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Fiscal episodes in the EMU: Elasticities and non-keynesian effects*

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Abstract

We estimate short- and long-run elasticities of private consumption for fiscal instruments, using a Fixed Effects model for the 19-euro area countries during the period of 1960-2017, to assess how fiscal elasticities vary during fiscal episodes. According to the results, positive "tax revenue" elasticities indicate that consumers have a Ricardian behaviour, whereby they perceive an increase in taxation to be a sign of future government spending. "Social benefits" appear to have a non-keynesian effect on private consumption. In addition, using a narrative approach to identify fiscal consolidations, it is seen that private consumption continues to exhibit a non-keynesian response to tax increases, both in the short and long-run, and "other expenditures" have a recessive impact during "normal times". Furthermore, "social benefits" are more contractionary in consolidations than in both expansions and "normal times". Additionally, after the launch of the EMU, expansionary fiscal consolidations became harder to observe, and "other expenditure" and "investment" lost their non-keynesian role.

Keywords: Non-Keynesian Effects, Fiscal Episodes, Fiscal policy, Fiscal Elasticities, EMU
JEL Codes: B22; E12; E62

* The usual disclaimer applies and all remaining errors are the authors' sole responsibility. The opinions expressed herein are those of the authors and not of their employers.

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1. Introduction

During the last decade, European countries implemented a large fiscal consolidation to reduce their budget deficits and government debt ratios. However, in several cases, the empirical evidence seems to contradict the theoretical predictions, where fiscal consolidations are followed by an increase in output. During the same period, there were also episodes where the symmetric effect occurred, i.e., in spite of stimulating the same GDP components, fiscal expansions led to recessive results. The literature labels such episodes as *Non-Keynesian Effects of Fiscal Policy* (NKEFP), despite the inexistence of either a consensus regarding the existence of a crowding in, or a crowding out effect induced by public expenditure, or the non-linearity of the macroeconomic impacts of fiscal policy.

The non-keynesian effects of fiscal policy - more precisely the expansionary fiscal consolidations, have encouraged research about the effectiveness of fiscal policy during the last few years, following the external interventions that occurred in the Eurozone, after the Global and Financial Crisis (GFC) of 2008-2009, which notably involved fairly demanding fiscal adjustments. In this context, our aim is to specifically revisit which fiscal instruments may have a non-keynesian effect on private consumption during fiscal episodes.

The paper is organised as follows. Section 2 is the literature review. Section 3 methodologically identifies the discretionary fiscal episodes and the identification method. Section 4 presents the methodology, data, and the empirical assessment and, lastly, Section 5 concludes.

2. Literature Review

Keynesian Effects

Developed in the context of the Great Depression, the Keynesian theory focuses on the relevance of expenditure in the economy and in aggregate demand, namely its effects on inflation and output. In the Keynesian perspective, fiscal policy has an effective impact on aggregate demand (especially on national consumption and income) which passes through spillover effects (Bernheim, 1989). In order to advocate the stabilising function of fiscal policy, which emphasises the need for government intervention, this theory suggests that the size of government spending together with the tax burden should vary according to the business cycle, namely through the application of automatic stabilizers (Auerbach and Gorodnichenko, 2012).

Following this approach, and by increasing government expenditure, the Government can have the ability to stimulate the labour market, induce private consumption, and encourage private investment. The theory assumes that a certain share of economic resources is not used,

and that a proportion of the population is liquidity constrained or economically myopic, having a higher propensity to consume and respond quicker to an income shock (Brinca et al., 2016).

On the other hand, a fiscal adjustment (in the form of tax increases or cuts in public expenditure) would be expected to generate a temporary negative impact on aggregate demand, and consequently, on GDP. However, there is no consensus in the literature regarding the best instruments that should be used to implement a fiscal consolidation with the least possible economic cost. For instance, some authors, such as Afonso and Leal (2019), argue that government spending has a higher multiplier than that of increasing taxes, whilst Barrel et al. (2012) defend that multipliers generated by income taxes and benefits adjustments are small, as they can be offset by a temporary change in savings rate. Other authors, such as Alesina et al. (2017) defend that cuts in government spending and transfers seem to be less recessive than tax-based consolidations. In addition, Alesina et al. (2018) argue that spending cuts not only usually have a very small output cost, but they might even be expansionary in some cases.

Several studies[2] defend that fiscal impacts on output are substantially larger during recessions than during expansionary phases, as is the impact on total employment. Furthermore, such an effect might be even higher should the spending shock be simultaneous with an economic recovery, despite the fact that this shock might generate deflationary responses during downturns (Auerbach and Gorodnichenko, 2011).

The level of government debt also plays a role in the multiplier effect of fiscal policy, due to the fact that the output response to a fiscal shock might not be statistically different from zero in countries with high debt ratios (say, above 60% of GDP). Accordingly, such a fiscal stimulus could have a neutral, or even negative impact on long-run output (Ilzetski et al., 2013).

Nevertheless, it seems relevant to highlight the fact that budget rigidities can constrain the ability of policy makers to properly implement fiscal policies, thus conditioning the size and structure of government budgets. According to Muñoz and Olaberria (2019), high shares of rigid spending in a budget contribute to the onset of fiscal distress. For instance, high expenditure on pensions reduces the probability of a fiscal consolidation, especially in countries with a lower level of institutional quality.

Non-Keynesian Effects

The effects behind the so-called non-keynesian episodes are usually divided into those which are linked with the consumption channel, and those which are linked with the investment

[2] See, for example, Afonso and Leal (2019) or Stockhammer et al. (2016).

channel. With regards to the consumption channel, in other words, the hypothesis that a fiscal consolidation can increase private consumption, non-keynesian episodes occur due to expectations, wealth, and substitution effects.

The expectations effect occurs when there is an improvement in the expectation of consumers regarding future tax liabilities, which can lead to a reduction in precautionary savings (Feldstein, 1982) and also to an increase in the present discounted value of disposable income, which stimulates private consumption. The opposite also occurs when facing a deterioration of expectations, following the rationale behind the Ricardian theory.

Regarding the wealth effect, a fall in interest rates, together with an increase in assets' market value and the opportunity cost of savings, all lead to households increasing their day-to-day consumption (McDermott and Wescott, 1996).

The substitution effect consists of the substitution of public consumption by private consumption. Under this perspective, a cut in government expenditure frees up more economic resources (such as the labour force) and increases the market space, creating room for the private sector to expand (Giavazzi and Pagano, 1990).

However, it is important to highlight that a fiscal consolidation can only stimulate private consumption if the impact is large enough to offset the direct effect on disposable income. In addition, should the reduction in public expenditure be small and temporary, then private consumption may not create an expansionist effect, due to a change in households' expectations regarding future budget deficits and debt dynamics (Afonso, 2001).

As argued by Barro (1974), with regards to inter-generational redistribution, the financing of bonds issued by present generations will be paid by the issue of new bonds, or through increases in the tax burden on future generations, thus compromising these generations' welfare.

Moving on to the investment channel, a fiscal consolidation can be expected to lead to an increase in private investment (Alesina et al, 1998). According to the literature, this investment can become the main source of expansionary consolidations, and it is one of the largest subjects for discussion regarding this issue. The first inherent effect is that of interest rates, which consists of a sort of "credibility effect", which assumes that a decrease in government budget deficits is followed by a decrease in the real interest rate, due to a fall in the risk default premium[3] (Alesina et al., 1998). This reduction consequently leads to a boost in aggregate

[3] According to Barbosa and Costa (2010), the risk premium depends on each issuer's idiosyncratic factors and corresponds to the return required by investors to offset the risk that future cash flows could be different from those agreed, due to the occurrence of a default.

demand through private demand and generate incentives for private investment. Another situation where the interest rate effect can be observed is when there is a decrease of pressure from capital markets, as with lower budget deficits, governments have less financing needs.

The second inherent effect is on the labour market. Under certain conditions, fiscal consolidations can induce a wage moderation, which consequently leads to an increase in employment, to an improvement in economic competitiveness, and next to a stimulation of investment. According to Alesina and Perotti (1997), unit labour costs are the main factor behind expansionary fiscal consolidations. For whilst in a typical neoclassic model, labour supply depends on income and wealth effects, the authors defended that these effects are not so relevant. However, in a unionised labour market, increases in taxes can lead to strong increases in unit labour costs, reducing competitiveness. In this context, Carvalho (2009) found evidence that fiscal consolidations are highly probable to be successful if they are adequately combined with structural reforms.

In addition, with regards the composition of fiscal consolidations, Cournède and Gonand (2006) argued that consolidations based on tax increases reduce investment incentives and offset interest rate and labour market effects, whereas spending cuts and welfare payments are more likely to provide expansionary results. On the other hand, Sutherland (1997) argued that in the case of significant amounts of government debt, a tax increase could increase private consumption, and thus postpone the passing on of the costs of fiscal consolidation to future generations, thus discouraging private saving.

A few critical conditions are required to provide the possibility for an expansionary fiscal consolidation. The first is related to fiscal adjustment composition (as argued in the previous paragraph), where consolidations based on spending cuts have a higher hypothesis of stimulating output (Alesina and Perotti, 1995). Another condition is the initial state of public finances, where, as argued by Bertola and Drazen (1993), the policy effect depends on the expectations regarding future policies. According to Bertola and Drazen's model, in a difficult situation, a perception of improvement (due to cuts in public expenditure) increases consumption. However, the result is different if the spending cuts take place simultaneously with a tax increase.

The size and persistence of fiscal consolidation also plays a conditioning role, being a key factor for the success of the fiscal consolidation, i.e. by culminating in a reduction of the debt-to-GDP ratio (McDermott and Wescott, 1996). Giavazzi and Pagano (1996), when studying OECD countries, reported that the impact of changes in public consumption can have different results, according to both the size and persistence of fiscal consolidation. Whereas normal

reductions in government consumption tend to lead to reductions in private consumption, if the shock is strong and persistent enough, this can lead to the opposite effect. Furthermore, increases in transfers can also increase the level of private consumption, if these increases are persistent.

Empirical Results

In terms of the empirical results concerning the fiscal instruments behind non-keynesian effects, Afonso (2010), using a fixed effects panel data strategy, realised that the long-run elasticity of private consumption is negative. In addition, a tax increase (during a fiscal consolidation) can have a positive impact on private consumption in the long run. In the case of social transfers, there is negative long-run elasticity (although only after the Maastricht Treaty signature).

Afonso and Jalles (2014) studied the elasticities for OECD countries with four different definitions of fiscal consolidation episodes. The results showed that lower government expenditure increases private consumption. Furthermore, private investment reveals a non-keynesian response and social transfers have a negative impact on private investment.

With a similar specification, Afonso and Martins (2016) argued that, in fiscal consolidations, consumers do not demonstrate a Ricardian behavior, and rather there is a positive short-run elasticity of private consumption to income and to general government final consumption, in line with the keynesian theory. However, there is evidence of a non-keynesian effect in the absence of a fiscal consolidation, with a positive short-run elasticity of taxes to private consumption. In addition, they report that Keynesian effects prevail when fiscal consolidations are not matched by monetary easing.

Table 1 provides a brief summary of the results for fiscal elasticity (on private consumption) presented in various existing empirical analysis. Accordingly, when compared to previous studies, our paper provides an updated and more detailed analysis of fiscal elasticities and provides insights into how the results may change following a different identification approach.

Table 1 – Empirical results in the related literature: summary

Authors (year)	Methodology	Sample	Period	Main results
Giavazzi and Pagano (1996)	OLS / 2SLS	OECD (19 countires)	1970-2000	1. Transfers reveals a positive elasticity during "normal times"; 2. Facing fiscal episodes, taxes and government consumption have significant positive and negative impacts, respectively; 3. In both OLS and 2SLS methods, taxes and transfers appear to have non-keynesian effects on private consumption.
Miller and Russek (1999)	OLS Pooled Regression	OECD (19 countires)	1970-1996	1. There is some evidence of non-Keynesian effects; 2. Unusual fiscal contractions magnify the positive and negative effects of government spending and revenue on real private consumption spending.
van Aarle and Garretsen (2001)	OLS	EMU (14 countries)	1990-1998	1. The evidence for non-linearities in the effects of fiscal adjustments is limited during the transition period to the EMU; 2. There is no evidence of non-linearities in both taxation and transfers; 3. Government consumption has a positive influence on private spending;
		EU and non-EU	1970-2000	4. The effects of fiscal adjustments on private spending, with the possible exception of transfers, appear to have been relatively small.
Weyerstrass et al. (2006)	Fixed Effects	Finland, France, Ireland, Italy, Netherlands	1970-2005	1. Limited evidences of non-keynesian effects; 2. For higher debt levels, the impact of government spending on private consumption is much smaller; 3. The effects of government investment on private consumption display a pattern similar to the one of taxes (negative).
		EU (9 countries)	1977-2004	1. Similar results for the impact of tax changes facing low and high debt ratios; 2. Government spending has a positive impact on private consumption, while investment has a negative impact.
Afonso (2010)	Fixed Effects	EU15	1970-2005	1. The long-run elasticity of private consumption with respect to general government final consumption is negative; 2. A tax raise, together with a fiscal consolidation episode, could have a positive long-run effect on private consumption; 3. The long-run elasticity of social transfers is statistically significant and negative.
Afonso and Jalles (2014)	IV - GLS	OECD	1970-2010	1. Lower final government consumption increases private consumption; 2. There is some evidence of non-Keynesian effects for private investment.
Afonso and Martins (2016)	Fixed Effects	EMU (14 countries)	1970-2013	1. There is a positive relationship between general government consumption expenditure and private consumption; 2. Consumers are not behaving in a Ricardian way; 3. There is evidences of non-Keynesian effects in the absence of fiscal consolidations (tax-based).

3. Identifying Fiscal Episodes

Appendix 1 reports the summary statistics of the variables. Our data set comes from the EC AMECO Database.

There are several ways to identify a fiscal episode, such as the implementation of clear policy actions (fiscal expansions or consolidations). When analysing the stance of fiscal policies, the literature highlights the structural balance, which results from the budget balance

(in percentage of GDP or potential GDP), excluding cyclical and one-off effects. For the computation of the Cyclically Adjusted Balance (CAB), following the EU budgetary surveillance methodology, the CAB is derived as (Larch and Turrini, 2010):

$$CAB_t = BB_t - \varepsilon * OG_t, \qquad (1)$$

where, BB_t represents the nominal budget balance, OG_t the output gap (difference between the actual and potential output), and ε the budgetary sensitivity parameter. This parameter is calculated by aggregating the elasticities of individual revenue (η_R) and unemployment-related expenditure ($\eta_{G,u}$), where they are weighted by the share of the total current taxes and total current primary expenditure, respectively (using the OECD and the European Commission Output Gap Working Group methodology). Thus, the difference yields the sensitivity parameter, as calculated by:

$$\varepsilon = \varepsilon_R - \varepsilon_G \qquad (2)$$

$$\varepsilon_R = \eta_R \frac{R}{Y} \; ; \quad \varepsilon_G = \eta_G \frac{G}{Y} \qquad (3)$$

where,

$$\eta_R = \sum_{i=1}^{4} \eta_{R,i} \frac{R_i}{R} \qquad \eta_G = \eta_{G,u} \frac{G_u}{G}. \qquad (4)$$

Whilst the IMF (1993) defines a fiscal episode as being a change of at least 1.5 p.p. in the structural balance during two consecutive years, other organisations, such as the OECD (1996), only considered variations above 3 p.p. in the structural balance. However, the structural balance might not be capable to capture all the changes in the economic environment, due to liquidity conditions, inflation, and consequently the effects in real interest rates. For this reason, the best indicator for measuring the discretionary orientation of fiscal policy is the structural primary balance, i.e., the structural balance, excluding interest payments.

Accordingly, when considering the structural primary balance, Alesina and Perotti (1995) identify fiscal episodes as being: i) years when the primary structural balance varies more than one standard deviation from the country average, or; ii) years when there is a change of at least 1.5 p.p. in the primary structural balance.

In our study, we consider the definition made by Alesina and Ardagna, (2010), where a fiscal episode, expansion (FE^E) or contraction (FE^C) occurs when there is a change of at least 1.5 p.p. in the cyclically-adjusted primary balance (CAPB).

$$FE^E = \begin{cases} 1; \ \Delta CAPB \leq -1.5 \\ 0; \Delta CAPB > -1.5 \end{cases} ; \ FE^C = \begin{cases} 1; \ \Delta CAPB \geq 1.5 \\ 0; \Delta CAPB < 1.5 \end{cases}. \quad (5)$$

In practical terms, we need to be aware that a series break occurs in 1995, which represents the transition from the former definitions to the ESA 2010. For this reason, our estimations do not consider fiscal episodes that occurred during 1995. Table 2 reports all the fiscal episodes, based on the CAPB thresholds as defined in (5).

Table 2 – Fiscal episodes by date, CAPB-based

Fiscal Episodes			
Country	**Expansions** *ΔCAPB<-1.5*	**Consolidations** *ΔCAPB>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.

Still within this context, the IMF proposed an alternative approach to determine fiscal episodes. Indeed, Devries et al. (2011) present a dataset of fiscal consolidations based on a so-called narrative approach. These fiscal consolidation episodes were constructed based on policy documents, central banks reports, Converge and Stability Programmes submitted to the European Commission, and IMF and OECD reports.

Regarding this issue, Guajardo et al. (2014) criticised the CAPB approach as "*being imprecise and biased toward overstating the potential expansionary effects of fiscal adjustments*". Yang et al. (2015) tried to understand which approach is the most accurate to analyse the macroeconomic effects of fiscal policy: either the one based on changes in the CAPB, or the narrative approach based on historical records of policy measures. These authors concluded that, although the narrative approach could be considered superior for identifying fiscal episodes correctly, the CAPB has the advantage of being much easier to implement and apply. These authors also argued that, contrary to the narrative approach, the empirical literature based on a CAPB approach supports the existence of non-keynesian effects.

More recently, Gupta et al. (2017) updated the above-mentioned IMF database, by including observations up until 2015. Following this discussion, we made a comparison of the fiscal consolidations captured by our threshold and those identified in both Devries et al. (2011) and Gupta et al. (2017). It should be noted that the samples only have 10 countries in common during the period of 1978-2015. Table 3 compares the CAPB-based fiscal consolidation episodes with the so-called "narrative approach" consolidation episodes.

One can observe that the CAPB approach is more demanding than the narrative approach. For while the CAPB approach only captures 51 episodes, the narrative one captures 131 (34.5% of the entire sample). Furthermore, we observe that only 34 fiscal consolidation episodes were identified simultaneously with both approaches. Since the more lenient requirements of the narrative approach can raise doubts about this approach's ability to effectively distinguish fiscal episodes from "normal times", we would argue that the traditional CAPB approach might be an appropriate method to pursue our study. Furthermore, the use of a rule to determine fiscal episodes, based on the CAPB, also ensures a certain level of homogeneity across countries, although this is more difficult to carry out, based on economists' assessments of several different policy reports for the country sample.

Table 3 – 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).

In our next step, we consider as a non-keynesian episode, those episodes where: i) the average real GDP growth during the two years after the fiscal contraction is greater than the growth during the previous two years (before expansionary consolidations), and; ii) real GDP growth during the two years after the expansions is smaller than the average growth during the previous two years (before recessive expansions). Table 4 presents these episodes.

One can conclude that, from the 81 fiscal expansionary episodes analysed (reported in Table 2), 52 of them led to recessive results. This can be explained by the application of not completely successful countercyclical policies, in an attempt to invert the business cycle. The beginning of the GFC is an example of this hypothesis, where during the period between 2007 and 2009, 19 of the 52 recessive expansions occurred. Additionally, we identify expansionary fiscal consolidations in 45 of the 98 contractionary fiscal episodes (see Table 2 and Table 4).

In order to further illustrate this issue, in Appendix 3 we provide a case study analysis from Portugal - a small Euro Area open economy, which was subject to an international financial support programme in the aftermath of the GFC.

Table 4 – 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.

4. Empirical Assessment

4.1. Baseline results

Using annual data for the 19 Euro Area countries for the period of 1960-2017 (data sourced from the AMECO database), we estimate the short- and long-run elasticities of private consumption to fiscal instruments, using dummies to identify the fiscal episodes. We focus on understanding how the fiscal elasticities vary during fiscal consolidations (in comparison to "normal times") and also try to find possible sources of non-keynesian effects.

Therefore, we opted to use a Fixed Effects model to assess the impact of fiscal variables throughout time, assuming that the time-invariant characteristics are country-specific. As the fixed effects model removes the effect of time-invariant characteristics from the predictor variables, we believe that this is a suitable approach. Furthermore, we carried out a redundant Fixed Effects Likelihood test for all the estimations, where the null hypothesis (no unobserved heterogeneity) was rejected.

The baseline specification is:

$$\Delta Priv\_C_{it} = c_i + \lambda_1 Priv\_c_{it-1} + \lambda_2 \Delta Y_{it} + \lambda_3 Y_{t-1} + FE^C \text{ X } (\beta_1 \Delta Tax_{it} + \beta_2 Tax_{it-1} + \beta_3 \Delta ORev_{it} + \beta_4 ORev_{it-1} + \beta_5 \Delta CE_{it} + \beta_6 CE_{it-1} + \beta_7 \Delta GFKF_{it} + \beta_8 GFKF_{it-1} + \beta_9 \Delta Social_{it} + \beta_{10} Social_{it-1} + \beta_{11} \Delta OExp_{it} + \beta_{12} OExp_{it-1}) + (1 - FE^C) \text{ X } (\alpha_1 \Delta Tax_{it} + \alpha_2 Tax_{it-1} + \alpha_3 \Delta ORev_{it} + \alpha_4 ORev_{it-1} + \alpha_5 \Delta CE_{it} + \alpha_6 CE_{it-1} + \alpha_7 \Delta GFKF_{it} + \alpha_8 GFKF_{it-1} + \alpha_9 \Delta Social_{it} + \alpha_{10} Social_{it-1} + \alpha_{11} \Delta OExp_{it} + \alpha_{12} OExp_{it-1}) + \mu_{it}, \quad (6)$$

where *i* and *t* identifies the country and sample, *FE* is a dummy variable for fiscal episodes (consolidations in this specification) which assumes 1 in the case of a consolidation, and 0 otherwise. *Y* reflects the output, and the remaining variables represent several general government budgetary components: *Tax* – tax revenue; *ORev* – other revenue; *CE* – compensation to employees; *GFKF* – public investment; *Social* – social benefits; *OExp* – other expenditure. Furthermore, c_i is an autonomous term that captures countries' individual characteristics, and μ_{it} represents disturbances. The data is used as a natural logarithm of real per capita values. Table 5 presents the baseline results.

The first conclusion that we can make from Table 5 is that the cross-section fixed effects method is justified, as the result of the Redundant Fixed Effects Test rejects the null-hypothesis. Accordingly, our analysis focuses on the first two columns of the output in Table 5.

Regarding short-run elasticities, "Tax revenue" (0.11), "Compensation to employees" (0.05), "Investment" (0.02), and "Other expenditure" (0.02) all have a statistically-significant expansionary effect during "normal times". Furthermore, when fiscal consolidations occur, only "Other revenue" (-0.04) and "Social benefits" (-0.15) appear to have a significant (negative) impact on private consumption. In terms of long-run elasticities, both "Taxes" (0.65) and "Investment" (0.12) show significant effects on long-run private consumption during "normal times", while the "Tax revenue" budgetary item seems to have the only significant (0.85) elasticity when fiscal consolidations occur.

Table 5 – Baseline results, using fiscal consolidations (19 Euro Area countries)

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).

Long-Run Elasticities			
$-\beta_2/\lambda_1$	Tax	x FE^C	0,85
$-\beta_4/\lambda_1$	ORev		-0,09
$-\beta_6/\lambda_1$	CE		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	x $(1-FE^C)$	0,65
$-\alpha_4/\lambda_1$	ORev		0,02
$-\alpha_6/\lambda_1$	CE		-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**

Applying the Wald Test (last panel in Table 5), we found that "Other revenue", "Social benefits", and "Other expenditure" all have statistically different short-term elasticities, with the worst impact occurring during fiscal consolidations. However, it is not possible to conclude that the budgetary item "Other expenditure" has a negative (different from zero) impact during "normal times".

Despite the fact that no major differences were observed in fiscal consolidation periods, the positive "Tax revenue" elasticity indicates that consumers are behaving in a Ricardian way, as they perceive a future increase in taxation to be a sign of future additional government spending. These results are less in line with the findings of Alesina et al. (2017), where it is argued that cuts in government spending and in transfers are less recessive than tax-based consolidations.

Furthermore, the response of private consumption to "Social benefits" changes during fiscal consolidations could well be a source of non-keynesian episodes (expansionary consolidations), whereas cuts in expenditure stimulate private consumption. One can hypothesise that such

behaviour might be a consequence of fiscal sustainability perceptions (related to ageing costs and debt management) and of hypothetical perverse incentives created by the attribution of social benefits during a long-time range.

Another possible reason for the negative elasticity of "Social benefits" has to do with the propensity to save. As observed in several European countries during the GFC, the expected saving rates (related to precautionary reasons) broke the link between available income and the consumption level. Indeed, savings rates even increased. In addition, since strong pro-cyclical fiscal consolidations (episodes) occurred during the crisis, Social benefits increased, due to high unemployment levels being registered in parallel with other spending cuts that had the effect of reducing available income. Consumers could also perceive a substitution effect on private consumption, where the government replaces private sector expenses, or brings about an anticipation of future higher taxes to finance the current social transfers.

4.2. The Narrative Approach and CAPB

Following the discussion presented above, when considering the best approach to identify fiscal consolidation episodes, we repeat the baseline Fixed Effects estimation (Table 5), using the contractionary fiscal episodes identified in Devries et al. (2011) and Gupta (2017). Since the sample only covers 10 Euro Area countries (Belgium, Germany, Ireland, Spain, France, Italy, Netherlands, Austria, Portugal, and Finland) during the period of 1978-2015, we also re-estimated the baseline using the CAPB approach for this sub-sample, in order to provide a fair comparison (see Table 6).

According to Table 6, using the Narrative Approach to identify fiscal consolidations, both the short- and long-run elasticities of "Tax revenue" are statistically significant, as well as the short-run elasticities of "Other revenues", "Compensation to Employees", and "Other expenditure". During "normal times", not only does the short-run, but also the long-run elasticity of "Compensation to employees" becomes significant, as well as the short-run elasticity of "Investment".

The results also show that private consumption has a non-keynesian response to a "Tax revenue" shock (positive) - both in the short and long-run, i.e., an increase in the tax burden appears to stimulate private consumption. In addition, contrary to what occurs during fiscal consolidations, an increase in "Other expenditures" seems to have a recessive impact during normal times.

Table 6 – Comparison: the Narrative Approach and CAPB (10 Euro Area countries)

Fiscal Consolidations

			ΔPriv_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		0,164***	(3,279)	0,099	(1,022)
β_6	CE_{t-1}	x FE^C	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	

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

Long-Run Elasticities				
			Narrative Approach	**CAPB**
$-\beta_2/\lambda_1$	Tax	x FE^C	0,59	0,09
$-\beta_4/\lambda_1$	ORev		0,01	-0,05
$-\beta_6/\lambda_1$	CE		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	x $(1-FE^C)$	-0,09	0,17
$-\alpha_4/\lambda_1$	ORev		-0,08	-0,03
$-\alpha_6/\lambda_1$	CE		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

Compared to the CAPB-based results, we can see that, under austerity policies, with the exception of the "Investment" and "Other revenue" budgetary items, the statistically-significant variables have a non-keynesian behaviour. Whilst public "Investment" seems to lead to a crowding in effect of private consumption, an increase in "Social benefits" has a negative impact on private consumption.

Furthermore, it is relevant to highlight that when using both approaches (which gives robustness to Table 5's output), and independent of the existence of a fiscal episode, the "Tax revenue" budgetary item presents an expansionary impact, which could well be justified by the expectation of a future increase in Government expenditure.

4.3. Robustness

Since, in the context of the EMU, exchange rate policies are unavailable and the inflation rate has been undoubtedly low, we aim to assess whether fiscal elasticities changed after countries joined the Euro Area. Furthermore, as the business cycle is highly influenced by international factors (without strong barriers to capital, human, or capital circulation), we also take into account the role of economic (aggregate) growth in the EMU.

Accordingly, we divided the sample, using a dummy for the EMU that assumes the value of 1 for countries inside the Euro Area, and the 0 for countries not in the EMU. We also included the variable Y^{av}, which represents the natural logarithm of the (weighted) average of the EMU output per capita (after joining the Union) in order to control for the European business cycle, as was performed by Afonso and Martins (2016).

Table 7 reports these estimation results. We can observe that the so-called non-keynesian behaviour of both "Other expenditure" and "Investment" are no longer perceived after joining the EMU (which is probably related to a crowding out effect, were the reduction of expenditure leaves economic resources for the private sector, and diminishes the pressure on interest rates). Hence, after the EMU, it was harder to observe expansionary fiscal consolidations for these budgetary categories.

Table 7 –Fiscal consolidations (controlling EMU membership)

Fiscal Consolidations								
					$\Delta Priv\_C_t$			
			EMU (Y_t-Y^{av}_t)		**EMU**		**1-EMU**	
	C		0.062	(0.692)	**-0.021**	**(-0.163)**	-0.084**	(-2.137)
λ_1	$Priv\_C_{t-1}$		-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-1}		0.067**	(2.168)	**0.020**	**(0.646)**	-0.005	(-0.285)
λ_4	$\Delta(Y_t-Y^{av}_t)$		0.081	(1.061)				
λ_5	$Y_{t-1}-Y^{av}_{t-1}$		0.000	(0.026)				
β_1	ΔTax_t		0.164*	(1.912)	**0.183***	**(1.734)**	0.104	(1.056)
β_2	Tax_{t-1}		0.020	(0.755)	**0.050**	**(1.289)**	0.023	(0.705)
β_3	$\Delta ORev_t$		-0.023***	(-3.370)	**-0.071*** **	**(-2.743)**	-0.023	(-1.308)
β_4	$ORev_{t-1}$		-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-1}	x FE^C	0.005	(0.257)	**0.006**	**(0.224)**	0.048*	(1.852)
β_7	$\Delta GFKF_t$		0.045***	(2.704)	**0.047** **	**(2.451)**	-0.046*	(-1.755)
β_8	$GFKF_{t-1}$		0.011	(1.203)	**-0.000**	**(-0.032)**	-0.016	(-1.475)
β_9	$\Delta Social_t$		-0.195***	(-2.922)	**-0.146** **	**(-2.316)**	-0.195***	(-2.822)
β_{10}	$Social_{t-1}$		-0.004	(-1.068)	**-0.030**	**(-1.306)**	-0.004	(-0.256)
β_{11}	$\Delta OExp_t$		-0.069	(-0.605)	**0.015**	**(0.474)**	-0.069**	(-2.097)
β_{12}	$OExp_{t-1}$		-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-1}		0.049**	(2.313)	**0.064** **	**(2.268)**	0.039*	(1.956)
α_3	$\Delta ORev_t$		-0.010	(-0.447)	**-0.001**	**(-0.115)**	-0.010*	(-1.786)
α_4	$ORev_{t-1}$		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-1}	x $(1-FE^C)$	0.0020**	(-2.282)	**-0.044***	**(-1.865)**	0.002	(0.125)
α_7	$\Delta GFKF_t$		0.033***	(3.911)	**0.026*** **	**(2.669)**	0.009	(1.021)
α_8	$GFKF_{t-1}$		0.021***	(3.225)	**0.015***	**(1.862)**	-0.000	(-0.168)
α_9	$\Delta Social_t$		0.039	(1.564)	**0.093** **	**(2.203)**	0.016	(0.849)
α_{10}	$Social_{t-1}$		-0.011	(-0.738)	**-0.013**	**(-0.827)**	-0.011	(-1.360)
α_{11}	$\Delta OExp_t$		0.019*	(1.687)	**0.012**	**(0.894)**	0.034**	(2.530)
α_{12}	$OExp_{t-1}$		0.0035**	(-2.156)	**0.005**	**(0.313)**	0.003	(0.508)
	N		428		**280**		423	
	R^2		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 impacts are statistically significant at 1%, 5% and 10%, according to the classification ***, ** and * respectively (value of the t statistic in brackets).

Regarding "Social benefits", we find a negative elasticity both before and after the EMU, with a significate and expansionary (keynesian) impact during "normal times" in the EMU. In a last robustness estimation (Equation 7), we identified expansionary fiscal episodes as a way of assessing how fiscal consolidations are different from fiscal expansions, and also in order to achieve a more accurate "normal times" identification:

$$\begin{aligned}\Delta Priv\_C_{it} = {} & c_i + \lambda_1 Priv\_c_{it-1} + \lambda_2 \Delta Y_{it} + \lambda_3 Y_{t-1} \\ & + FE^C \text{ X } (\beta_1 \Delta Tax_{it} + \beta_2 Tax_{it-1} + \beta_3 \Delta ORev_{it} + \beta_4 ORev_{it-1} + \beta_5 \Delta CE_{it} \\ & + \beta_6 CE_{it-1} + \beta_7 \Delta GFKF_{it} + \beta_8 GFKF_{it-1} + \beta_9 \Delta Social_{it} + \beta_{10} Social_{it-1} \\ & + \beta_{11} \Delta OExp_{it} + \beta_{12} OExp_{it-1}) \\ & + FE^E \text{ X } (\alpha_1 \Delta Tax_{it} + \alpha_2 Tax_{it-1} + \alpha_3 \Delta ORev_{it} + \alpha_4 ORev_{it-1} + \alpha_5 \Delta CE_{it} \\ & + \alpha_6 CE_{it-1} + \alpha_7 \Delta GFKF_{it} + \alpha_8 GFKF_{it-1} + \alpha_9 \Delta Social_{it} + \alpha_{10} Social_{it-1} \\ & + \alpha_{11} \Delta OExp_{it} + \alpha_{12} OExp_{it-1}) \\ & + (1 - FE^C)(1 - FE^E) \text{ X } (\varphi_1 \Delta Tax_{it} + \varphi_2 Tax_{it-1} + \varphi_3 \Delta ORev_{it} + \varphi_4 ORev_{it-1} \\ & + \varphi_5 \Delta CE_{it} + \varphi_6 CE_{it-1} + \varphi_7 \Delta GFKF_{it} + \varphi_8 GFKF_{it-1} + \varphi_9 \Delta Social_{it} \\ & + \varphi_{10} Social_{it-1} + \varphi_{11} \Delta OExp_{it} + \varphi_{12} OExp_{it-1}). \qquad (7)\end{aligned}$$

In Table 8, we can observe that, in the case of fiscal expansions, "Taxes" and "Investment" are significantly expansionary, both in the short (0.14 and 0.03, respectively) and in the long run (0.74 and 0.23), and also that "Social benefits" have a negative long-run elasticity (-0.44). Once again, "Social benefits" show a negative elasticity (-0.15) in the context of fiscal consolidations.

By double-checking the Wald Test again, we find that: i) in the short run, "Other revenue" and "Social benefits" are more recessive during consolidations than during expansions, and that "Taxes" and "Compensation to employees" have a more expansionary effect. Furthermore, the "Other revenue", "Social benefits" and "Other expenditure" items are more recessive during fiscal consolidations than during "normal times" (which corroborates our first estimation results), and; ii) in the long run, "Investment" has a more recessive impact on private consumption during consolidations than during expansions, and "Social benefits" are more recessive in expansions than during "normal times".

Table 8 –Fiscal 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}	x FE^C	0.019	(1.213)
β_7	$\Delta GFKF_t$		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)
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

Fiscal Consolidations		
Long-Run Elasticities		
$-\beta_2/\lambda_1$	Tax	0,82
$-\beta_4/\lambda_1$	ORev	-0,09
$-\beta_6/\lambda_1$	CE	0,41
$-\beta_8/\lambda_1$	GFKF	-0,12
$-\beta_{10}/\lambda_1$	Social	-0,24
$-\beta_{12}/\lambda_1$	OExp	-0,28

Fiscal Expansions		
Long-Run Elasticities		
$-\beta_2/\lambda_1$	Tax	0,74
$-\beta_4/\lambda_1$	ORev	-0,03
$-\beta_6/\lambda_1$	CE	0,13
$-\beta_8/\lambda_1$	GFKF	0,23
$-\beta_{10}/\lambda_1$	Social	-0,44
$-\beta_{12}/\lambda_1$	OExp	0,01

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

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

Thus, according to the three sets of estimated specifications, we can argue that "Social benefits" could also be the source of long-term non-keynesian effects during fiscal expansions, albeit with a smaller magnitude than during consolidations.[4]

5. Conclusions

We studied the relevance of a series of fiscal instruments for the existence of varying fiscal elasticities, in other words, for the existence of possible non-keynesian effects, on private consumption during fiscal episodes. Accordingly, we estimated short- and long-run elasticities of private consumption to budgetary components, using dummy variables to identify fiscal episodes and also as a way of differentiating countries inside and outside the EMU. For the empirical analysis, we used a Fixed Effects model, covering 19 Euro Area countries during the period of 1960-2017.

The results show that the budgetary categories "Tax revenue", "Compensation to employees", "Investment", and "Other expenditure" all have a short-run expansionary effect during "normal times". On the other hand, in the context of fiscal consolidations, the "Other revenue" and "Social benefits" items have significant (negative) impacts. The positive "Tax revenue" elasticities indicate that consumers are Ricardian, in that they take into account in their decisions the likely increase in taxation as being a sign of future government spending.

In terms of estimated long-run elasticities, both "Taxes" and "Investment" have significant positive effects during so-called fiscal "normal times", while "Tax revenue" seems to have a statistically-significant elasticity when a fiscal consolidation occurs.

Using a narrative approach (instead of the traditional CAPB) to identify fiscal consolidations, private consumption continues to exhibit a non-keynesian response to tax increases, both in the short and long-run, and "other expenditures" seems to have a recessive impact during "normal times".

Furthermore, since the non-keynesian behaviour of both "Other expenditure" and "Investment" was no longer perceived after joining the EMU, we can argue that expansionary fiscal consolidations became more difficult to observe after the EMU.

Lastly, when comparing short-run elasticities during fiscal expansions, "normal times", and during fiscal contractions, both "Other revenue" and "Social benefits" are more recessive during consolidations than during expansions and "normal times". Furthermore, "Taxes" and

[4] Appendix 2 provides a summary of short-term elasticities for a better understanding and comparison of results.

"Compensation to employees" demonstrate more expansionary elasticities during fiscal consolidations than in the case of fiscal expansions.

Thus, according to our main results, the "Social benefits" budgetary component appears to contribute the most to the creation of a non-keynesian effect, and it is possible to conclude the existence of expansionary fiscal consolidations, with varying fiscal elasticities. Furthermore, "Social benefits" could well be a source of long-term negative responses of private consumption when fiscal expansions take place, albeit with a smaller magnitude than during fiscal consolidations.

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Appendix 1

Table A1 – Summary statistics, full panel, 1960-2017

STATISTICS	Mean	Median	Maximum	Minimum	Std. Dev.	Kurtosis	Observ.
Priv_C	57.84	57.39	81.43	30.43	7.89	4.21	915
Tax	34.71	34.67	48.00	12.24	7.28	2.90	760
ORev	4.49	4.51	44.46	0.55	2.14	3.26	760
CE	10.54	10.55	16.68	5.12	2.00	2.74	760
GFKF	3.43	3.48	6.32	1.24	1.00	2.52	765
Social	14.11	14.06	26.40	2.49	4.43	2.94	760
OExp	13.88	13.77	36.00	3.02	4.58	3.13	760
Population	16238.9	5368.5	82659.0	306.3	22960.8	4.26	1102
Real GDP (=2010)	388.8	147.1	2918.8	3.5	589.2	7.09	855

Source: AMECO

Note: Both fiscal instruments and private consumption are presented as percentage of GDP, population is presented in thousands of people, and real GDP in billion euros (2010 prices).

Appendix 2

Table A2 - 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.

Appendix 3 – Case study: Portugal

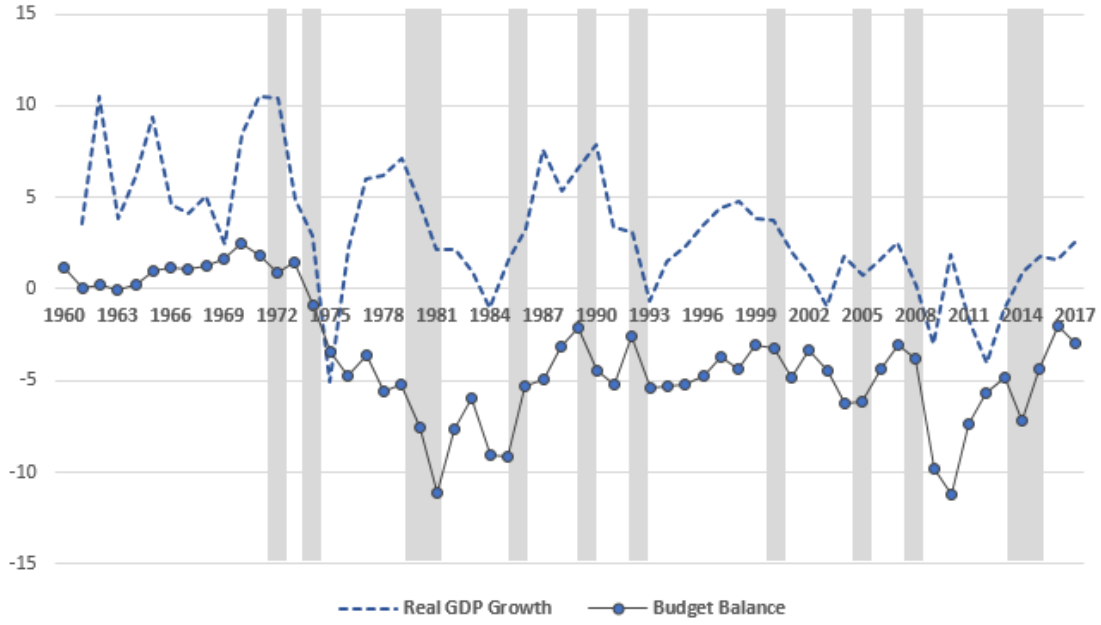
In Table A3 and in Figure A, as an illustration, we summarise the several fiscal episodes that occurred in the case of Portugal. The following analysis focuses more on the 1980s, namely during the period of external intervention, which is referred to in the literature as being an example of a non-keynesian period.

Table A3 – 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		

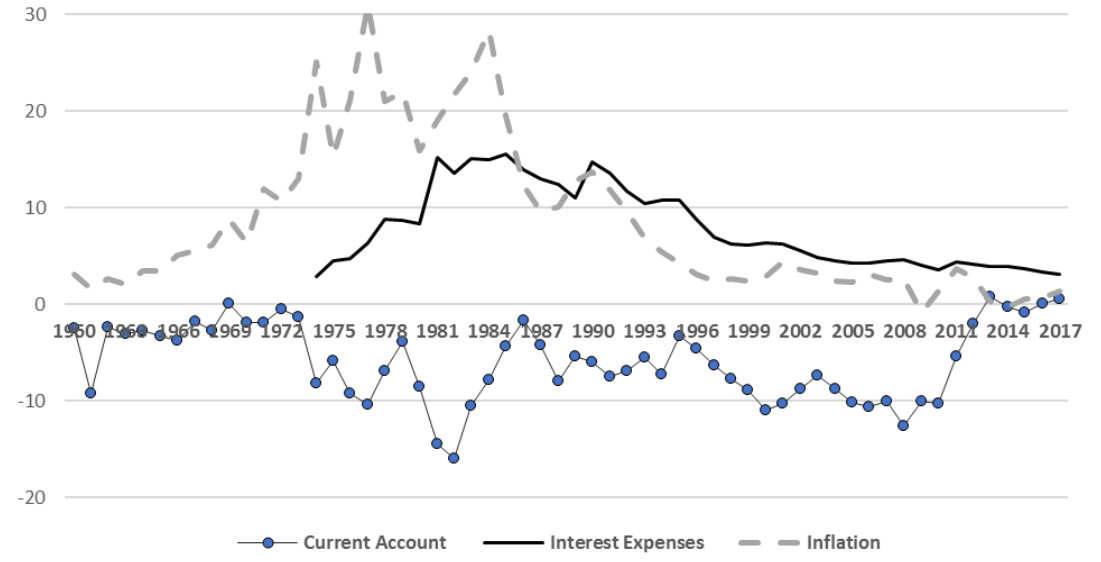
Source: Authors' calculations.
Note: E – Fiscal Expansions; C – Consolidations; RE – Recessive Expansions; EC – Expansionary Consolidations
NKE are episodes where: i) the average real GDP growth during the two years after the fiscal contraction is greater than the growth during the two years before,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

Figure A: Real GDP growth and budget balance (left axis, % GDP) and unemployment rate (right axis) (1960-2017)



During the early 1980's, Portugal faced persistent high budget deficits (attaining values above 11 p.p. of GDP), which were not fully offset by the impact on economic growth, which revealed weak growth rates in real terms (which were boosted by the application of monetary measures). This seems to have led to an increase of the debt ratio from year to year, accompanied by both a rise in inflation and difficulties in sovereign financing (see Figure B).

Figure B: Current account, interest expenses (% GDP), and inflation rate (CPI) (1960-2017)



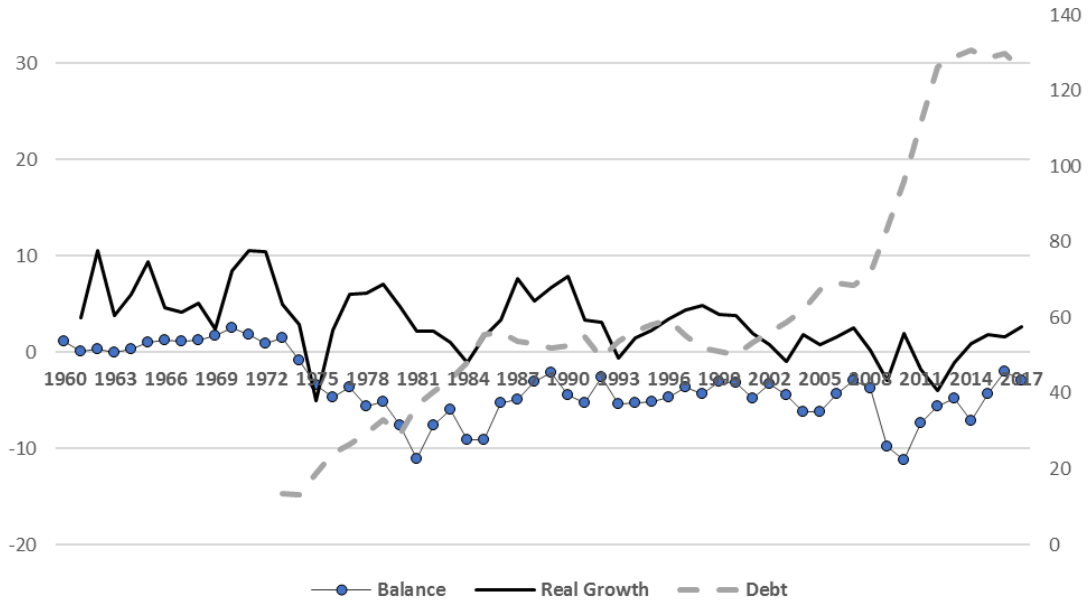
Source: AMECO and OECD.

In this framework, and following the 1979 oil shock, Portugal was forced to apply a more restrictive fiscal policy and had to request external interventional, signing the second Stability Programme with the IMF, in order to control the public accounts, reduce inflation, and correct the current account imbalances. Later, in 1986, after the introduction of VAT (Value Added Tax) and a tax on petroleum products, a strong increase in tax revenue was observed.

The resulting of the joint impact of this fiscal consolidation and Portugal's accession to the EEC (European Economic Community), strong economic growth was experienced in January 1986, which was simultaneous with a budget deficit decrease (from 9.2% of GDP in 1985, to 2.1% in 1989) and also a reduction in the debt-to-GDP ratio of 3.8 p.p.. Alesina and Perotti (1995) called this a "stop and go" episode (Figure C).

Thus, with favourable stock-flow adjustments arising from the privatisation programme, the correction of external imbalances, reductions in the sovereign interest rate, an increase in competitiveness, and also a currency devaluation, Portugal appeared to have achieved an economic recovery. However, in spite of the reduction in public expenditure, the compensation of employees in the public sector presented an increasing trend (Afonso, 2001). As a result, since the fiscal consolidation, Portugal experienced a reduction in unemployment (Figure D), an increase in private demand (both in private consumption and in investment), and an increase in the potential output growth rate.

Figure C: Balance, real GDP growth (left axis), and gross public debt (right axis) (% GDP, 1960-2017)

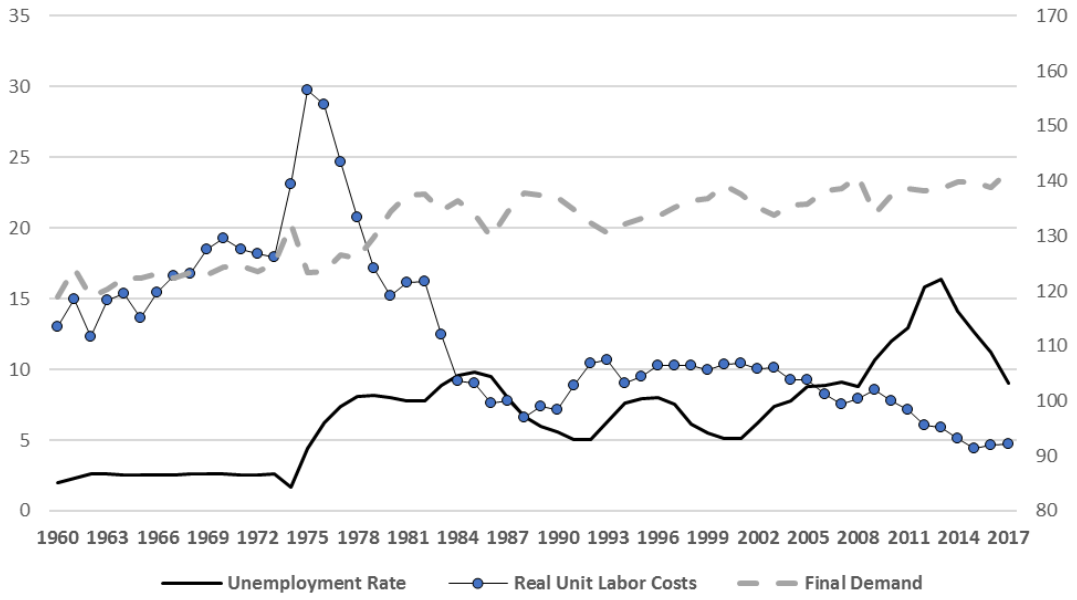


Source: AMECO.

The 1986 expansionary consolidation is often referred to in the literature as being an example of a non-keynesian episode.

Lastly, the recent years of 2015-2016 could, in effect, be new examples of expansionist consolidations, where, benefiting from expansionary monetary policies and a positive international conjuncture, Portugal recorded robust economic growth and a strong decrease in the unemployment rate.

Figure D: Unemployment rate (left axis) real ULC[5] and Final Demand (% GDP) (right axis) (1960-2017)



Source: AMECO.

[5] Ratio of compensation per employee to nominal GDP per person employed.

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