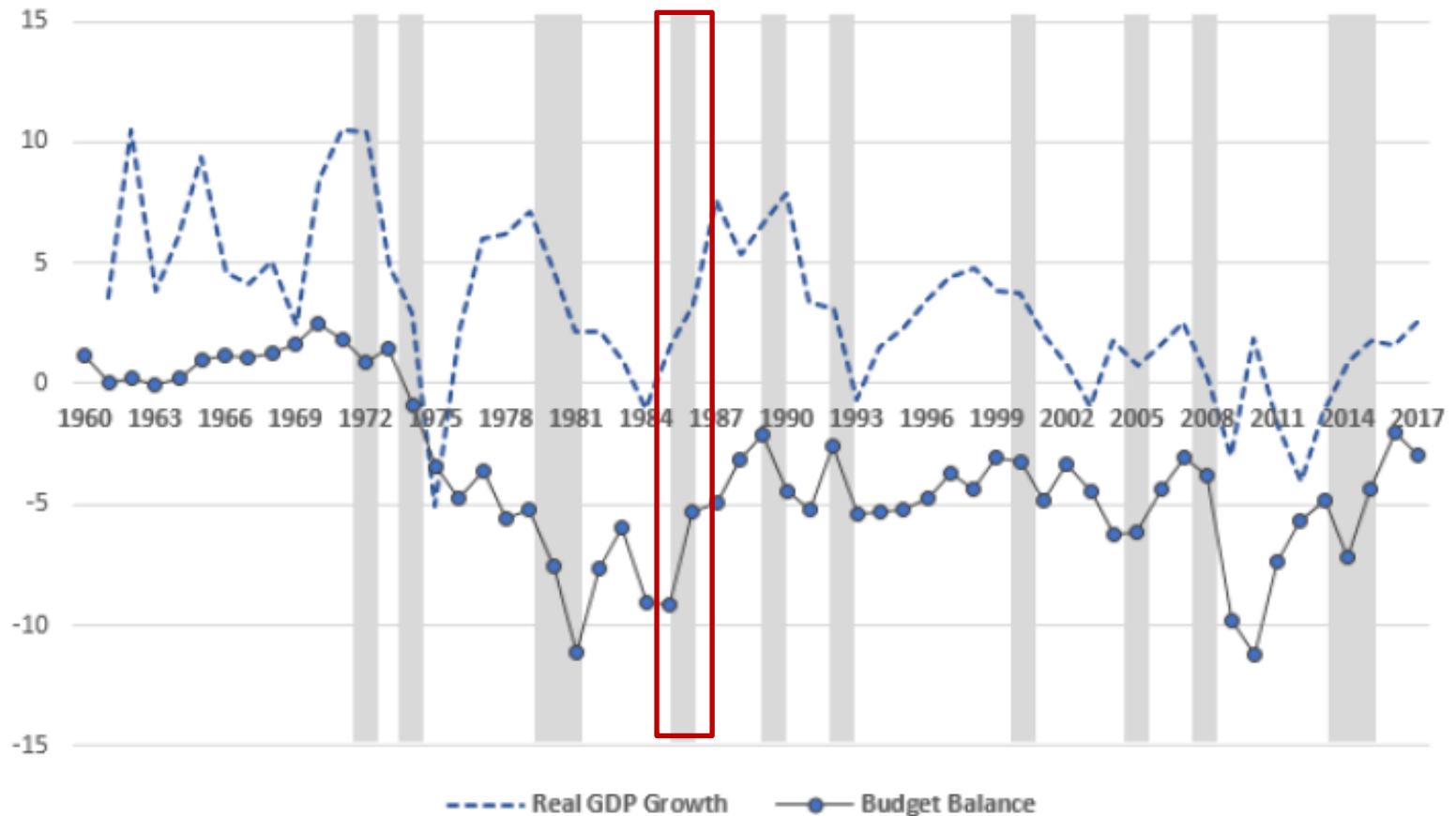
Portuguese Episode

Fiscal Episodes and non-keynesian effects in Portugal (1965-2017)

1965-1982	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Fiscal Episodes							E	E		E					E	E	E	C
CAPB	2.0	2.2	2.2	2.2	2.9	3.3	1.8	0.0	0.6	-1.3	-1.3	-1.6	-0.6	-2.5	-2.8	-5.6	-7.2	-3.0
ΔCAPB	:	0.2	0.0	0.0	0.7	0.3	-1.5	-1.7	0.6	-1.9	0.0	-0.3	1.0	-1.9	-0.4	-2.7	-1.6	4.2
Real GDP Growth	9.4	4.6	4.2	5.1	2.4	8.5	10.5	10.4	4.9	2.9	-5.1	2.3	6.0	6.2	7.1	4.8	2.2	2.2
NK Episodes								RE		RE						RE	RE	

1983-2000	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fiscal Episodes	C			C				E		C	E					E		
CAPB	-0.3	-1.6	-0.6	3.2	2.5	3.4	3.2	1.4	0.5	2.7	0.1	0.5	0.7	0.2	-0.2	-2.0	-1.0	-1.3
ΔCAPB	2.8	-1.3	1.0	3.9	-0.7	0.9	-0.2	-1.7	-1.0	2.2	-2.6	0.4	0.2	-0.5	-0.4	-1.8	1.0	-0.3
Real GDP Growth	1.0	-1.0	1.6	3.3	7.6	5.3	6.6	7.9	3.4	3.1	-0.7	1.5	2.3	3.5	4.4	4.8	3.9	3.8
NK Episodes				EC				RE			RE							

2001-2017	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Fiscal Episodes	E	C		E		C			E	E	C	C		E	C	C	E
CAPB	-2.9	-0.9	-1.0	-3.2	-3.1	-1.4	-0.7	-1.1	-5.9	-8.3	-2.5	1.2	2.1	-0.7	1.0	2.7	0.8
ΔCAPB	-1.5	1.9	-0.1	-2.2	0.1	1.7	0.6	-0.4	-4.7	-2.4	5.8	3.6	0.9	-2.8	1.7	1.7	-1.9
Real GDP Growth	1.9	0.8	-0.9	1.8	0.8	1.6	2.5	0.2	-3.0	1.9	-1.8	-4.0	-1.1	0.9	1.8	1.9	2.8
NK Episodes	RE					EC			RE						EC	EC	

Source: Authors' calculations.
Note: E – Fiscal Expansions; C – Consolidations; RE – Recessive Expansions; EC – Expansionary Consolidations NKE are episodes where: i) the average real GDP growth during the two years after the fiscal contraction is greater than the growth during the two years before, and; ii) the real GDP growth during the two years after the expansions is smaller than the average growth during the two years before.

Some Literature Contributions

Giavazzi and Pagano (1996):

- Facing fiscal episodes, taxes and government consumption have positive and negative impacts on output, respectively;
- Transfers revealed to be expansionary during "normal times".

Miller and Russek (1996):

- Found evidences of non-Keynesian effects;
- Unusual fiscal contractions uses to amplify the positive and negative effects of government spending and revenue on real private consumption.

Van Aarle and Garretsen (2001):

- The evidence of non-Keynesian effects is limited during the transition period to the EMU;
- There is no evidence of non-linearities in both taxation and transfers;
- Government consumption has a positive influence on private spending;
- The effects of fiscal adjustments on private spending, appear to have been relatively small.

Some Literature Contributions

Afonso (2010):

- The long-run elasticity of private consumption with respect to general government final consumption is negative;

- A tax raise, during a fiscal consolidation, can have a positive long-run effect on private consumption;

- The long-run elasticity of social transfers is statistically significant and negative.

Afonso and Martins (2016):

- Consumers are not behaving in a Ricardian way;

- There is evidences of non-Keynesian effects in the absence of fiscal consolidations (tax-based).

Identifying Fiscal Episodes

CAPB-based Approach

We considered the definition made by Alesina and Ardagna (2010), where a fiscal episode, expansion or contraction, occurs when there is a change of at least 1.5 p.p. in the cyclically-adjusted primary balance.

$$FE^E = \begin{cases} 1; & \Delta CAPB \leq -1.5 \\ 0; & \Delta CAPB > -1.5 \end{cases} \quad ; \quad FE^C = \begin{cases} 1; & \Delta CAPB \geq 1.5 \\ 0; & \Delta CAPB < 1.5 \end{cases}$$

The sample is composed by 19 Euro Area Member States for the period of 1960-2017 (data sourced from the AMECO database).

Identifying Fiscal Episodes

	Fiscal Episodes		
Country	**Expansions** $\Delta CAPB<-1.5$	**Consolidations** $\Delta CAPB>1.5$	**Time-series**
Belgium	1972, 1976, 1980, 2003, 2005, 2009	1982, 1984, 2006	1966-2017
Germany	1995, 2001, 2010	1996, 2000, 2011	1991-2017
Estonia	1996, 1998, 2005, 2007-2008, 2011-2012	2009	1996-2017
Ireland	1974-1975, 1978, 1990, 2001, 2007-2010	1976, 1982-1983, 1988, 2000, 2003, 2011-2013	1970-2017
Greece	1975, 1981, 1985, 1988-1989, 2001, 2003-2004, 2006, 2008-2009, 2013, 2015	1982, 1986-1987, 1991, 1994, 1996, 2005, 2010-2011, 2014, 2016	1966-2017
Spain	2008-2009	1986, 1992, 1996, 2010, 2013	1971-2017
France	2009	1996	1971-2017
Italy	1972, 1981, 2000	1976, 1982, 1991-1993, 1997, 2007, 2012	1971-2017
Cyprus	2002, 2008-2009, 2014	2007, 2012-2013, 2015	1999-2017
Latvia	1998-1999, 2006	2009, 2011-2012	1998-2017
Lithuania	2007, 2011	1998-1999, 2010, 2012	1998-2017
Luxembourg	1979, 1986, 2002	1982-1983, 1985, 2005	1971-1987, 1996-2017
Malta	1996, 1998, 2003, 2008	1999, 2004, 2009, 2016-2017	1996-2017
Netherlands	1986, 2001, 2009	1977, 1991, 1993, 1996, 2013, 2016	1970-2017
Austria	1967, 1975, 2004	1984, 1997, 2001, 2005, 2015	1966-2017
Portugal	1971, 1972, 1974, 1978, 1980-1981, 1990, 1993, 1998, 2001, 2004, 2009-2010, 2014, 2017	1982-1983, 1986, 1992, 2002, 2006, 2011-2012, 2015-2016	1966-2017
Slovenia	2013	2012, 2014, 2015	1999-2017
Slovakia	2000, 2002, 2005-2006, 2009	1998, 2001, 2003, 2011, 2013	1998-2017
Finland	1978-1979, 1982, 1987, 1991, 2001, 2009-2010	1967, 1976, 1981, 1984, 1988, 1996, 1998, 2000	1966-2017
Total	81	98	

Source: Authors' calculations.

Non-Keynesian Episodes

Non-Keynesian episodes, are fiscal episodes where:

A. **Expansionist Consolidations**: the average real GDP growth during the two years after the consolidation is greater than the growth during the previous two years, and;

B. **Recessive Expansions**: the average real GDP growth during the two years after the expansion is smaller than the average growth during the previous two years.

Non-Keynesian Episodes

Non-keynesian episodes, by date

Non-keynesian episodes		
Country	**Recessive expansions**	**Expansionary consolidations**
Belgium	1980, 2009	1984, 2006
Germany	2001	2000, 2011
Estonia	1998, 2007, 2008, 2012	
Ireland	1974-1975, 1990, 2001, 2007-2009	1988, 2011, 2013
Greece	1981, 2004, 2008-2009	1994, 2014, 2016
Spain	2008-2009	1986, 1996, 2010, 2013
France	2009	
Italy	1981	1976
Cyprus	2002, 2008-2009	2007, 2015
Latvia	1998-1999	2011, 2012
Lithuania	2007	2010
Luxembourg	1979, 2002	1982-1983, 1985, 2005
Malta	1996, 1998, 2003, 2008	1999
Netherlands	1986, 2001, 2009	1977, 1993, 1996, 2013, 2016
Austria	1967, 1975	1997, 2005, 2015
Portugal	1972, 1974, 1980-1981, 1990, 1993, 2001, 2009	1986, 2006, 2015-2016
Slovenia		2014-2015
Slovakia	2009	2001, 2003, 2011
Finland	1982, 1991, 2001, 2009	1984, 1988, 1996
Total	52	45

Source: Authors' calculations.

Identifying Fiscal Episodes

Narrative Approach

The IMF proposed an alternative approach to determine fiscal episodes. Devries et al. (2011) and Gupta et al. (2017) presented a dataset of fiscal consolidations based on policy documents, central banks reports, Stability and Convergence Programs submitted to the European Commission, and IMF and OECD reports.

It should be noted that the sample only has 10 countries during the period of 1978-2015.

Identifying Fiscal Episodes

Comparison of Approaches

Fiscal Consolidations			
Country	**CAPB Approach**	**Narrative Approach**	**Common Episodes**
Belgium	1982, 1984, 2006	1982-1985, 1987, 1990, 1992-1994, 1996-1997, 2010-2015	1982
Germany	1996, 2000, 2011	1982-1984, 1991-1995, 1997-2000, 2003-2004, 2006-2007, 2011-2012	2000, 2011
Ireland	1982-1983, 1988, 2000, 2003, 2011-2013	1982-1988, 2009-2015	1982, 1983, 1988, 2013-2015
Spain	1986, 1992, 1996, 2010, 2012	1983-1984, 1989-1990, 1992-1997, 2009-2015	1992, 1996, 2010, 2012
France	1996	1979, 1987, 1989, 1991-1992, 1995-1997, 1999-2000, 2011-2015	1996
Italy	1982, 1991-1993, 1997, 2007, 2012	1991-1998, 2004-2007, 2010-2015	1991-1993, 1997, 2007, 2012
Netherlands	1991, 1993, 1996, 2013	1981-1988, 1991-1993, 2004-2005, 2011-2013, 2015	1991, 1993, 2013
Austria	1984, 1997, 2001, 2005, 2015	1980-1981, 1984, 1996-1997, 2001-2002, 2011-2012, 2015	1984, 1997, 2001, 2015
Portugal	1982-1983, 1986, 1992, 2002, 2006, 2011-2012, 2015	1983, 2000, 2002-2003, 2005-2007, 2010-2015	1983, 2002, 2006, 2011-2012, 2015
Finland	1981, 1984, 1988, 1996, 1998, 2000	1992-1997, 2011	1997
Total	51	131	34

Source: Authors' calculations, and Devries et al. (2011) and Gupta et al. (2017).

Empirical Assessment

- **Question:**

  i) How the fiscal elasticities vary during fiscal consolidations (in comparison to the remaining period, and ii) what are the possible sources of non-keynesian responses (NKE)

- **Method:**

  -Sample: 19 Member States in 1960-2017 (natural logarithm of real per capita values)

  -Country Fixed Effects model with dummies to identify fiscal episodes

  -Estimate short and long-run elasticities of private consumption to fiscal instruments

  -Wald Tests to compare the results during consolidations and in "normal times"

- **Baseline Specification:**

$$\Delta Priv\_C_{it} = c_i + \lambda_1 Priv\_c_{it-1} + \lambda_2 \Delta Y_{it} + \lambda_3 Y_{t-1} + FE^C \text{ X } (\beta_1 \Delta Tax_{it} + \beta_2 Tax_{it-1} + \beta_3 \Delta ORev_{it} +$$

$$\beta_4 ORev_{it-1} + \beta_5 \Delta CE_{it} + \beta_6 CE_{it-1} + \beta_7 \Delta GFKF_{it} + \beta_8 GFKF_{it-1} + \beta_9 \Delta Social_{it} + \beta_{10} Social_{it-1} +$$

$$\beta_{11} \Delta OExp_{it} + \beta_{12} OExp_{it-1}) + (1 - FE^C) \text{ X } (\alpha_1 \Delta Tax_{it} + \alpha_2 Tax_{it-1} + \alpha_3 \Delta ORev_{it} +$$

$$\alpha_4 ORev_{it-1} + \alpha_5 \Delta CE_{it} + \alpha_6 CE_{it-1} + \alpha_7 \Delta GFKF_{it} + \alpha_8 GFKF_{it-1} + \alpha_9 \Delta Social_{it} + \alpha_{10} Social_{it-1} +$$

$$\alpha_{11} \Delta OExp_{it} + \alpha_{12} OExp_{it-1}) + \mu_{it},$$

- **Robustness Tests:**

  Redundant Fixed Effects Likelihood tests

  Hausman test

  Unit root tests

Baseline results (EA19)

Fiscal Consolidations					
			ΔPriv_Ct		
			Country Fixed Effects		**OLS**
	C		-0.068**	(-2.463)	-0.069***	(-2.585)
λ_1	$Priv\_C_{t-1}$		-0.047***	(-3.465)	-0.049***	(-3.662)
λ_2	ΔY_t		0.580***	(17.28)	0.579***	(17.03)
λ_3	Y_{t-1}		0.000	(0.065)	0.002	(0.196)
β_1	ΔTax_t		0.102	(1.548)	0.133***	(2.793)
β_2	Tax_{t-1}		0.040**	(1.985)	0.036**	(2.295)
β_3	$\Delta ORev_t$		-0.042***	(-2.875)	-0.012	(-1.256)
β_4	$ORev_{t-1}$		-0.004	(-0.835)	-0.001	(-0.231)
β_5	ΔCE_t		0.108	(1.466)	-0.038	(-0.819)
β_6	CE_{t-1}	$x FE^C$	0.020	(1.242)	0.003	(0.251)
β_7	$\Delta GFKF_t$		0.018	(1.238)	0.031**	(2.090)
β_8	$GFKF_{t-1}$		-0.005	(-0.689)	0.010*	(1.741)
β_9	$\Delta Social_t$		-0.150***	(-3.568)	-0.012	(-0.401)
β_{10}	$Social_{t-1}$		-0.012	(-1.027)	-0.021**	(-2.017)
β_{11}	$\Delta OExp_t$		-0.021	(-1.095)	-0.001	(-0.067)
β_{12}	$OExp_{t-1}$		-0.014	(-1.429)	0.001	(0.135)
α_1	ΔTax_t		0.107***	(3.987)	0.122***	(3.930)
α_2	Tax_{t-1}		0.030**	(2.465)	0.030**	(2.426)
α_3	$\Delta ORev_t$		-0.006	(-1.334)	-0.010*	(-1.864)
α_4	$ORev_{t-1}$		0.001	(0.408)	0.000	(0.226)
α_5	ΔCE_t		0.050**	(2.019)	0.109***	(3.918)
α_6	CE_{t-1}	$x (1-FE^C)$	-0.001	(-0.153)	-0.000	(-0.046)
α_7	$\Delta GFKF_t$		0.018***	(2.762)	0.012*	(1.840)
α_8	$GFKF_{t-1}$		0.005*	(1.685)	0.001	(0.303)
α_9	$\Delta Social_t$		0.015	(0.909)	-0.027	(-1.370)
α_{10}	$Social_{t-1}$		-0.006	(-1.029)	-0.003	(-0.550)
α_{11}	$\Delta OExp_t$		0.020**	(2.075)	0.017	(1.610)
α_{12}	$OExp_{t-1}$		-0.000	(-0.136)	-0.000	(-0.012)
	N		703		703	
	R^2		0,719		0,705	
	Redundant FE Test		t-stat.	p-val.		
			1,94	0,01		

Note: The impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

Baseline results (EA19)

Long-Run Elasticities			
$-\beta_2/\lambda_1$	Tax		0,85
$-\beta_4/\lambda_1$	ORev		-0,09
$-\beta_6/\lambda_1$	CE	$\times FE^C$	0,43
$-\beta_8/\lambda_1$	GFKF		-0,11
$-\beta_{10}/\lambda_1$	Social		-0,26
$-\beta_{12}/\lambda_1$	OExp		-0,31
$-\alpha_2/\lambda_1$	Tax		0,65
$-\alpha_4/\lambda_1$	ORev		0,02
$-\alpha_6/\lambda_1$	CE	$\times (1-FE^C)$	-0,04
$-\alpha_8/\lambda_1$	GFKF		0,12
$-\alpha_{10}/\lambda_1$	Social		-0,13
$-\alpha_{12}/\lambda_1$	OExp		-0,01

Wald Test		
Null Hypotesis	t-stat.	p-val
$\beta_1-\alpha_1=0$	-0.07	0.95
$\beta_3-\alpha_3=0$	-2.27	0.02
$\beta_5-\alpha_5=0$	0.74	0.46
$\beta_8-\alpha_8=0$	-0.03	0.98
$\beta_7-\alpha_7=0$	-1.41	0.16
$\beta_9-\alpha_9=0$	-3.77	0.00
$\beta_{10}-\alpha_{10}=0$	-0.54	0.59
$\beta_{11}-\alpha_{11}=0$	-1.89	0.06

Baseline results (19 Member States)

- Cross-section fixed effects method is justified. The output is similar to OLS facing "normal times";

- The positive tax revenue elasticity indicates that consumers are behaving in a Ricardian way;

- All the remaining variables seem to have a Keynesian effect on private consumption during "normal times";

- Other revenue has a negative impact on private consumption during fiscal consolidations. The impact is stronger than in "normal times";

- Contrary to what happens in "normal times", social benefits shocks are recessive during fiscal consolidations;

- Other expenditure shocks are, at least, less effective to stimulate private consumption during fiscal consolidations (negative sign, but not statistically different from zero).

Narrative and CAPB approaches (10 MS)

Fiscal Consolidations

			$\Delta Priv\_Ct$			
			Narrative Approach		CAPB	
	C		-0,226***	(-4,378)	-0,213***	(-4,165)
λ_1	$Priv\_C_{t-1}$		-0,123***	(-5,473)	-0,113***	(-4,881)
λ_2	ΔY_t		0,410***	(9,851)	0,390***	(9,090)
λ_3	Y_{t-1}		0,020	(1,153)	0,014	(0,830)
β_1	ΔTax_t		0,123***	(2,888)	0,102	(1,122)
β_2	Tax_{t-1}		0,071***	(3,886)	0,094***	(3,957)
β_3	$\Delta ORev_t$		-0,018*	(-1,912)	-0,040**	(-2,435)
β_4	$ORev_{t-1}$		-0,002	(-0,762)	-0,008	(-1,253)
β_5	ΔCE_t	$x\,FE^C$	0,164***	(3,279)	0,099	(1,022)
β_6	CE_{t-1}		0,012	(0,951)	0,017	(0,919)
β_7	$\Delta GFKF_t$		0,015	(1,163)	0,045**	(2,148)
β_8	$GFKF_{t-1}$		-0,004	(-0,691)	-0,002	(-0,193)
β_9	$\Delta Social_t$		-0,064	(-1,574)	-0,232***	(-3,458)
β_{10}	$Social_{t-1}$		-0,012	(-1,224)	-0,029**	(-2,204)
β_{11}	$\Delta OExp_t$		0,023**	(1,999)	-0,041	(-1,427)
β_{12}	$OExp_{t-1}$		0,003	(0,469)	-0,008	(-0,587)
α_1	ΔTax_t		0,103***	(3,006)	0,146***	(4,587)
α_2	Tax_{t-1}		0,054***	(3,406)	0,063***	(4,094)
α_3	$\Delta ORev_t$		-0,009*	(-1,674)	-0,007	(-1,502)
α_4	$ORev_{t-1}$		-0,005	(-1,482)	-0,006**	(-2,144)
α_5	ΔCE_t		0,013	(0,701)	0,016	(0,874)
α_6	CE_{t-1}	$x\,(1-FE^C)$	0,029***	(2,757)	0,018*	(1,798)
α_7	$\Delta GFKF_t$		0,029***	(2,645)	0,032***	(3,676)
α_8	$GFKF_{t-1}$		0,003	(0,739)	0,003	(0,753)
α_9	$\Delta Social_t$		-0,024	(-1,107)	0,004	(0,189)
α_{10}	$Social_{t-1}$		-0,011	(-1,468)	-0,015**	(-2,213)
α_{11}	$\Delta OExp_t$		-0,030**	(-2,092)	-0,008	(-0,771)
α_{12}	$OExp_{t-1}$		0,004	(0,701)	0,005	(0,917)
	N		357		357	
	R^2		0,707		0,694	

Long-Run Elasticities

			Narrative Approach	CAPB
$-\beta_2/\lambda_1$	Tax		0,59	0,09
$-\beta_4/\lambda_1$	ORev		0,01	-0,05
$-\beta_6/\lambda_1$	CE	$x\,FE^C$	0,07	0,31
$-\beta_8/\lambda_1$	GFKF		-0,18	-0,05
$-\beta_{10}/\lambda_1$	Social		-0,40	0,03
$-\beta_{12}/\lambda_1$	OExp		0,07	-0,04
$-\alpha_2/\lambda_1$	Tax		-0,09	0,17
$-\alpha_4/\lambda_1$	ORev		-0,08	-0,03
$-\alpha_6/\lambda_1$	CE	$x\,(1-FE^C)$	0,20	0,11
$-\alpha_8/\lambda_1$	GFKF		0,15	0,02
$-\alpha_{10}/\lambda_1$	Social		0,06	-0,01
$-\alpha_{12}/\lambda_1$	OExp		0,11	0,02

Narrative and CAPB approaches
(10 Member States)

- Private consumption has a non-keynesian response to a tax revenue shock - both in the short and long-run;

- On the Narrative Approach:
  - Contrary to what occurs during fiscal consolidations, an increase in other expenditures seems to have a recessive impact during normal times.

- On the CAPB Approach:
  - Under austerity policies, with the exception of the investment and other revenue, the statistically significant variables have a non-keynesian behavior;
  - Once again, social benefits seem to be recessive during fiscal consolidations.

		EMU ($Y_t - Y^w_t$)		EMU		1-EMU	
		Fiscal Consolidations					
		$\Delta Priv\_C_t$					
	C	0.062	(0.692)	-0.021	(-0.163)	-0.084**	(-2.137)
λ_1	Priv_C$_{t-l}$	-0.115***	(-4.845)	-0.102***	(-3.148)	-0.048***	(-2.833)
λ_2	ΔY_t	0.424***	(5.823)	0.335***	(6.457)	0.689***	(15.46)
λ_3	Y$_{t-l}$	0.067**	(2.168)	0.020	(0.646)	-0.005	(-0.285)
λ_4	$\Delta(Y_t - Y^w_t)$	0.081	(1.061)				
λ_5	Y$_{t-l}$-Y$^w_{t-l}$	0.000	(0.026)				
β_1	ΔTax$_t$	0.164*	(1.912)	0.183*	(1.734)	0.104	(1.056)
β_2	Tax$_{t-l}$	0.020	(0.755)	0.050	(1.289)	0.023	(0.705)
β_3	ΔORev$_t$	-0.023***	(-3.370)	-0.071***	(-2.743)	-0.023	(-1.308)
β_4	ORev$_{t-l}$	-0.001	(-1.191)	-0.013	(-0.822)	-0.001	(-0.228)
β_5	ΔCE$_t$	0.1177	(-0.097)	0.142	(1.357)	0.117	(1.084)
β_6	CE$_{t-l}$	0.005	(0.257)	0.006	(0.224)	0.048*	(1.852)
β_7	ΔGFKF$_t$	0.045***	(2.704)	0.047**	(2.451)	-0.046*	(-1.755)
β_8	GFKF$_{t-l}$	0.011	(1.203)	-0.000	(-0.032)	-0.016	(-1.475)
β_9	ΔSocial$_t$	-0.195***	(-2.922)	-0.146**	(-2.316)	-0.195***	(-2.822)
β_{10}	Social$_{t-l}$	-0.004	(-1.068)	-0.030	(-1.306)	-0.004	(-0.256)
β_{11}	ΔOExp$_t$	-0.069	(-0.605)	0.015	(0.474)	-0.069**	(-2.097)
β_{12}	OExp$_{t-l}$	-0.017	(-0.180)	0.015	(0.742)	-0.017	(-1.296)
α_1	ΔTax$_t$	0.186***	(5.193)	0.263***	(6.526)	0.061*	(1.681)
α_2	Tax$_{t-l}$	0.049**	(2.313)	0.064**	(2.268)	0.039*	(1.956)
α_3	ΔORev$_t$	-0.010	(-0.447)	-0.001	(-0.115)	-0.010*	(-1.786)
α_4	ORev$_{t-l}$	0.007	(1.327)	0.003	(0.270)	-0.001	(-0.417)
α_5	ΔCE$_t$	0.0737	(-1.074)	-0.021	(-0.473)	0.073**	(2.300)
α_6	CE$_{t-l}$	0.0020**	(-2.282)	-0.044*	(-1.865)	0.002	(0.125)
α_7	ΔGFKF$_t$	0.033***	(3.911)	0.026***	(2.669)	0.009	(1.021)
α_8	GFKF$_{t-l}$	0.021***	(3.225)	0.015*	(1.862)	-0.000	(-0.168)
α_9	ΔSocial$_t$	0.039	(1.564)	0.093**	(2.203)	0.016	(0.849)
α_{10}	Social$_{t-l}$	-0.011	(-0.738)	-0.013	(-0.827)	-0.011	(-1.360)
α_{11}	ΔOExp$_t$	0.019*	(1.687)	0.012	(0.894)	0.034**	(2.530)
α_{12}	OExp$_{t-l}$	0.0035**	(-2.156)	0.005	(0.313)	0.003	(0.508)
	N	428		280		423	
	R²	0.789		0.793		0.720	
	Redundant FE Test	t-stat.	p-val	t-stat.	p-val.	t-stat.	p-val.
		2.56	0.00	2.10	0.01	2.23	0.00

Note: the β rows are multiplied by x FE^C; the α rows are multiplied by x (1-FE^C).

Yav: represents the natural logarithm of the (weighted) average of the EMU output per capita (after joining the Union).

Robustness I:
EMU membership

- The non-keynesian behaviour of both other expenditure and investment are no longer perceived after countries joined the EMU. Hence, after the EMU, it was harder to observe expansionary fiscal consolidations for these budgetary categories.

- Regarding social benefits, we found a negative elasticity both before and after the EMU, with a significant and expansionary (keynesian) impact during "normal times" in the EMU.

Robustness II:
Consolidations and expansions

	Fiscal Episodes		$\Delta Priv\_C_t$	
	C		-0.066**	(-2.384)
λ_2	$Priv\_C_{t-1}$		-0.048***	(-3.532)
λ_3	ΔY_t		0.569***	(15.73)
λ_4	Y_{t-1}		0.001	(0.167)
β_1	ΔTax_t		0.106	(1.598)
β_2	Tax_{t-1}		0.039*	(1.961)
β_3	$\Delta ORev_t$		-0.042***	(-2.880)
β_4	$ORev_{t-1}$		-0.004	(-0.922)
β_5	ΔCE_t		0.108	(1.460)
β_6	CE_{t-1}		0.019	(1.213)
β_7	$\Delta GFKF_t$	x FE^C	0.017	(1.219)
β_8	$GFKF_{t-1}$		-0.005	(-0.769)
β_9	$\Delta Social_t$		-0.152***	(-3.610)
β_{10}	$Social_{t-1}$		-0.011	(-0.982)
β_{11}	$\Delta OExp_t$		-0.022	(-1.111)
β_{12}	$OExp_{t-1}$		-0.013	(-1.351)
α_1	ΔTax_t		0.137***	(2.869)
α_2	Tax_{t-1}		0.035**	(2.210)
α_3	$\Delta ORev_t$		-0.012	(-1.250)
α_4	$ORev_{t-1}$		-0.001	(-0.276)
α_5	ΔCE_t		-0.042	(-0.920)
α_6	CE_{t-1}		0.006	(0.389)
α_7	$\Delta GFKF_t$	x FE^E	0.031**	(2.107)
α_8	$GFKF_{t-1}$		0.010*	(1.799)
α_9	$\Delta Social_t$		-0.016	(-0.540)
α_{10}	$Social_{t-1}$		-0.021**	(-2.047)
α_{11}	$\Delta OExp_t$		-0.003	(-0.196)
α_{12}	$OExp_{t-1}$		0.000	(0.042)

	Fiscal Episodes		$\Delta Priv\_C_t$	
ϕ_1	ΔTax_t		0.124***	(3.362)
ϕ_2	Tax_{t-1}		0.028**	(2.141)
ϕ_3	$\Delta ORev_t$		-0.005	(-0.759)
ϕ_4	$ORev_{t-1}$		0.000	(0.279)
ϕ_5	ΔCE_t		0.082**	(2.570)
ϕ_6	CE_{t-1}	x $(1-FE^C)$ x	-0.003	(-0.322)
ϕ_7	$\Delta GFKF_t$	$(1-FE^E)$	0.011	(1.458)
ϕ_8	$GFKF_{t-1}$		0.003	(0.833)
ϕ_9	$\Delta Social_t$		0.003	(0.142)
ϕ_{10}	$Social_{t-1}$		-0.002	(-0.457)
ϕ_{11}	$\Delta OExp_t$		0.028*	(1.670)
ϕ_{12}	$OExp_{t-1}$		0.001	(0.334)
	N		703	
	R^2		0.726	
	Redundant FE Test		t-stat.	p-val.
			1.77	0.03

Robustness II:
Consolidations and expansions

Wald Test		
Consolidations vs Expansions		
Null Hypotesis	t-stat.	p-val
$\beta_1-\alpha_1=0$	1.64	0.10
$\beta_3-\alpha_3=0$	-1.66	0.10
$\beta_5-\alpha_5=0$	1.71	0.09
$\beta_7-\alpha_7=0$	-0.64	0.52
$\beta_8-\alpha_8=0$	-1.82	0.07
$\beta_9-\alpha_9=0$	-2.67	0.01
$\beta_{10}-\alpha_{10}=0$	0.68	0.50
Consolidations vs Normal Times		
Null Hypotesis	t-stat.	p-val
$\beta_1-\phi_1=0$	-0.25	0.80
$\beta_3-\phi_3=0$	-2.32	0.02
$\beta_5-\phi_5=0$	0.32	0.75
$\beta_9-\phi_9=0$	-3.40	0.00
$\beta_{11}-\phi_{11}=0$	-1.96	0.05
Expansions vs Normal Times		
Null Hypotesis	t-stat.	p-val
$\alpha_7-\phi_7=0$	1.17	0.24
$\alpha_8-\phi_8=0$	-0.07	0.94
$\alpha_{10}-\phi_{10}=0$	-1.81	0.07
$\alpha_{11}-\phi_{11}=0$	-1.41	0.16

Robustness II:
Consolidations and expansions

- During fiscal expansions, taxes and investment are significantly expansionary, both in the short and in the long run;

- Once again, social benefits showed a negative elasticity in the context of fiscal consolidations;

- Other revenue and social benefits are more recessive during consolidations than in both expansions and "normal times", and tax increases have a more expansionary effect.

Main Conclusions

Results summary: Short-run elasticities

Fiscal instrument	Full sample (CAPB)		Sub-sample (CAPB)		Sub-sample (Narrative)		EMU (CAPB)		Non-EMU (CAPB)		Full sample (CAPB with Expans.)		
	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Consol.	Normal times	Expans.	Consol.
Δ Tax	0.107		0.146		0.103	0.123	0.263	0.183	0.061		0.124	0.137	
Δ Orev		-0.042		-0.040	-0.009	-0.018		-0.071	-0.010				-0.042
Δ CE	0.050					0.164			0.073		0.082		
Δ GFKF	0.018		0.032	0.045	0.029		0.026	0.047		-0.046		0.031	
Δ Social		-0.150		-0.232			0.093	-0.146		-0.195			-0.152
Δ OExp	0.020				-0.030	0.023			0.034	-0.069	0.028		

Only statistically-significant short-run elasticities.

- Positive tax revenue elasticities indicate that consumers have a Ricardian behavior;

- Social benefits have a non-keynesian effect on private consumption, during consolidations;

- Using a narrative approach, private consumption continues to exhibit a non-keynesian response to tax increases, and other expenditures have a recessive impact during "normal times";

- Social benefits are more contractionary in consolidations than in both expansions and "normal times";

- After the launch of the EMU, expansionary fiscal consolidations became harder to observe, since other expenditures and investment lost their non-keynesian role.

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Thank you!

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