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Fiscal Decentralization and Public Spending: Evidence from Heteroscedasticity-Based Identification

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Abstract:

We analyse the instantaneous relation between public spending and expenditure decentralization by means of a novel identification scheme suggested in Lewbel (2012). Our cointegration, error-correction approach indicates that expenditure decentralization impacts negatively on total public spending and most of its subcategories.

Keywords: Fiscal decentralization, public spending, government ideology, endogeneity, heteroscedasticity-based identification

JEL classification: H41, H50, H72, H77

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Highlights:

- We address endogeneity among public spending and expenditure decentralization.
- We employ error-correction models and a new approach proposed by Lewbel (2012).
- We find that expenditure decentralization mutes the growth of total public spending.

1 Introduction

While establishing modern welfare states has been seen as positive for economic development, many economists have started to ask whether, nowadays, the public sector in many developed economies is oversized. Accordingly, recent tendencies of expenditure decentralization are seen critically, as it is commonly expected that decentralization contributes to an increase of public spending (e.g. Rodden 2003).

Economic theory currently agrees that some government functions are better centrally provided, e.g. because of economies of scale, while decentralizing others might better match the citizens' preferences (Tiebout 1956; Oates 2005). For most functions, however, the appropriateness of centralized versus decentralized provision depends on the tradeoffs between economies of scale or coordination advantages, and information or accountability disadvantages of central provision (Oates 1985; Seabright 1996). Against this background, the effects of increasingly decentralized service provision on public expenditure are, lastly, a matter of empirical analysis. Apart from measurement issues, intrinsic endogeneity linking decentralization and public expenditure complicates the assessment of causal effects. Thus, the degree of decentralization might directly depend on public sector size or might be influenced by ongoing processes of globalization, democratization or economic growth that also determine public sector size. Until now the literature has tried to resolve the endogeneity problem by finding valid instrument variables. However due to the scarcity of time-variant exogenous instruments this problem has not yet been convincingly resolved (Martinez-Vasquez, Logo-Peñas, and Sacchi 2015). To handle the endogeneity problem, we employ a new approach proposed by Lewbel (2012) and analyse the influence of expenditure decentralization on total public spending and six of its main subcategories.

Furthermore, we address the endogeneity of government ideology which is often seen as an important determinant of public expenditure and decentralization (Baskaran 2011).¹ Reverse causality between government ideology and public spending arises because electors' votes depend on governments' previous spending policies. For example, the significant impact of election periods on government spending can be seen as an indicator of the influence of government spending on the re-election probability (see e.g. Herwartz and Theilen 2017). Again, resolving this endogeneity problem has not been possible due to the lack of valid instrument variables.² The suggestion of Lewbel (2012) allows to solve this endogeneity problem by means of instruments that take advantage of the heteroscedasticity of model disturbances. Finally, taking account of the non-stationarity of our data, we use error-correction models (ECMs) to distinguish between long-run and short-run determinants of public expenditure.

2 Data and Empirical Model

2.1 Data and Variables

The data set comprises annual data from 1995 to 2013 for 23 OECD economies: Austria (AUT), Belgium (BEL), Czech Republic (CZR), Denmark (DNK), Estonia (EST), Finland (FIN), France (FRA), Germany (GER), Hungary (HUN), Ireland (IRL), Italy (ITA), Japan (JPN), Latvia (LAT), Luxembourg (LUX), the Netherlands (NLD), Norway (NOR), Portugal (PRT), Slovak Republic (SLR), Slovenia (SLO), Spain (ESP), Sweden (SWE), the United Kingdom (UK), and the United States (US).³ Our dependent variable is public expenditure on spending category c , $pe^{(c)}$, measured as per capita expenditure in logarithms of quotes in US dollar and US purchasing power parity implied prices with 2010 as the base year. As spending categories we distinguish: general public services ($c = 1$), public order and safety ($c = 2$), economic affairs ($c = 3$), health ($c = 4$), education ($c = 5$), social protection ($c = 6$).⁴ We also consider "non-social" spending ($c = non-social$) which comprises the first three categories, and "social" spending ($c = social$) which includes the last three categories. Finally, total public expenditure is $pe^{(total)} = pe^{(non-social)} + pe^{(social)}$.

Public expenditure is explained by the following economic explanatory variables: a decentralization index for each spending category ($dec^{(c)}$) indicating the share of subnational spending (local and state), per capita gross domestic product in logarithms (gdp), population ageing ratios ($p15$, $p65$), the unemployment rate (ue), and, as shares of GDP, the volume of trade ($trade$), the current account balance (nx), general government surplus ($surp$), and general government debt ($debt$).

As political explanatory variables we use government ideology ($ideo$) as the unweighted mean of the ideological position of parties in government on a -5 (leftist) to 5 (rightist) scale, the number of coalition partners in government (nep), a dummy variable for election years ($elec$), and an indicator for the polarization of the party system ($pola$) as proposed by Esteban and Ray (1994). The election variable is determined as in Franzese (2000) as

$$elec = \frac{(M - 1) + d/D}{12}, \quad (1)$$

where M is the month and d is the day of election, and D is the number of days in the month of election. In years without elections $ELEC = 0$. Following Esteban and Ray (1994), the polarization of the party system is measured as

$$pola = \sum_{j=1}^J \sum_{l=1}^J v_j^2 v_l |ideo_j - ideo_l|, \quad (2)$$

where J is the number of parties, and v_j and v_l are the shares of seats in parliament of parties j and l , respectively. Table 1 provides an overview of variable definitions, measurement, and data sources. Table 2 documents the descriptive statistics.

Table 1: Data definitions and sources.

Variable	Definition	Measurement	Source
$pe^{(c)}$	Public expenditure on spending category c	Per capita in US dollar and US purchasing power parity in natural logarithms	OECD (2016a)

$dec^{(c)}$	Decentralization indicator for spending category c	Share of subnational public expenditure on category c over total expenditure.	Own calculations with data from OECD (2016a)
gdp	Gross Domestic Product	Per capita in US dollar and US purchasing power parity in natural logarithms	OECD (2015)
ue	Unemployment rate	Share of unemployed over total labour force	OECD (2015)
$p15$	Young population rate	Ratio of young (< 15) over total population	OECD (2015)
$p65$	Elderly population rate	Ratio of elderly (> 65) over total population	OECD (2015)
nx	Current account balance (net exports)	Percentage of GDP	World Bank (2016)
$trade$	Sum of exports and imports	Percentage of GDP	World Bank (2016)
$surp$	General government surplus (net lending)	Percentage of GDP	OECD (2016b)
$debt$	General government debt (gross financial liabilities)	Percentage of GDP	OECD (2016b)
$ec^{(c)}$	Error correction term (Equilibrium error)	Residual from FE regression with time effects of $pe^{(c)}$ on $s = (dec^{(c)}, gdp, ue, p15, p65, nx, trade, deb)'$ in (3)	Own calculations
$ideo$	Unweighted mean ideology position of the coalition in government	Between -5 (extreme left) and 5 (extreme right positions)	Döring and Manow (2016)
$elec$	Election date	Date of election (see eq. (1)), zero in years without elections	Own calculations
$pola$	Party polarization index	See eq. (2)	Own calculations based on Döring and Manow (2016)
npc	Number of coalition partners	Integer number	Döring and Manow (2016)

Note: Variable abbreviation, definition, measurement and sources for the variables of the empirical model.

Table 2: Descriptive statistics.

	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
	$pe^{(total)}$				$\Delta pe^{(total)}$				$dec^{(total)}$				$\Delta dec^{(total)}$			
ov	9.58	0.452	7.94	10.5	0.018	0.048	-0.360	0.341	0.262	0.107	0.047	0.507	0.001	0.014	-0.137	0.072
be		0.431	8.54	10.3		0.014	-0.001	0.055		0.104	0.110	0.462		0.003	-0.008	0.006
wi		0.150	8.98	10.2		0.047	-0.369	0.332		0.026	0.141	0.362		0.013	-0.129	0.071
	$pe^{(non-social)}$				$\Delta pe^{(non-social)}$				$dec^{(non-social)}$				$\Delta dec^{(non-social)}$			
ov	8.79	0.131	8.53	9.20	-0.008	0.052	-0.346	0.459	0.276	0.105	0.048	0.645	0.002	0.021	-0.100	0.148
be		0.116	8.61	8.98		0.008	-0.022	0.018		0.104	0.132	0.568		0.004	-0.003	0.011
wi		0.065	8.64	9.20		0.052	-0.345	0.460		0.030	0.101	0.353		0.021	-0.103	0.139
	$pe^{(social)}$				$\Delta pe^{(social)}$				$dec^{(social)}$				$\Delta dec^{(social)}$			
ov	9.35	0.080	9.02	9.48	0.005	0.037	-0.348	0.286	0.254	0.134	0.045	0.615	-0.000	0.017	-0.203	0.071
be		0.069	9.23	9.45		0.006	-0.012	0.018		0.130	0.060	0.566		0.004	-0.011	0.006
wi		0.044	9.04	9.46		0.036	-0.348	0.286		0.036	0.119	0.381		0.016	-0.192	0.069
	$ideo$				$elec$				npc				$pola$			
ov	5.48	1.55	2.60	8.30	0.124	0.261	0	0.972	2.66	1.50	1.00	9.00	0.467	0.192	0.212	1.21
be		0.703	4.54	7.03		0.055	0.047	0.227		1.20	1.00	5.11		0.185	0.238	1.12
wi		1.39	2.55	9.24		0.255	-0.103	1.01		0.930	0.343	7.34		0.063	0.155	0.664
	GDP (in 1000)				Δgdp				ue				Δue			
ov	34.8	13.8	7.89	90.0	0.019	0.033	-0.157	0.125	7.93	3.98	1.80	26.3	0.026	1.33	-4.40	9.70
be		13.5	14.7	76.6		0.013	0.001	0.053		3.28	3.65	16.3		0.168	-0.394	0.539
wi		4.01	16.1	48.2		0.031	-0.185	0.097		2.35	0.009	17.9		1.31	-4.31	9.73
	nx				Δnx				$trade$				$\Delta trade$			

ov	0.021	0.085	-0.209	0.352	0.001	0.023	-0.090	0.207	0.975	0.575	0.167	3.57	0.022	0.076	-0.454	0.287
be		0.081	-0.073	0.282		0.003	-0.005	0.006		0.559	0.254	2.84		0.021	-0.001	0.096
wi		0.030	-0.122	0.170		0.023	-0.089	0.209		0.174	-0.010	1.71		0.074	-0.527	0.278
	<i>p15</i>				$\Delta p15$				<i>p65</i>				$\Delta p65$			
ov	0.171	0.022	0.130	0.243	-0.002	0.002	-0.007	0.003	0.158	0.024	0.105	0.250	0.002	0.002	-0.002	0.008
be		0.019	0.142	0.213		0.001	-0.004	-0.000		0.021	0.109	0.194		0.001	-0.000	0.006
wi		0.011	0.142	0.219		0.002	-0.007	0.004		0.012	0.107	0.213		0.001	-0.000	0.007
	<i>deb</i>				Δdeb				<i>surp</i>							
ov	0.648	0.376	0.067	2.21	0.015	0.059	-0.146	0.305	-2.19	4.80	-32.3	18.7				
be		0.344	0.099	1.57		0.021	-0.019	0.074		3.63	-6.25	11.0				
wi		0.167	-0.040	1.38		0.056	-0.130	0.278		3.23	-31.1	6.05				

Note: Mean, standard deviation (SD), minimum (min) and maximum (max) for three data dimensions, i.e., “ov” (overall) “be” (between) and “wi” (within).

2.2 Empirical Model

Having stochastically trending variables we model dynamics of public expenditure in category c , country i and year t denoted $pe_{it}^{(c)}$, $c \in \{1, \dots, 6, non - social, social, total\}$ in two steps (for a similar approach see, e.g. Gemmill, Kneller, and Sanz 2013; Herwartz and Theilen 2014). First, we employ a fixed effect model to extract deviations from the long-run “fundamental” level, i.e.

$$pe_{it}^{(c)} = \mu_i + \delta_t + \beta' s_{it} + ec_{it}^{(c)}, \quad (3)$$

where μ_i and δ_t indicate country and time effects, respectively, and $\beta' s_{it}$ is a scalar index obtained from the stochastically trending variables in s_{it} .

Adopting an ECM framework, adjustments of $pe_{it}^{(c)}$ are conditionally quantified as

$$\begin{aligned} \Delta pe_{it}^{(c)} = & m_i + d_t + \gamma_1 \Delta dec_{it}^{(c)} + \gamma_2 ideo_{it} \\ & + \alpha_{total} ec_{i,t-1}^{(total)} + \alpha_c ec_{i,t-1}^{(c)} I(c \neq total) + \rho' w_{i,t-1} + z_{it} + e_{it}, \end{aligned} \quad (4)$$

where Δ is the first difference operator, e.g. $\Delta pe_{it}^{(c)} = pe_{it}^{(c)} - pe_{i,t-1}^{(c)}$, and $I(\cdot)$ is an indicator function.⁵ In addition to unrestricted individual (m_i) and restricted time effects (d_t), the right-hand side variables in eq. (4) comprise: (i) current government ideology ($ideo_{it}$) and adjustments of decentralization in spending category c ($\Delta dec_{it}^{(c)}$) which are both considered as jointly determined with $\Delta pe_{it}^{(c)}$; (ii) lagged macroeconomic and fiscal indicators including $\Delta pe_{i,t-1}^{(c)}$ (denoted $w_{i,t-1}$); (iii) contemporaneous political covariates (z_{it}); and (iv) EC dynamics responding to both lagged deviations between total public spending and its fundamental counterpart ($ec_{i,t-1}^{(total)}$), and respective deviations at the sectoral level ($ec_{i,t-1}^{(c)}$, $c \neq total$). The augmentation of common ECMs with $ec_{i,t-1}^{(total)}$ allows sectoral spending to respect total public over- or underspending.

As indicated by unreported LM diagnostics (Kleibergen and Paap 2006) standard panel instrumental variable (IV) estimators applied to the ECM in eq. (4) suffer from underidentification. In contrast, presuming specific patterns of heteroskedasticity as suggested in Lewbel (2012) obtains model specifications for within transformed data which pass both tests on instrument validity and diagnostics against underidentification. Heteroskedasticity-based identification, e.g. applies for unobserved factor models. In our case, error terms e_{it} might share common unobserved factors with residuals inherent in conditioning schemes for $ideo_{it}$ or $dec_{it}^{(c)}$. Let $x_{it} = (w'_{it}, z'_{it})'$, and denote idiosyncratic innovations to $ideo_{it}$ and $dec_{it}^{(c)}$ as u_{it} and v_{it} , respectively. The structural model parameters in eq. (4) are identified if exogenous or predetermined variables x_{it} are available, with $Cov[x_{it}, e_{it}^2] \neq 0$, $Cov[x_{it}, u_{it}^2] \neq 0$, $Cov[x_{it}, v_{it}^2] \neq 0$, and $Cov[x_{it}, e_{it}u_{it}] = Cov[x_{it}, e_{it}v_{it}] = Cov[x_{it}, u_{it}v_{it}] = 0$. In summary, these assumptions allow to use generated instruments $(x_{it} - E[x_i])u_{it}$ and $(x_{it} - E[x_i])v_{it}$ as (additional) instruments to evaluate the ECM in eq. (4) by means of efficient GMM estimation (see Lewbel (2012) for a detailed discussion of identification via heteroskedasticity). We use the STATA module “ivreg2h” (with options “gmm2s” and “robust”) for IV estimation (Baum and Schaffer 2012). Apart from the generated instruments, the endogenous right-hand side variables are further instrumented with $\Delta dec_{i,t-1}^{(c)}$ and $\Delta ideo_{i,t-1}$.

Table 3: Panel unit root diagnostics.

Var	LLC	BD	HS	Var	LLC	BD	HSW
$pe^{(total)}$	0.447 (0.673)	0.200 (0.579)	0.127 (0.551)	$\Delta pe^{(total)}$	-6.117 (0.000)	-2.739 (0.003)	-1.463 (0.072)
$pe^{(non-social)}$	-4.218 (0.000)	-1.625 (0.052)	-0.877 (0.190)	$\Delta pe^{(non-social)}$	-7.941 (0.000)	3.316 (0.000)	1.504 (0.066)
$pe^{(social)}$	-5.322 (0.000)	-1.939 (0.026)	-0.894 (0.186)	$\Delta pe^{(social)}$	-8.467 (0.000)	3.244 (0.001)	1.448 (0.074)
$dec^{(total)}$	1.331 (0.908)	0.629 (0.735)	0.756 (0.775)	$\Delta dec^{(total)}$	-5.766 (0.000)	2.802 (0.003)	-1.922 (0.027)
$dec^{(non-social)}$	-1.616 (0.053)	-0.894 (0.186)	-0.673 (0.251)	$\Delta dec^{(non-social)}$	-7.009 (0.000)	3.836 (0.000)	2.148 (0.016)
$dec^{(social)}$	-0.139 (0.445)	-0.064 (0.474)	-0.129 (0.449)	$\Delta dec^{(social)}$	-7.831 (0.000)	3.644 (0.000)	-2.306 (0.011)
gdp	2.247 (0.988)	0.600 (0.726)	0.709 (0.761)	Δgdp	-4.210 (0.000)	1.425 (0.077)	0.856 (0.196)
ue	-0.634 (0.263)	-0.193 (0.424)	-0.400 (0.345)	Δue	-5.821 (0.000)	2.365 (0.009)	1.374 (0.085)
$p15$	1.715 (0.957)	0.777 (0.781)	0.866 (0.807)	$\Delta p15$	4.374 (1.00)	2.031 (0.979)	2.453 (0.993)
$p65$	1.751 (0.960)	0.873 (0.809)	0.936 (0.825)	$\Delta p65$	4.798 (1.00)	2.579 (0.995)	2.074 (0.981)
nx	-0.549 (0.292)	-0.181 (0.428)	-0.241 (0.405)	Δnx	-8.667 (0.000)	3.525 (0.000)	1.589 (0.056)
$trade$	-2.688 (0.004)	-0.907 (0.182)	-0.890 (0.187)	$\Delta trade$	-10.92 (0.000)	3.637 (0.000)	2.179 (0.015)
$surp$	-5.098 (0.000)	-2.199 (0.014)	-1.246 (0.106)	$\Delta surp$	-10.64 (0.000)	4.226 (0.000)	1.804 (0.036)
deb	1.130 (0.871)	0.417 (0.662)	0.692 (0.756)	Δdeb	-2.725 (0.003)	1.186 (0.118)	1.405 (0.080)

Note: Diagnostics are from Levin, Lin, and Chu 2002(LLC), Breitung and Das 2005(BD), and Herwartz, Siedenburg, and Walle 2016(HSW) for level data (left-hand side) and first differences (right-hand side). p-values in parentheses. BD (HSW) is robust against cross sectional correlations (and heteroscedasticity). Test regressions for level variables (except **surp**) allow for linear trends, all tests for first differences and level **surp** include a constant.

3 Results

Estimating the long-run parameters from short time series obtains heterogeneous results for total public expenditure and its subcategories. Panel DOLS estimators (Saikkonen 1991) of the long-run relation describing $\hat{pe}_{it}^{(total)}$ suggest that expenditure decentralization does not contribute fundamentally to the total public expenditure level, i.e.,

$$\begin{aligned} \hat{pe}_{it}^{(total)} = & \hat{\mu}_i + \hat{\delta}_t - 0.082 dec_{it}^{(total)} + 0.831 gdp_{it} - 0.007 ue_{it} + 1.491 p15_{it} \\ & + 3.097 p65_{it} + 0.153 debt_{it} + 0.699 nx_{it} - 0.044 trade_{it}, \end{aligned} \quad (5)$$

with t -ratios in parentheses. Similarly weak effects of $dec_{it}^{(c)}$ on $pe_{it}^{(c)}$ are also found for spending categories and omitted for space considerations.

As displayed in Table 4, (category specific) public expenditure growth responds throughout significantly negative to lagged deviations from the equilibrium level, thereby supporting the cointegration assumption that underlies the ECM. Comparing fixed effect (FE) and IV estimation of public expenditure growth obtains that IV estimates of potentially endogenous effects are either not covered by 95% confidence regions constructed in the FE model (*ideo*) or close to the lower interval bound ($dec^{(c)}$). Therefore, the evaluation of the influence of decentralization and government ideology on public expenditure deserves robust IV methods.⁶ Robust estimates describing the effects of decentralization on public expenditure (categories) are mostly significantly negative with exceptions observed for the categories social spending and health (insignificant), and education (significantly positive). Hence, except for the education category, our results are at odds with the view that decentralization enhances public spending.

Table 4: Estimation results for growth of public expenditures and its components.

	<i>tot.</i>	<i>tot.</i>	<i>n-soc.</i>	<i>soc.</i>	<i>c = 1</i>	<i>c = 2</i>	<i>c = 3</i>	<i>c = 4</i>	<i>c = 5</i>	<i>c = 6</i>
$\Delta dec_{it}^{(c)}$	-0.909** (-8.70)	-0.721** (-3.73)	-1.55** (-5.52)	-0.130 (-1.59)	-0.746** (-2.37)	-0.228** (-3.21)	-2.13** (-10.6)	0.024 (0.87)	0.552** (3.46)	-0.480** (-3.12)
$ideo_{it}$	-0.003** (-3.18)	-0.001 (-0.60)	0.004* (1.69)	-0.004** (-1.98)	-0.005 (-1.20)	0.004 (1.30)	0.016** (2.56)	-0.002 (-0.68)	-0.002 (-0.76)	-0.012** (-2.67)
$ec_{i,t-1}^{(total)}$	-0.421** (-4.49)	-0.352** (-6.56)	-0.042 (-0.83)	0.045 (1.11)	-0.192* (-1.88)	-0.004 (-0.05)	0.159 (1.10)	-0.016 (-0.25)	-0.062 (-1.18)	0.088* (1.75)
$ec_{i,t-1}^{(c)}$	-	-	-0.318** (-6.65)	-0.402** (-5.74)	-0.334** (-6.11)	-0.337** (-5.40)	-0.302** (-5.90)	-0.252** (-5.75)	-0.350** (-7.69)	-0.215** (-4.38)
$\Delta pe_{i,t-1}^{(c)}$	0.101** (2.40)	0.117** (2.69)	-0.033 (-0.66)	-0.088** (-2.09)	-0.017 (-0.32)	0.020 (0.34)	-0.053* (-1.72)	-0.129** (-1.99)	-0.052 (-0.98)	-0.091 (-1.33)
$\Delta gdp_{i,t-1}$	-	0.230** (3.91)	0.223** (2.62)	-	-	0.576** (3.69)	0.397** (2.13)	0.178* (1.68)	0.172* (1.73)	-0.224** (-2.58)
$\Delta ue_{i,t-1}$	-	-	-	-	-	0.008** (2.23)	-	-0.004* (-1.69)	-	0.004 (1.51)
$\Delta p15_{i,t-1}$	-1.78* (-1.88)	-1.72 (-1.48)	-	-	6.81** (2.80)	-	-	-3.06** (-2.10)	-1.53 (-1.13)	-
$\Delta p65_{i,t-1}$	-4.21* (-1.67)	-2.18 (-1.50)	-	-1.15 (-1.12)	2.70 (1.03)	-	4.90 (1.46)	-	-2.20 (-1.34)	-
$\Delta nx_{i,t-1}$	-	-	0.128 (1.24)	-0.159* (-1.90)	-	-	0.440** (1.98)	-	-	-0.242** (-2.43)
$\Delta trade_{i,t-1}$	-	-	-0.065** (-2.59)	-	-	-0.076* (-1.80)	-0.089 (-1.58)	-	-0.038 (-1.10)	-
$\Delta deb_{i,t-1}$	0.065 (1.10)	0.073** (2.21)	-	-	-0.156** (-2.20)	-	-	-0.072 (-1.50)	-0.045 (-1.10)	-
$surp_{i,t-1}$	0.004** (4.75)	0.004** (3.41)	0.002** (2.16)	-	-0.006** (-4.18)	-	0.007** (3.46)	-0.002** (-2.04)	-0.002* (-1.73)	-
$pola_{it}$	0.045* (1.96)	0.038* (1.78)	-0.006 (-0.25)	0.017 (1.12)	-0.056 (-1.32)	0.043 (1.28)	0.035 (0.63)	0.041* (1.76)	-0.042 (-1.61)	0.021 (0.97)
$elec_{it}$	0.014** (2.18)	0.019** (3.78)	0.001 (0.24)	0.004 (1.04)	-0.009 (-0.90)	-0.000 (-0.03)	0.013 (0.96)	0.016** (2.14)	0.004 (0.66)	-0.005 (-0.73)
nep_{it}	0.002 (0.57)	-0.001 (-0.89)	0.002 (1.12)	-0.000 (-0.10)	0.002 (0.42)	0.003 (0.89)	-0.002 (-0.50)	0.003 (1.06)	0.004* (1.75)	0.003 (1.44)
$cons^{(t)}$	0.004 [±] (0.25)	-0.001 [±] (-0.94)	-0.001 (-0.30)	-0.002 (-1.60)	-0.001 (-0.40)	0.008(†) (2.35)	0.007(†) (1.75)	0.002(†) (0.69)	0.008(†) (3.60)	-0.004(†) (-2.00)
KP		52.6	55.7	53.3	32.3	45.1	55.7	48.9	49.6	21.8
test		(0.001)	(0.000)	(0.000)	(0.054)	(0.002)	(0.000)	(0.003)	(0.005)	(0.293)
Hansen		17.9	17.7	20.1	17.1	19.7	17.1	25.6	27.6	16.7
J		(0.806)	(0.605)	(0.218)	(0.649)	(0.476)	(0.843)	(0.375)	(0.378)	(0.541)
d		24	20	16	20	20	24	24	26	18

Note: Estimation results from fixed effect (FE, 2nd column) and GMM-IV estimation (columns 3–11). Robust t-ratios in parentheses. Significance at 5% and 10% is indicated with “***” and “**”, respectively. The number of observations is 368. Diagnostics include the LM statistic of Kleibergen and Paap (2006) testing underidentification, and the J-statistic from Hansen (1982) testing orthogonality of d overidentifying instruments. Degrees of freedom for the KP test are d+1. “cons” provides intercept estimates, the † indicates if the model includes restricted time dummy variables with positive or negative sign for selected periods. Period selection relies on significant time effects in FE models.

Similar to recent literature, the model does not unravel an impact of government ideology on total public spending during the last two decades (Herwartz and Theilen 2014, Herwartz and Theilen 2017). Distinguishing main categories, however, it turns out that with 5% (10%) significance left-wing (right-wing) governments put more weight on social (non-social) expenditure growth in comparison with their right-wing (left-wing) counterparts, a result, that is in line with economic theory (Cameron 1978; Alesina 1987).

Lagged macroeconomic indicators show plausible effects on growth of total public expenditures, e.g. GDP growth, budget surplus and positive changes of public debt impact positively on future public expenditure growth. Regarding political indicators we find that growth rates of public spending are higher in election years and in more polarized political systems. Since total public expenditures comprise heterogeneous categories, as expected, the marginal effects of both groups of indicators lack homogeneity across categories.

4 Conclusions

Recent tendencies of expenditure decentralization have been argued to contribute to an increase of public spending. By means of error correction models we quantify the influence of expenditure decentralization on total public spending and most of its subcategories for a panel of 23 OECD economies with annual data from 1995–2013. We resolve the intrinsic endogeneity problem between public spending, decentralization and government ideology by applying a novel approach proposed by Lewbel (2012) that allows the identification of valid instruments exploiting specific patterns of heteroscedasticity. We find that instead of spurring the growth of public spending, recent tendencies of expenditure decentralization in developed economies, rather, have turned out to mute expenditure growth.

Our results have important implications for ongoing policy debates. In Spain, after a long period of expenditure decentralization from the central government to regional governments it is now questioned whether the decentralization process has gone too far, as regional debt has heavily increased after the financial crisis in 2008. Our results suggest that decentralization as such cannot be made responsible for this development, and that in a more centralized economy debt would have also increased.⁷ In Germany, the fiscal constitution needs to be re-designed by 2019. While the fiscal equalization system is a major concern of this reform, it also affects the relationship between the central and the state governments. Here, our results suggests that policy-makers who desire to reduce public expenditure should be active in implementing more expenditure decentralization, or at least, vote against a re-centralization.

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Notes

¹See also the excellent overview of the literature on the influence of partisan politics on economic policy by Potrafke (2016).

²Petterson-Lidbom (2008) has applied a regression discontinuity approach to Swedish municipal data. However, since this approach only makes use of a small part of the data it requires rather large data sets that are, nowadays, not available for cross-country comparisons in the OECD.

³The country and sample period selection are due to data availability. Data on subnational levels and subcategories of public expenditure in OECD (2016a) is available for the period 1995–2013. Due to missing values for JAP (1995–2004), NOR (1995–2001), SLO (1995–1998), and the UK (1995–1996) the panel is unbalanced.

⁴Because spending is completely centralized or relatively low we do not consider the categories: defence; environment protection; housing and community amenities; recreation, culture and religion.

⁵The unit root diagnostics justifying our model approach are in Table 3.

⁶Documented estimates are the result of general to specific modelling. Subsequently, variables with least significance were removed until all t -ratios become larger than unity in absolute value. Hence, joint insignificance of imposed restrictions is likely at conventional levels. Core explanatory variables, namely $\Delta dec_{it}^{(c)}$, $ideo_{it}$, $\Delta pc_{i,t-1}^{(c)}$, $ec_{i,t-1}^{(total)}$, $ec_{i,t-1}^{(c)}$ ($I(c \neq total)$), have not been subjected to variable selection.

⁷Noticeably, the debt level of the Spanish central government during the same period has also seen substantial expansions.

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