PUBLIC EXPENDITURE IN TIME OF CRISIS: ARE ITALIAN

POLICYMAKERS CHOOSING THE RIGHT MIX?

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Public expenditure in time of crisis: are Italian policymakers choosing the right mix?

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A B S T R A C T

In the "austerity debate" a crucial issue is the composition of fiscal adjustment. This article provides empirical evidence on the relationship between economic crisis episodes and composition of public expenditure by examining the impact of economic crises on the share of different types of public spending in total public expenditure in the Italian regions. Our results suggest that fiscal consolidation strategies have not had growth-friendly composition.

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1. Introduction

The financial crisis of 2008-2009 and the consequent economic downturn have had a huge impact on public finances in all European Union Member States over the last few years. This situation has led European countries to introduce sizeable fiscal consolidation measures. The results of this choice has been perverse: expenditure cuts have happened mainly at the cost of public investments, the expenditure category expected to be growth-enhancing, exactly the opposite of what the current economic situation of many European countries would have called for.[1] In the "austerity debate" a crucial issue is, therefore, the composition of fiscal adjustment.

Since large part of the burden of adjustment has been assumed by the sub-national governments and most European countries have undertaken fiscal decentralization reforms since the mid-1990s, assigning more expenditure functions to lower levels of governments (Sacchi, Salotti 2016), it is interesting to analyse, in particular, whether there is a statistical relationship between economic crises and changes in regional government expenditure composition.[2] The share of subnational spending in total expenditures has reached more than 30% in all federal states and in some non-federal states, too (European Commission 2013)

This paper adds to the (scarce) empirical evidence on the relationship between economic crisis episodes and composition of public expenditure by examining the impact of economic crises on the share of different types of public spending in total public expenditure

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[1] Barbiero and Darvas (2014) argue that since the fiscal multiplier of public investment is the largest among the main expenditure and revenue categories of the government, the significant cut-backs in public investment exaggerated the output fall.

[2] Grisorio and Prota (2015a, 2015b) analyse the relationship between fiscal decentralization and public expenditure composition in Italy.

of the Italian regional administrations as well as of central government over the period 1996-2012.

Within this framework, the analysis of the Italian case is of relevance for a number of reasons. First, Italy has faced its worst recession in recent history (Accetturo et al. 2013). Italy has been interested by two waves of the crisis: the first wave hit in 2008, causing a sharp fall in GDP in 2009; then, after a small recover in 2010, the Italian GDP collapsed again in 2011-2013 causing an impressive "double dip" in economic activities. Second, the cumulative effect of financial measures adopted during the crisis has been above 120 euro billions, namely almost 8% of the GDP. Necessarily, this massive program had to affect local governments, as in Italy regions and lower levels of government control large part of public expenditure (Ambrosanio et al. 2016). Third, Italy is a country marked by severe structural and economic contrasts across different areas. Fiscal consolidation policies have been harsher in less developed regions, so increasing internal disparities: tax increases and expenditure cuts were both, simultaneously, stronger in the Italian Mezzogiorno than in the rest of the country, inducing a worse performance of this area in terms of GDP per capita and employment (Prota, Viesti 2015).

The remainder of the paper is organized as follows. In section 2 we present the data and the methodology applied. The third section presents the econometric analysis and discusses the main results. Finally, the fourth section concludes.

2. Empirical specification and data

The focus of this study is the relationship between economic crisis and changes in public expenditure composition at regional level. Thus, we specify and estimate a set of models where our dependent variable represents the capital expenditure, expressed, respectively, as a share of total public expenditure of the regional administration (*Cap_exp*)

and of central government (*CG_Cap_exp*), and selected expenditure functional categories (*Exp_func_cat*) expressed as a share of total public expenditure of the regional administration. We analyse those categories often highlighted as needing prioritisation and strengthening in public budget in order to tackling the legacies of the crisis, which go well beyond the short term.[3]

$$Cap\_exp_{r,t} = \alpha_r + \beta_1 Crisis_{r,t-1} + \beta_2 Election_{r,t} + \beta_3 Pre\text{-}election_{r,t} + \beta_4 X_{r,t-1}$$
$$+ \beta_5 Crisis*SSR_{r,t-1} + \varepsilon_{r,t} \tag{1}$$

$$CG\_Cap\_exp_{r,t} = \alpha_r + \beta_1 Crisis_{r,t-1} + \beta_2 Election_{r,t} + \beta_3 Pre\text{-}election_{r,t} + \beta_4 X_{r,t-1} + \varepsilon_{r,t} \tag{2}$$

$$Exp\_func\_cat_{r,t} = \alpha_r + \beta_1 Crisis_{r,t-1} + \beta_2 Election_{r,t} + \beta_3 Pre\text{-}election_{r,t} + \beta_4 X_{r,t-1}$$
$$+ \beta_5 Crisis*SSR_{r,t-1} + \varepsilon_{r,t} \tag{3}$$

The regressor of interest is the dummy variable *Crisis* that is equal to one for any year where real GDP growth is negative and zero otherwise.

Since in advanced economies, the electoral cycle can emerge much more in the budget composition than in the overall levels of public expenditure and tax revenue, we introduce two dummy variables, *Election* and *Pre-election*, which assume value 1 in the year of election and pre-election of the regional council and zero otherwise.[4]

Finally, the vector *X* includes control variables, based on standard models of demand for government expenditure, which seek to capture factors affecting public expenditure

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[3] The functional breakdown of public expenditure is presented in Table A.1 in Appendix A.

[4] Rogoff (1990) was the first to provide a theoretical foundation for the possibility of electorally timed shifts in the composition rather than the level of public spending.

composition: income; demographics (population density and age distribution); partisanship of the government.[5] Moreover, in Equations (1) and (3) an interaction term between the variable *Crisis* and a dummy variable capturing the Special Statute Regions status is included (*Crisis*SSR*).[6]

Considered that the dependent variable is a fraction constrained in the interval [0, 1], we estimate a fractional response model for panel data by pooled QMLE (Papke and Wooldridge 2008). In order to facilitate the interpretation of our estimates, we calculate the average partial effects (APE), which result from averaging the unobserved heterogeneity across regions (Wooldridge 2005). In other words, we compute the average of all individual partial effects across time in our sample.

The data on public expenditure are taken from the Territorial Public Accounts (*Conti pubblici territoriali*) produced by the Italian Ministry of Economy. These data provide the allocation of revenues and expenditure flows collected/paid by each level of government included in the general government among 20 Italian Regions for the period 1996–2012. The Territorial Public Accounts allow for the analysis of various sub-aggregates covering different macro-areas and administrative regions, sector classifications, economic categories, definitions of government expenditure and final expenditure recipients.

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[5] Table A.2 in Appendix A shows the descriptive statistics and sources of the variables used in the econometric analysis.

[6] Italian regions are divided in two groups: 15 ordinary statute regions (OSRs) and five special statute regions (SSRs). Geographical, cultural and economic reasons led to the establishment, recognized at the constitutional level, of autonomous regions with special statutes. The SSRs have broader competencies and spending powers than the OSRs and enjoy a correspondingly larger tax autonomy.

3. Empirical results

Table 1 reports fractional probit-pooled QMLE estimations of Equation (1).[7] The dummy variable *Crisis* is negative and statistically significant showing that economic recessions influence public investment choice of regional governments towards current expenditure. In order to facilitate the interpretation of our estimates, we calculate the average partial effects: our estimates show that the presence of a recession year reduces the share of capital expenditure by 4% in the subsequent year. Interestingly, the effect of a crisis is different for the subsample of Special Statute Regions: the sum of the coefficients of the interaction term (*Crisis*SSR$_{t-1}$*) and the dummy variable *Crisis* is positive meaning that there is an increase in the share of capital expenditure.

Regarding the regional electoral cycle, we find that both the pre-electoral and electoral years are associated to an increase of the share of capital expenditure, confirming the theoretical predictions regarding the nature of the electorally induced distortions of expenditures, and indicating capital expenditure as the most visible item of spending.

Looking at other control variables, it would be expected that poorer regions invest a higher share on capital in order to catch up the richer regions; nevertheless, it is found that the coefficient on *Gdp_pc$_{t-1}$* has a positive sign even if the magnitude of the effect is small. Insofar as demographic variables are concerned, population density (*Pop_den$_{t-1}$*) seems to confirm the possibility of taking advantage of economies of scale when providing public services.

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[7] As a robustness test, Equation (1) is estimated using another estimation technique: fractional logit. The robustness analysis confirms the hypothesis that recessions influence public investment choice of regional governments towards current expenditure.

We find that a recession year reduces the share of capital expenditure in the subsequent year, even when we examine the expenditure decisions of the central government (Table 2).

Our results, therefore, are in line with the idea that Europe during the recent financial and economic crises saw drastic cuts in public investment in vulnerable Member States.[8]

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[8] Figures B.1 and B.2 in Appendix B clearly show that capital expenditure of both central and regional governments has been characterised by a downward trend in the period 1996-2012.

Table 1

The effect of crisis on the capital expenditure of the regional administrations in the Italian regions

Dependent variable: ratio of capital expenditure to total public regional expenditure (number of observations = 336)

	(1) Fractional probit-pooled QMLE		(2) Fractional logit	
	Coefficient	APE	Coefficient	Marginal effect
Crisis$_{t-1}$	-0.193***	-0.042***	-0.371***	-0.043***
	(0.056)	(0.011)	(0.067)	(0.007)
Crisis*SSR$_{t-1}$	0.401***	0.107***	0.710***	0.106***
	(0.077)	(0.023)	(0.100)	(0.018)
GDP_pc$_{t-1}$	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Pop_den$_{t-1}$	-0.002***	-0.000***	-0.004***	-0.000***
	(0.001)	(0.000)	(0.000)	(0.000)
Pop_15$_{t-1}$	0.787	0.180	1.124	0.137
	(2.404)	(0.517)	(2.034)	(0.248)
Pop_65$_{t-1}$	-4.033**	-0.921**	-7.297***	-0.891***
	(2.033)	(0.432)	(1.540)	(0.188)
Left_gov$_t$	0.077	0.017	0.130**	0.016**
	(0.052)	(0.012)	(0.051)	(0.006)
Pre-electoral_year$_t$	0.082***	0.019***	0.142**	0.018**
	(0.028)	(0.006)	(0.060)	(0.008)
Electoral_year$_t$	0.066***	0.015***	0.113*	0.014*
	(0.023)	(0.005)	(0.062)	(0.008)
Cg_Cap_exp$_{t-1}$	1.368	0.313	2.423***	0.296***
	(1.191)	(0.256)	(0.726)	(0.089)
Constant	-0.610		-0.849	
	(0.609)		(0.579)	
Pseudo-log-likelihood	-98.367		-138.537	

Notes: * significant at 10%, ** significant at 5% and *** significant at 1%. Robust standard errors in parentheses.

APE, average partial effects; QMLE, quasi-maximum likelihood estimation.

Table 2

The effect of crisis on the capital expenditure of the central government in the Italian regions

Dependent variable: ratio of capital expenditure to total central government expenditure (number of observations = 357)

| | (1) | | (2) | |
| | Fractional probit-pooled QMLE | | Fractional probit-pooled QMLE | |
	Coefficient	APE	Coefficient	APE
Crisis$_{t-1}$	-0.031*	-0.006*	-0.031*	-0.006*
	(0.017)	(0.003)	(0.017)	(0.003)
Pseudo-log-likelihood	-91.366		-91.370	

Notes: For the sake of clarity and in order to keep the table manageable, we do not report control variables.

* significant at 10%, ** significant at 5% and *** significant at 1%. Robust standard errors in parentheses.

The last step of the analysis concerns specific expenditure categories of the Italian regional administrations: 'Social welfare', 'Investment in human capital', and 'Production activities'. The results showed in Table 3 indicate that for all these expenditure categories there is a reduction of their share on the total expenditure: from 1.3%, for investment in human capital, to 2.0%, for productive activities support. These findings are interesting since they show that after a recession year regional administrations tend to reduce growth-enhancing categories of public expenditure such as investments in human capital and in productive activities support.[9]

It is worth noting that SSRs continue to show different behaviour from the other Italian regions in terms of public expenditure decisions in the years following a crisis.

As regards the effects of regional electoral cycle, the variable *Pre-electoral_year$_t$* is associated to an increase of the share of social expenditure and production activities support. On the contrary, investment in human capital has not be affected by elections.

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[9] As a robustness test, Equation (3) is estimated using fractional logit, too (Table C.1 in Appendix C).

Table 3

The effect of crisis on the functional composition of public expenditure of the regional administrations in the Italian regions

Dependent variable: ratio of expenditure for a specific functional category to total public regional expenditure (number of observations = 336)

Method of estimation: fractional probit-pooled quasi-maximum likelihood estimation (QMLE)

	(1) Social welfare		(2) Investment in human capital		(3) Production activities	
	Coefficient	APE	Coefficient	APE	Coefficient	APE
$Crisis_{t-1}$	-0.248***	-0.014***	-0.141***	-0.013***	-0.175***	-0.020***
	(0.080)	(0.004)	(0.052)	(0.004)	(0.049)	(0.005)
$Crisis*SSR_{t-1}$	0.363***	0.028**	0.176*	0.019*	0.341***	0.050***
	(0.109)	(0.013)	(0.094)	(0.011)	(0.079)	(0.014)
Pop_den_{t-1}	-0.002***	-0.000***	-0.002***	-0.000***	-0.003***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP_pc_{t-1}	0.000***	0.000***	0.000	0.000*	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pop_65_{t-1}	-5.516**	-0.334***	-4.691***	-0.449***	-5.321***	-0.640***
	(2.147)	(0.116)	(1.363)	(0.111)	(1.437)	(0.162)
Pop_15_{t-1}	0.430	0.026	5.805***	0.556**	-3.529*	-0.424*
	(3.609)	(0.206)	(2.242)	(0.219)	(2.108)	(0.245)
$Left\_gov_t$	0.009	0.001	0.041	0.004	-0.025	-0.003
	(0.076)	(0.004)	(0.051)	(0.005)	(0.043)	(0.005)
$Pre\text{-}electoral\_year_t$	0.076**	0.005**	0.024	0.002	0.064*	0.008*
	(0.034)	(0.002)	(0.027)	(0.003)	(0.037)	(0.005)
$Electoral\_year_t$	0.006	0.000	0.006	0.001	0.051	0.006
	(0.021)	(0.001)	(0.025)	(0.002)	(0.036)	(0.004)
$CG\_Social\_welfare_{t-1}$	-0.657	-0.040				
	(0.449)	(0.028)				
$CG\_Inv\_hc_{t-1}$			-6.084***	-0.583***		
			(0.995)	(0.097)		
$CG\_Prod\_activities_{t-1}$					1.288***	0.155***

			(0.429)　(0.049)
Constant	-0.922	-1.026**	0.242
	(0.764)	(0.431)	(0.484)
Pseudo-log-likelihood	-31.357	-46.012	-56.940

Notes: * significant at 10%, ** significant at 5% and *** significant at 1%. Robust standard errors in parentheses.

APE, average partial effects.

4. Conclusions

This paper analyses whether there is a relationship between economic crisis episodes and composition of public expenditure. Our results clearly demonstrate that economic recessions influence public investment choice. First, the presence of a recession year reduces the share of capital expenditure in the subsequent year of both regional and central government. Second, looking at a functional classification of expenditures, the variable *Crisis* is associated to a reduction of the share of the following categories: 'Social welfare', 'Investment in human capital', and 'Production activities'.

The policy implications of our findings may be quite interesting. Austerity programmes should minimise the potentially negative short-term effect on economic activity, while establishing a foundation for long-term growth, with growth-enhancing expenditure safeguarded from cuts, or even increased. Conventional wisdom proposes that capital expenditures will have a positive effect on growth; besides, the areas often highlighted as needing protection in the context of shrinking overall budgets include infrastructure, education and R&D.

In the case of Italy, what has happened is the opposite. Thus, fiscal consolidation strategies did not seem to have growth-friendly composition while likely have exaggerated the output contractions.

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Table A.1

Functional breakdown of public expenditure

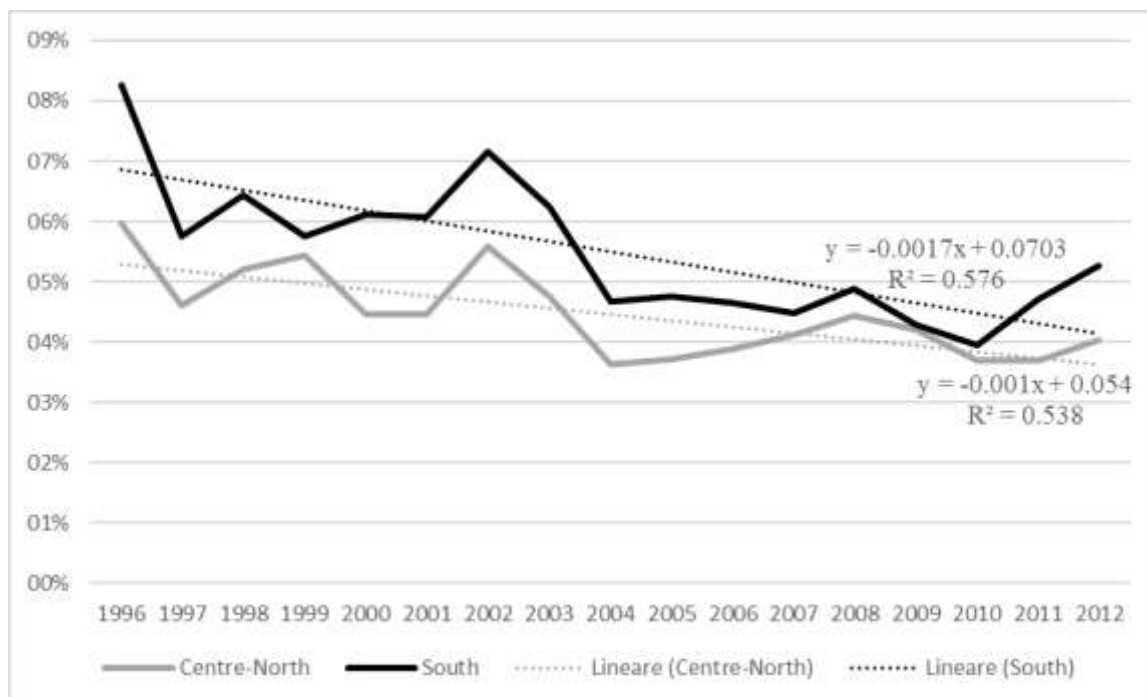| Aggregation	Territorial public accounts sectors
Pure public goods	General administration
	Defence
	Public Order
	Justice
Social welfare	Pensions and wage supplementation
	Labour
	Social affairs (assistance and charity)
	Residential building and urban development
Public investment to enhance human capital	Training
	Education
	Culture and recreational services
Infrastructure	Roads
	Other transport
	Telecommunications
	Energy
	Water
	Sewers and water treatment
	Environment
	Waste disposal
	Other public works
Expenditure for productive activities support	Agriculture
	Marine fishing and aquaculture
	Tourism
	Wholesale and retail distribution
	Industry and artisan
	Other economic sectors
Health	Health
Research and development	Research and development

Table A.2

Variable descriptions and summary statistics

Variable	Description	Obs	Mean	Std. Dev.	Min	Max	Source
Cap_exp_{t-1}	Ratio of capital to total public expenditures of the regional government	357	0.15827	0.09884	0.02482	0.58492	Territorial public accounts (*Conti pubblici territoriali*)
$Cg\_Cap\_exp_{t-1}$	Ratio of capital to total public expenditures of the central government	357	0.11581	0.04346	0.04903	0.25049	Territorial public accounts (*Conti pubblici territoriali*)
Pub_goods_{t-1}	Ratio of public goods expenditure to total public expenditures of the regional government	357	0.06767	0.03978	0.01581	0.20273	Territorial public accounts (*Conti pubblici territoriali*)
$Social\_welfare_{t-1}$	Ratio of social welfare to total public expenditures of the regional government	357	0.02833	0.03347	0.00183	0.21310	Territorial public accounts (*Conti pubblici territoriali*)
Inv_hc_{t-1}	Ratio of investment to enhance human capital to total public expenditures of the regional government	357	0.70758	0.14081	0.23656	0.91712	Territorial public accounts (*Conti pubblici territoriali*)
$Infrastructure_{t-1}$	Ratio of infrastructure to total public expenditures of the regional government	357	0.09416	0.03891	0.01104	0.24650	Territorial public accounts (*Conti pubblici territoriali*)
$Prod\_activities_{t-1}$	Ratio of expenditure for productive activities support to total public expenditures of the regional government	357	0.06612	0.05368	0.00802	0.42581	Territorial public accounts (*Conti pubblici territoriali*)

R&D$_{t-1}$	Ratio of R&D expenditure to total public expenditures of the regional government	357	0.00243	0.00530	0.00000	0.03242	Territorial public accounts (*Conti pubblici territoriali*)
Health$_{t-1}$	Ratio of health expenditure to total public expenditures of the regional government	357	0.68886	0.17845	0.18008	0.90680	Territorial public accounts (*Conti pubblici territoriali*)
Crisis$_{t-1}$	Dummy variable equal to 1 if the percentage change in the level of real GDP is negative, 0 otherwise	357	0.27171	0.44546	0	1	Italian Institute of Statistics (ISTAT)
CG_Social_welfare$_{t-1}$	Ratio of social welfare expenditures of the central government in each region	357	0.58490	0.07250	0.04732	0.72942	Territorial public accounts (*Conti pubblici territoriali*)
CG_Inv_hc$_{t-1}$	Ratio of investment to enhance human capital of the central government in each region	357	0.08394	0.03768	0.00651	0.16298	Territorial public accounts (*Conti pubblici territoriali*)
CG_Prod_activities$_{t-1}$	Ratio of expenditure for productive activities support of the central government in each region	357	0.04172	0.03983	0.00287	0.17641	Territorial public accounts (*Conti pubblici territoriali*)
Left_gov$_t$	Dummy variable equal to 1 if the government is left-winged, 0 otherwise	357	0.58824	0.49284	0	1	Ministero dell'Interno
Electoral_year$_t$	Dummy variable equal to 1 if regional government is in election year, 0 otherwise	357	0.18487	0.38874	0	1	Ministero dell'Interno
Pre-electoral_year$_t$	Dummy variable equal to 1 if regional government is in pre-election year, 0 otherwise	357	0.204	0.404	0	1	Ministero dell'Interno
GDP_pc$_{t-1}$	GDP per capita (euro)	357	22380.39	6378.56	9946.60	36603.70	Italian Institute of Statistics (ISTAT)

|							
Pop_den$_{t-1}$	Persons per km^2	357	172.80510	106.08490	35.82077	429.48470	Italian Institute of Statistics (ISTAT)
Pop_15$_{t-1}$	Population below 15 years / totale population	357	0.14055	0.02112	0.10105	0.19978	Italian Institute of Statistics (ISTAT)
Pop_65$_{t-1}$	Population 65 years and over / totale population	357	0.19513	0.02985	0.12400	0.27200	Italian Institute of Statistics (ISTAT)

Figure B.1 - Capital expenditure of the Italian Central government, % of GDP, 1996-

2012

Source: authors' elaboration on Territorial public accounts (*Conti pubblici territoriali*)

Figure B.2 - Capital expenditure of the Italian Regional administrations, % of GDP, 1996-2012
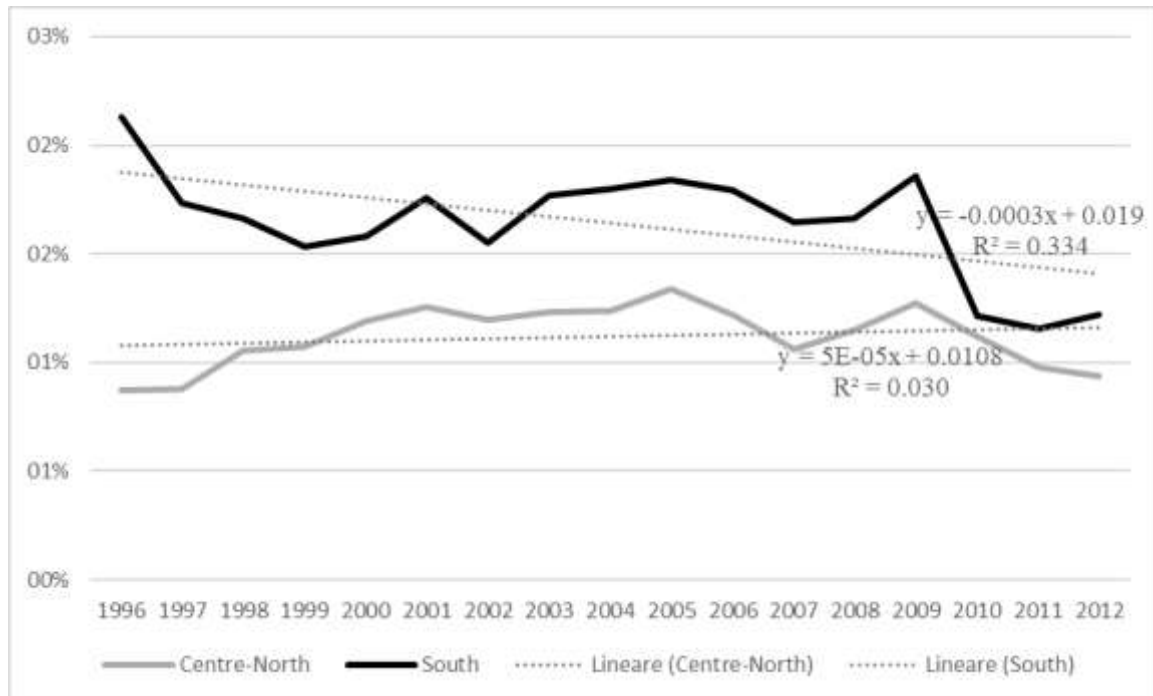
Source: authors' elaboration on Territorial public accounts (*Conti pubblici territoriali*)

Table C.1

The effect of crisis on the functional composition of public expenditure of the regional administrations in the Italian regions

Dependent variable: ratio of expenditure for a specific functional category to total public regional expenditure (number of observations = 357)

Method of estimation: fractional logit

	(1)	(2)	(3)
	Social_welfare	Prod_activities	Inv_hc
Crisis_{t-1}	-0.534***	-0.198**	-0.223**
	(0.099)	(0.097)	(0.097)
Crisis*SSR_{t-1}	0.534**	0.225	0.180
	(0.209)	(0.139)	(0.151)
Pop_den_{t-1}	-0.002***	-0.003***	-0.002***
	(0.001)	(0.000)	(0.000)
GDP_pc_{t-1}	0.000***	-0.000	0.000***
	(0.000)	(0.000)	(0.000)
Pop_65_{t-1}	-15.681***	-11.102***	-15.606***
	(3.215)	(2.133)	(2.557)
Pop_15_{t-1}	-6.569	-10.788***	-1.630
	(4.472)	(2.437)	(2.854)
Left_gov_t	0.009	-0.069	0.168**
	(0.107)	(0.067)	(0.077)
$\text{Pre-electoral\_year}_t$	0.088	-0.001	-0.061
	(0.143)	(0.079)	(0.096)
Electoral_year_t	-0.039	0.073	-0.054
	(0.137)	(0.078)	(0.087)
Constant	2.126*	4.167***	1.627**
	(1.189)	(0.675)	(0.819)
Pseudo-log-likelihood	-373.854		

Notes: * significant at 10%, ** significant at 5% and *** significant at 1%. Robust standard errors in parentheses.