

Fernandez, Rosa Maria

Article

Interactions of regional and national environmental policies: The case of Spain

Cogent Economics & Finance

Provided in Cooperation with:

Taylor & Francis Group

Suggested Citation: Fernandez, Rosa Maria (2018) : Interactions of regional and national environmental policies: The case of Spain, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 6, Iss. 1, pp. 1-15,
<https://doi.org/10.1080/23322039.2018.1442092>

This Version is available at:

<https://hdl.handle.net/10419/194765>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>



Received: 03 August 2017
Accepted: 14 February 2018
First Published: 23 February 2018

*Corresponding author: Rosa Maria Fernandez, Department of Social and Political Science, University of Chester, Westminster Building CWE110, Parkgate Road, Chester CH1 4BJ, UK
E-mail: r.fernandez@chester.ac.uk

Reviewing editor:
Salvatore Ercolano, Università degli Studi del Sannio, Italy

Additional information is available at the end of the article

GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

Interactions of regional and national environmental policies: The case of Spain

Rosa Maria Fernandez^{1*}

Abstract: This paper uses a new approach to the concept of green budgeting within the context of green economy to analyse the different factors influencing the lack of consistency on environmental policies in Spain. It appears that structural issues have prevented Spain from becoming a real green economy, and thus from taking the right measures that could lead it into a sustainable growth path. This case study is presented as example of failure to integrate environmental issues in policy-making, with political factors being one of the main variables under analysis. A quantitative analysis on the approach to public environmental budget management during the period prior to the recent economic crisis is conducted at national and regional levels. Some of the findings are consistent with other European countries but some distinctive structural issues are also identified.

Subjects: Public Policy; Budgetary & Economic Policy; Environmental Politics; Econometrics; Environmental Economics

Keywords: decentralisation; environmental policy integration; green budgeting; Spain

1. Introduction

When it was clear that the international economic crisis that affected most Western countries since 2008 was deeper and more difficult to solve than expected, initiatives started appearing calling for

ABOUT THE AUTHOR

Rosa Maria Fernandez has a PhD in Economics at UNED (Spain). She is a senior lecturer and the programme leader for Economics at the University of Chester. She previously holds positions at UNED and Birmingham, and has also been a visiting researcher in Exeter, Bradford and York (Toronto). Her main research areas are environmental and energy economics and policies. She is a co-opted committee member of UACES (Academic Association for Contemporary European Studies) and a reviewer of research grant applications for the COST initiative of the European Commission and ESRC in the areas of sustainability, environment, climate change and energy. She has also reviewed papers for *Cogent Economics and Finance*, *Cogent Business and Management* and *Energy Policy* journals.

PUBLIC INTEREST STATEMENT

This paper presents the first quantitative analysis of political preferences and partisanship influence on public environmental budget determination, using Spain as case study. The research has taken place in two stages: Firstly, time series regression analysis of environmental budget allocated to the Ministry of Environment as a proportion of the total non-financial national budget, only used as indication of behaviour patterns; and main panel data random effects analysis to regional environmental budget allocations before the economic crisis of 2008. The results show that with regard to environmental budget Spain was not the frontrunner internationally perceived before the crisis. They also indicate that structural issues such as traditional high levels of unemployment are the key determinants for budget allocation. Most importantly, they also show influence of the political party in power to commit budget for environmental protection, particularly when the parties don't have absolute majority and need support from regional parties.

a new approach on the way that macroeconomic and financial issues were tackled. The opportunities offered by the economic sectors related to environmental protection and sustainable development in terms of employment creation and growth were presented as the best chance to get out of the crisis at the same time that global problems such as climate change and depletion of natural resources would be acted upon. This has been the basis for what was called “Global Green New Deal” (UNEP, 2009), which includes as domestic elements sector-targeted fiscal stimulus and policy reforms that allow the right investments (green investments) to take place. Within this context, green budgeting has been defined as the “integration of environmental concerns into government fiscal cycles” (Wilkinson, Benson, & Jordan, 2008), but efforts so far have focused on the approval of green taxes or favourable regulatory regimes for sectors such as renewable energy (European Environmental Agency, 2011, 2013) or the allocation of funding to undertake particular environmental investments (OECD, 2010) with very little evidence of a systematic or integrated approach.

Acknowledging these facts this paper will focus on the budget that is initially allocated to the governmental bodies that make the decisions about which environmental projects to undertake and how much funding dedicate to each of them. The rationale behind this approach relies on the fact that if initially there is not much budget allocated, the measures approved and subsequently the potential positive results will be limited. Literature on the factors determining public budget allocation is quite extensive (Mogues, 2012; Sanz & Velazquez, 2003; Tridimas, 2001) but the area of environmental expenditure has been traditionally neglected (Pearce & Palmer, 2001). Effectiveness of the expenditure itself is out of the scope of this paper and left for future research, where some general examples can also be found on the literature (Mandl, Dierx, & Ilzkovitz, 2008) but on a much more limited extent for particular case studies (Soukopova & Bakos, 2013).

Additionally, the evidence so far seems to indicate that the impact of the so-called green budgeting is questionable or limited, and that reasons behind budget allocation are conditioned by political and policy preferences (Russel & Benson, 2014). This is consistent with the usual public expenditure literature that identifies the areas for budget allocation in relation to the policy issues perceived as the more attractive for policymakers in terms of maximisation of expected political support (Tridimas, 2001).

Spain appears as an attractive case study given the fact that fiscal policies associated to the renewable energy sector have been working since the eighties (Held et al., 2007) which would suggest a forefront approach and a relative advantage on the grounds that a green economy would be better resilient to crises (UNESCAP, ADB, UNEP, 2012). Spain is, however, struggling to recover, with one of the highest unemployment rates among the European Union Member States (19.6% in 2016 according to Eurostat) and with controversial measures recently approved (Coats, 2014; Mendoza, 2015), which suggests that what could have been a sustainable path hasn't been correctly followed. This situation makes it worth to examine the partisanship relationships existing between different levels of government and their influence on budget allocation, particularly prior to the crisis, in order to assess if the seeds for a green economy pre-existed or not. Literature suggests (Solé-Ollé & Sorribas-Navarro, 2008) that a lower level of government will receive more funding from an upper tier if both belong to the same political party. While the previously mentioned study focuses on local, upper local and regional levels of government, this paper will look at the interactions between national and regional levels of government.

The main area of analysis in this paper focuses on the governmental behaviour with regard to environmental budget management prior to the crisis in trying to find out the underlying problems of the Spanish economy and if the political constraints identified for other countries could be also affecting this case. More precisely, it will try to find out the effect of partisanship on environmental budget allocation at national and regional levels. The research questions that will be addressed are as follows: Was the situation in Spain prior to the last economic crisis as good as it was perceived with regard to environmental and renewable energy policy (i.e. was Spain really a frontrunner of the sustainability path?) and, to which extent the differences between political parties in power can

condition the public budget dedicated to environment? In the following sections, background information about the political and economic situation in Spain will be given, in order to contextualise the analysis; methodology will be explained; and preliminary results presented, finishing with concluding remarks.

2. Spanish political and economic contexts

Spain is a relatively young democracy, with the approval of its current Constitution in 1978 after a long period of dictatorship. Though the political arena changed due to the crisis (Chislett, 2012) at national level it is still dominated by the two majoritarian parties: socialists and conservatives. However, this bipartidism has been challenged in the last national elections that due to lack of clear majority had to be repeated (December 2015 repeated in June 2016). The conservative party managed to form a minority government and there are two new parties in the political arena that have obtained considerable representation (Podemos and Ciudadanos) (Jones, 2016).

The Constitution set the basis for a decentralised system and Spain has seventeen autonomous regions with capabilities to create laws and manage their own budgets, with regional parliaments and with even more decentralised levels of government in the form of provinces and local authorities, which also have their own budgets (Alonso-Sanz, 2010). Within this context and bearing in mind that the levels of autonomy are uneven across regions and have been achieved progressively over different legislative periods, it is difficult to undertake an analysis that includes all the factors that may have been influencing political measures at regional and national levels simultaneously for a particular period of time.

This is remarkably difficult in the case of environmental and energy-related measures. The Constitution (Boletín Oficial del Estado, 1978, Arts. 148 and 149) establishes that the State will have the competencies to regulate the basic framework on environment and energy matters, but the autonomous regions will have the management authority, unless it is related to issues (such as electricity networks or water reserves) that affect more than one region. The State will, however, keep the competencies that the autonomous regions don't assume. When the devolution process (transfer of competencies) is analysed, it can be observed that environment is not mentioned, and the focus is given to social security, health and education (Alonso-Sanz, 2010). Decentralisation is important since on average around 50% of the public expenditure depends on local and regional governments (Ballart & Zapico, 2010).

From the economic point of view, Spain has focused on traditional sectors with low added value, and even during periods of sustained economic growth, unemployment levels have been much higher than in other European countries (OECD, 2012), particularly for young people. Spain is under an Excessive Deficit Procedure since 2009, which has imposed hard austerity measures and reduced public expenditure in most areas, including environment. It was guaranteed several extensions to finish with it up to 2018 but at the same time high risks to the sustainability of the budget system were identified for the medium term, particularly with regard to pensions' expenditure (Official Journal of the European Union, 2013). As part of the procedure and the conditionality of the bailout that was approved for the banking system in 2012, Spain's finances are heavily scrutinised, with the European Commission, the European Central Bank and the International Monetary Fund monitoring every budget proposal (Council of the European Union, 2013). Within this context, it can be argued that both internal and external factors, and both structural and temporary ones have affected what has happened with the national budget in Spain during the last years, which makes the question about the management before the crisis more pertinent. The cuts on expenditure have been noticed in all the areas, except in the funding dedicated to unemployment benefits for obvious reasons. It is noticeable nevertheless that one of the biggest reductions has affected to the Ministry of Environment (& Agriculture), as shown in Table 1. Though the effects of the crisis on public expenditure in general and environmental expenditure in particular have been noticed across the EU, the figures for other countries do not appear to have experienced such a dramatic change (Eurostat, 2014) and there are

Table 1. Main budget reductions (% over previous year)

	2009	2010	2011	2012	2013	2014*	2015*
Environment (and agriculture)	1.2	10.5	31.3	19.9	25.4	(3.0)	(14.0)
Industry, energy and tourism/commerce	(25.4)	2	12.4	31.9	21.3	(31.6)	(11.3)
Education, culture and sport	(6.1)	(2.1)	7.8	21.2	17.2	(6.6)	(3.0)
Infrastructures	(2.6)	6.4	34.6	18.4	11	(0.2)	14.2
Foreign affairs and cooperation	0.2	2.5	8.6	43.6	10	8.8	(4.9)

Notes: Figures in brackets indicate increase instead of reduction. *In 2014 and 2015, though the Ministerial distribution remains quite similar, when looking at expenditure chapters “environment” is not mentioned. Industry and energy appear jointly in one chapter and Tourism and Commerce appear in another chapter.

Source: Ministerio de Economía y Hacienda (2008–2011); Ministerio de Hacienda y Administraciones Públicas (2012–2014).

countries where environmental expenditure has increased at least temporarily, such as the case of Finland (Statistics Finland, 2014).

These differences make it relevant to undertake a quantitative analysis to determine which are the most influential factors on budget behaviour before the crisis, with a specific interest on the environmental one, in order to see if the situation was really as good as it seemed, and if quantitative data corroborate the issues mentioned in the previous paragraphs.

2.1. A note about renewable energy

One would expect that environmental and energy issues would be closely treated given the influence that fossil fuels usage has on greenhouse gas emissions and ultimately on environmental degradation. It cannot be said that this has happened in the Spanish case.

Spain is not rich in fossil fuels so it has been dependent on imports for many decades. The relatively high economic growth rates that the country experienced in the recent past were accompanied by an increase in energy consumption that has not been absorbed by the also high increase in energy generated by renewable sources. This has to do with the slow progress achieved on energy efficiency measures, at least if we look at it in terms of energy intensity (See Eurostat), which is more than likely connected with the traditional sectors the Spanish economy has focused its growth on, and shows that Spain has not been capable to decouple energy consumption from economic growth. Additionally, renewables contribute mainly to electricity generation but energy consumption has other components, and though Spain has shown some advantage in the electricity area compared to other European countries, on average is at the same level as the European Union as a whole (See Eurostat).

The progress of the renewable sector was promoted through a favourable regulatory regime, but mainly with an inefficient feed-in-tariff system that had been continuously modified till it was finally cancelled in 2012 (Coats, 2014; Del Rio & Mir-Artigues, 2014). However, it seems obvious that the promotion of the sector has been mainly motivated by economic interests instead of environmental ones, and quite possibly also influenced by the regulations coming from the European Union establishing targets on the use of renewable sources of energy, as a consequence of the signature of the Kyoto Protocol and as part of the Energy and Climate Change Package (Official Journal of the European Union, 2009), which means that the environmental concern has been brought by external actors instead of being part of an internal cultural or societal demand.

The only area of the Environment Ministry budget that is somehow related to energy has to do with water infrastructures. In the period under analysis (from 1995 onwards) between 70% and 85% of the investments of the Ministry were dedicated to improvement, maintenance or construction of water infrastructures (Ministerio de Economía y Hacienda, 1995–2011; Ministerio de Hacienda y

Administraciones Publicas, 2012). However, their principal aim was to guarantee access to water for human consumption and agriculture, avoid leakages in the distribution system and improvement of water quality.

At the moment if there is not a change in policy Spain will not meet its 2020 targets for renewable energy usage (European Renewable Energy Council, 2013).

This paper will focus on the environmental aspect only, acknowledging the interactions existing between environment and energy in particular, and their respective impacts in economy and society.

3. Data and methodology

This paper adapts a model developed by Hicks and Swank (1992) to account for political parties' and other factors influences on welfare expending, bearing in mind the particular characteristics and circumstances of the Spanish system. This approach differs from others applied in the public budget literature (Sanz & Velazquez, 2003; Tridimas, 2001) which focus on the determinants of demand for public goods as a function of national income and prices of the public (or private) goods and services generated. The political factors are included in these studies, in the case of Tridimas (2001) with the division of two political parties and with Sanz and Velazquez (2003) focusing on the difference in the visibility of the areas of government that citizens perceive. None of these approaches is valid for the purposes of this paper since as it is commonly recognised, one of the difficulties for environmental policies is the assignment of monetary value or price to environmental goods and services (Perman, Ma, Common, Maddison, & McGilvray, 2011). It is also worth clarifying that this paper only analyses the public expenditure even if some authors point out that environmental policy has been characterised by large amounts of private expenditure due to the specific nature of the environmental regulations (Pearce & Palmer, 2001). Additionally, this study tries to establish to which extent there have been exogenous factors influencing the way environmental budgets are managed, following elements of the punctuated equilibrium theory (Baumgartner, Foucault, & François, 2006), which is a novelty in the environmental budget literature. To this aim, time shocks are included in the regional analysis, as explained later and observed in the results table (Table 3).

The analysis has been undertaken in two major phases: The first one collects data from the Spanish National Budgets documentation between 1995 and 2014 and presents as dependent variable the percentage of the State non-financial budget allocated to the Environment and Agriculture Ministries (Ministerio de Economía y Hacienda, 1995–2011; Ministerio de Hacienda y Administraciones Publicas, 2012, 2013). Agriculture is included as so far only between 1997 and 2008; there has been an independent Environment Ministry, and not considering them together would have left an already reduced number of observations even lower. It is worth mentioning that the Environment Ministry budget has never represented a big proportion of the total national budget (1.5% on average—Ministerio de Economía y Hacienda, 1995–2011; Ministerio de Hacienda y Administraciones Publicas, 2012) and energy has been part of the responsibilities of the Ministry of Industry and Energy, or in some cases the Ministry of Economy. This separation between energy and environment, and the inclusion of agricultural issues together with environmental ones is not exclusive of the Spanish case and we find a similar approach in the United Kingdom (HM Treasury, 2013) but in the latter case it is easier to isolate the data related to expenditure on energy.

Only the budget for the Ministry of Environment is looked at, without including the total budget and/or its composition in order to account for possible interactions. On one side, the fact that the dependent variable is the proportion with regard to total national budget, with a very low value as it was previously mentioned, tries to care for it. On the other side, it is observed that the biggest proportions of the budget are dedicated to public debt (more than 20%) and unemployment (around 15%), with the rest of departments accounting for reduced figures (between 1 and 4% in general) (See for instance, Ministerio de Hacienda y Administraciones Publicas, 2013–2014). At the moment it is considered that the variables GDP and unemployment, as explained below, account sufficiently for these facts.

It is also worth mentioning, in trying to determine if the behaviour of the government has been in line with the green budgeting and green economy approaches, that the first time a “Green Fiscal Reform” appears on the budget proposal is on the one for 2006 (Ministerio de Economía y Hacienda, 2005), in a context where the regulation of the feed-in-tariff system to promote renewable energies had started being modified to increase the requirements and make more restrictive the access to the primes system, and also to reduce these primes (Held et al., 2007).

With regard to political parties, as it was previously mentioned, at national level Spain has been characterised by a bipartidist system (Casal Bertoa, Ferrin, & Pardos-Prado, 2010)—socialists and conservatives—so the model does not include as many variations as the Hicks and Swank case. Given the reduced time series available, results at national level won't be presented in detail, but for comparative purposes main information is summarised.

The proportion of State non-financial budget dedicated to environment is made dependent on GDP, unemployment, environmental tax revenues, political party in government, EU funding and the crisis. The reason to include a variable covering the funding received from the European Union is that the budgets specify that resources to improve environmental infrastructures at local level come from the European Community (Ministerio de Economía y Hacienda, 1995–2011) so they are managed apart from the National Budget. It would be expected that if these funds are high the amount allocated by the National Budget to environment wouldn't need to be so high (negative coefficient) as the needs are covered by another source. Spain has been one of the biggest receivers of Structural Funds from the European Union (Swidlicki, Ruparel, Persson, & Howarth, 2012), so it was initially expected that this variable would be significant. In that regard, EU funding is seen as an external factor.

Given the fact that Structural Funds are allocated by region (though the data available is the total amount per country), the analysis of the 17 Spanish regions plus Ceuta and Melilla (analysed together) is undertaken. This is the second phase and main body of the analysis. In this case the number of years is quite reduced (between 1995 and 2001) but this is the only period for which the National Statistics Office (INE) has produced data on regional expenditure on environmental protection (including current and capital expenditure) (Instituto Nacional de Estadística, n.d.). Crisis years are not included, which gives the opportunity to consider if regional government behaviour was proactive towards a green economy as it was initially expected. It also brings the opportunity to study political parties' effects at a wider extent since at regional level there are more participants, with regionalist/nationalist parties playing a governing role in some of the regions, bringing more similarities to Hicks and Swank's (1992) study. The funding received from Europe is measured through dummies that classify regions by their eligibility to receive Structural Funds. All the Spanish regions are classified as Objective 1, 2 or 5b in the period considered (European Commission, 2008), which means that most of the country's geography was entitled to some sort of Funds, with Objective 1 being the regions in worst economic position and thus entitled to more funding. One of the most important sources of structural funding is the European Regional Development Fund, whose focus is precisely the promotion of investments on infrastructures and environment (European Commission, 2008).

The regression used in this case for the study of panel data (random effects) is as follows, with descriptions in Table 2:

$$\text{EnvExpGDP}_{it} = \alpha_0 + \alpha_1 \ln \text{GDPpc}_{it} + \alpha_2 \text{Unemployment}_{it} + \alpha_3 \text{RegGov}_{it} + \alpha_4 \text{NatGov}_{it} + \alpha_5 \text{TimeShocks}_{it} + \alpha_6 \text{EUFundingDummy}_{it} + \varepsilon_{it} \quad (1)$$

The use of a fixed effects model instead of a random effects one was considered, but based on Clark and Linzer's (2015) work, it was decided that having a data-set with a reduced number of units (18) and reduced observations per unit (7) a fixed effects model would not contribute significantly to improve the analysis. In addition, a Hausman test was conducted (Greene, 2008) and the results are consistent with the appropriateness of a random effects model.

Table 2. Regional data regression variables

Variable name	Description
EnvExpGDP _{it}	Environmental Expenditure: Amount (budget) dedicated to environmental protection in each region as a percentage of the regional GDP
lnGDPpc _{it}	Regional GDP per capita (normalised as natural logarithm)
Unemployment _{it}	Unemployment level as percentage of the total regional labour force
RegGov _{it}	Regional Government: Dummy variable representing the sign of the political party governing in the period considered and if it was a government with absolute majority or in minority. The values in the different regions for the period under study are:
	0: Conservative in minority (RegGov1)
	1: Socialist in minority (RegGov2)
	2: Conservative with absolute majority (RegGov3)
	3: Socialist with absolute majority (RegGov4)
	4: Nationalist/Regionalist with absolute majority (RegGov5)
	5: Nationalist/Regionalist in minority (RegGov6)
NatGov _{it}	To show the interaction between Regional and National governments, the national governments in the period under study are included:
	0: Conservative Government in minority (natgovdummy1)
	1: Socialist Government in minority (natgovdummy2)
TimeShocks _{it}	2: Conservative Government with absolute majority (natgovdummy3)
	To explore the possibility of time shocks, the following values are given:
	Year 1 = 1995
	Year 2 = 1996
	Year 3 = 1997
	Year 4 = 1998
	Year 5 = 1999
	Year 6 = 2000
	Year 7 = 2001
EUFundingDummy _{it}	Dummy Variable classifying the regions by their eligibility to receive EU funds. During the period under study, all the Spanish regions received funds (European Commission, 2008), being:
	Objective1 (Highest level of funding): DummyFunding1
	Objective2: DummyFunding2
	Objective5b (Lowest level of funding): DummyFunding3
ε _{it}	Error term

The dependent variable in this case (EnvExpGDP_{it}) reflects the specific amount dedicated to environmental protection as a percentage of the regional GDP, so it is expected that despite the reduced number of years used for the analysis the results will show more precision for the purpose of this study, since the expenditure on agriculture is excluded.

The period considered reflects sustained economic growth in terms of GDP per capita and reduction of unemployment. With the exception of 2001, there seems to be an indication that the better the economic situation the bigger the amount of funding dedicated to environment protection. It is not possible to assess if this is just a pro-cyclical behaviour or if the expenditure reflects a proper green policy. However, differences can be observed between regions, with some of them spending well below the average (Cantabria and Extremadura spending less than 1% of the regional GDP in the period under analysis), while others (Navarra and Castilla-La Mancha) reach more than 2% of the regional GDP. To some extent this could be explained by the different levels of GDP per capita in each of the regions, with those in the lower range spending less (Extremadura) and those in the higher

range spending more (Navarra and Vasque Country). Interestingly though, Navarra and the Vasque Country are governed by regionalist/nationalist parties in the period under analysis, instead of the traditional conservative/socialist ones.

Regional differences can also be influenced by geographical considerations. The period between 1992 and 1996 saw how Spain experienced heavy draughts, with some very specific areas of the country suffering temporary water cuts (Torgler & Garcia-Valiñas, 2005). This means that the period under study (1995–2001) saw the proliferation of initiatives to correct the effects of the draughts, improving the citizens' perception of how well environmental policies were working. This may have contributed to the understanding that there was no need to increase environmental resources any more as sufficient policies were already in place (Torgler & Garcia-Valiñas, 2005).

In addition to separated analysis of national and regional data, the possible interactions of the differing political parties in power in regional and national governments have been analysed too. This has been done through the addition of two more dummy variables: *Interacnatreg* (Conservative government at national level and Socialist at regional level) and *Interactregnat* (Conservative government at regional level and Socialist at national level). Results will be described in the next section though they have not been tabulated. It needs to be noticed with regard to this aspect that elections in the autonomous regions do not take place at the same time as the national ones, or at least not for all of them, so the legislative periods can be on different stages of maturity for the central and regional governments.

Nevertheless, and even if the observed period is short, the analysis has also included a control for possible time shocks in line with the punctuated equilibrium approach (Baumgartner et al., 2006) though not using the same model due to lack of a sufficiently long data period. Each of the years under analysis have been added (Columns (2)–(4) of results table) in order to identify if any of the years stood out. Findings are explained below.

4. Preliminary results

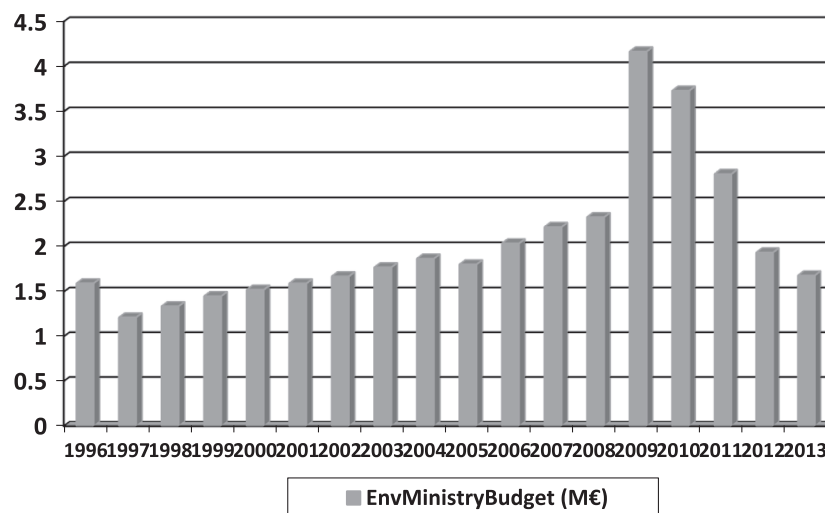
It is acknowledged that due to the limited time series used at national level results obtained may be spurious, but the analysis was pursued in order to have an idea of indicative behaviours and to compare national government behaviour with regional one during the same period. The initial analysis showed that results differ if political party in government and absolute majority are considered as one variable or two separated variables. In the latter case, if environmental tax revenues are presented as a percentage of the total taxes, the sign of the political party in government becomes significant, with a positive impact in the case of a socialist government.

In trying to interpret the rest of results at national level, it appears that EU funding is not a significant variable and more surprisingly neither seems to be the crisis. This would contradict expectations that follow the punctuated equilibrium theory approach (Baumgartner et al., 2006). Environmental tax revenues appeared not to be significant as percentage of GDP. This could be reflecting the fact that there is no green tax system in place and revenue coming from environmental taxes is not showing a trend consistent with the growth in the Environmental budget (Figure 1). This would also be consistent with the initial assumption that structural issues more than temporary ones are the defining variables for the behaviour towards environmental protection in Spain.

What can also be observed quite clearly is that unemployment consistently appears as a significant variable with a negative sign that makes sense in terms of having fewer resources to be dedicated to environment if unemployment rates are growing. This is consistent with findings for other countries where it appears that unemployment insurance is the most counter-cyclic programme (Snyder & Yackovlev, 2000; for the US, and Hicks & Swank, 1992 for OECD countries). It can also be noticed, but only when taking tax revenues as a percentage of the total taxes, that political parties start having some significance, with what seems to be an indication that a socialist government without absolute majority would increase the budget allocated to the Environment Ministry. It is not clear

Figure 1. Environment Ministry Budget as a percentage of National non-financial Budget.

Source: Ministerio de Economía y Hacienda (1995–2012).
 Notes: (1) The budgets for 1996 and 2009–2012 are the Environment and Agriculture Ministry together as there was no independent Environment Ministry on those periods. (2) The budget in 1996 was an extension of the 1995 one, since the lack of support of nationalist parties made the new budget proposal rejected, which ultimately caused the national elections to be celebrated before the usual 4-year period (Inter-Parliamentary Union, 1996).



though if this is due to the preferences of the governing party or to the influence that the supporting nationalist/regionalist parties would have on the budget approval process.

These inconclusive results justify undertaking the analysis at regional level for the period before the crisis. Table 3 presents some of the results in the analyses performed. Environmental tax revenues are not included since for the period under analysis only four regions had started applying any type of environmental tax (Economics for Energy, 2013). In general, autonomous regions have the capability to issue taxes but they have been doing so in a very uneven way, with some regions having several environmental taxes in place, mostly related to water pollution and illegal waste, and some others hardly having any (Magadan Diaz, 2008). It is even more surprising to some extent that only in the first approach (column (1)) the possibility of receiving funding from the European Union seems to be significant, for Objective 1 regions but not for the rest. This contradicts the initial expectations bearing in mind the increasing amounts still received by the Spanish regions in the period under analysis.

Interestingly, also in the first approach unemployment level appears not to be a significant variable but GDP per capita is. This is reversed in the rest of approaches as it will be explained later. The most remarkable result is the fact that political parties appear as a significant variable, both at national and regional levels of government. At regional level the influence is positively significant when the party in power has absolute majority, while at national level results differ between the first approach and the rest. The former seems to indicate that when the minority appears in the central government the influence is positive for environmental expenditure, regardless of the sign of the political party. The latter approaches seem to indicate a significant negative influence only when a socialist party is in a minority government, which would contradict the results obtained for the analysis at the national level. One possible explanation for such an outcome could be that when regional governments have to act without majority, the existence of a higher number of political parties in the regional sphere would make it more difficult to reach consensus, which would leave issues such as environmental protection in the background or as a secondary problem, while with majority all issues including environment would receive the necessary attention and funding. However, when the budget needs to be approved at national level, the first approach suggests that the party with minority would listen to possible environmental concerns that regional or nationalist parties may bring to the table as they would feel empowered to do so, showing that they can play a role in

Table 3. Regional analysis

	(1)	(2)	(3)	(4)
	Env. Exp.	Env. Exp.	Env. Exp.	Env. Exp.
Ln(GDPpc)	1.302*** (0.142)	−0.223 (0.302)	−0.239 (0.254)	−0.223 (0.534)
Unemployment	0.00177 (0.00352)	0.00602** (0.00281)	0.00580** (0.00247)	0.00602** (0.00274)
RegGov1	0.0148 (0.0418)	0.0224 (0.0325)	0.0299 (0.0290)	0.0224 (0.0390)
RegGov2	0.0418 (0.0465)	−0.0105 (0.0370)	−0.0109 (0.0326)	−0.0105 (0.0305)
RegGov3	0.141** (0.0628)	0.102** (0.0503)	0.115** (0.0457)	0.102*** (0.0361)
RegGov4	0.200*** (0.0599)	0.127*** (0.0475)	0.135*** (0.0424)	0.127*** (0.0385)
RegGov5	0.139*** (0.0400)	0.0951*** (0.0318)	0.0865*** (0.0271)	0.0951* (0.0571)
NatGovdummy1	0.0762*** (0.0234)	−0.0139 (0.0247)	−0.0139 (0.0214)	−0.0139 (0.0300)
NatGovdummy2	0.102*** (0.0350)	−0.441*** (0.0893)	−0.441*** (0.0753)	−0.441*** (0.162)
Dummyfund1	0.360*** (0.133)	−0.215 (0.167)		−0.215 (0.225)
Dummyfund2	−0.00201 (0.0286)	−0.0145 (0.0231)		−0.0145 (0.0254)
Year1(1995)		−0.0309 (0.0238)	−0.0312 (0.0205)	−0.0309 (0.0322)
Year3(1997)		−0.378*** (0.0616)	−0.378*** (0.0519)	−0.378*** (0.116)
Year4(1998)		−0.281*** (0.0453)	−0.280*** (0.0382)	−0.281*** (0.0843)
Year5(1999)		−0.138*** (0.0274)	−0.135*** (0.0230)	−0.138*** (0.0475)
Constant	−11.35*** (1.424)	3.812 (3.008)	3.828 (2.476)	3.812 (5.285)
N	126	126	126	126
R ² within	0.8827	0.9367	0.9366	0.9367

national politics attracting funding to their regions for a topic that theoretically attracts voters' attention. This would be consistent with other (non-quantitative) studies that corroborate for the Spanish case the fact that at regional level parties would be competing for power against each other so common agendas would be less frequent, while at national level if there is minority to govern they would support the party in government expecting a mutual support in their respective regions (Field, 2014). Surprisingly, the influence of a socialist party in subsequent analyses appears to be negative, when the perception is that socialist parties have a greener approach to politics. In this case, the results may be justified by the weakness to take action that minority socialist governments have traditionally faced. Something that can be said though is that results appear to be consistent with

the only other study (non-quantitative) in this area, Russel and Benson (2014), for the US and the UK, which reflect an influence of political parties on budget determination but also a limitation of this influence.

It becomes apparent for the Spanish case that regional politics affect national politics and vice versa. But it is not so clear which is the influence for environmental policies and their related budgets. Empirical evidence (Chagues, Monpetit, Palau, & Munoz, 2012) shows variety of situations in Spain though in general it is considered that there would be stability and therefore better policy development if the central government with minority and the regional one, with minority too, belong to the same party. The partisanship effect would also exist between regional and local levels, as shown by Solé-Ollé and Sorribas-Navarro (2008). This is not clearly reflected in this study, since the period considered (1995–2001) has been mostly characterised by a conservative central government with minority, while regionally there was still a predominance of socialist or nationalist governments.

Though not included in table results, this type of interaction was specifically tested for the cases in which the national government was conservative and the regional one socialist, and vice versa, as it would cover the situation of most of the autonomous regions in the period considered. The results obtained show that only in the former case (national conservative government and regional socialist government) there is a small positive influence on regional environmental budget that can be considered statistically significant. This is only observed if time shocks are not included, but it is again remarkable to notice a positive influence of a conservative government.

In trying to improve the explanatory level of the model, subsequent analysis undertaken explored the possibility of time shocks (columns (2)–(4)). Results seem to indicate that there were indeed shocks in 1997, 1998 and 1999, with significant negative influence for regional environmental budgets. With the inclusion of these shocks in the analysis, the results also show a remarkable change in the significance of two main variables, GDP and unemployment, with the former becoming not statistically significant and the later becoming significant, with a very small coefficient but with a positive sign. The exchange of significance of these two variables is not so striking if we take into account that they are heavily and negatively correlated, so the improvement in the explanatory quality of the model makes unemployment take its place instead of a more generic variable as GDP, but to some extent they contradict Hicks and Swank (1992) results as for them both variables would be significant. With regard to the positive sign, this could hypothetically be showing a green budgeting type of approach, with an increase in unemployment leading to an increase on environmental budget at regional level, indicating a better management of environmental budgets. Due to the short period of time in this study it is not possible to make that statement categorically and in order to assess this properly it would be necessary to check the maintenance of this behaviour in the long term, which is not possible due to lack of data.

Interestingly, political variables at regional level keep being positively significant when the regional government acts with majority, but at national level things change with the case of a socialist government in minority being the only significant one in a negative way, contradicting the initial result. This could be a punctual case that due to lack of data for other periods cannot be generalised, but it could make reference to the only period under study (1995) where the lack of support for the national budget approval from nationalist parties made that the governing socialist party (in minority) could not finish the legislative period and had to celebrate elections ahead of schedule (Inter-Parliamentary Union, 1996). This is not a surprising outcome given the complicated and sometimes confronted relationship between the national and regional governments in Spain (Field, 2014).

With regard to the identified time shocks, they take place during the first conservative central government (1996–2000) after a long period of socialist governments (1982–1996). It is considered a politically stable period where the government in minority counted on the support of the nationalist parties, with 1997 being the first complete year of conservative national budget, and particularly

the year in which an important fiscal reform was approved, affecting to sectors as significant as the pensions system (Bonin, Gil, & Patxot, 2001) and the labour market (Mendez, 2008). In 1998, the continuation of economic reforms in the light of European recommendations for market liberalisation saw how laws related to the hydrocarbons or tobacco sectors were approved, as well as the liberalisation of the telecommunications market, which became effective in 1999 (OECD, 2000, 2001). With unemployment being one of the main problems of the Spanish economy, it would not be unexpected that more changes in this area were introduced, and precisely in 1999 the National Employment Plan was approved (Mendez, 2008).

It seems under these conditions that the “shocks” had to do with key economic measures taken at national level in sectors important enough as to justify a decrease on environmental expenditure at regional level. This is consistent with Baumgartner et al. (2006) approach, focusing on the perception of different levels of importance in the variables that influence political behaviour to choose among priorities in public budget.

Due to the reduced period with availability of data, the possibility of adding a lagged dependent variable has been ruled out, but the robustness of the results has been verified clustering the standard errors by region, with results shown in column (4) of Table 3, only confirming the validity of the analysis.

5. Conclusions

All in all the results obtained are consistent with the Spanish situation in the period under analysis but this indicates that Spain was not applying a green economy or green budgeting approach before the crisis and it is not expected that it will do so in the nearest future, contrary to the position advocated by European and international institutions (UNEP, 2009 or EEA, 2014 for instance), and despite the potential opportunities for employment creation. So, the perception of Spain as a frontrunner in the environmental area up to recent times is in fact misleading. The fiscal advantages approved for the renewable energy sector at an early stage may have given a temporary image of success and it is true that Spain has the second largest capacity installed of solar energy in Europe after Germany but the recent reforms are making that advantage disappear quite quickly, since they disincentive investments (Del Rio & Mir-Artigues, 2014).

In most of the tests, both environmental tax revenues and the European funding variables appear to be non-significant. This could be an indication of two possible problems in the Spanish economy: (1) The Structural Funds received from the European Union haven't been allocated efficiently. (2) Environmental concerns haven't been integrated properly in the fiscal cycle (no green budgeting).

The first issue has already been dealt with by the literature (Farrell, 2004) with a confirmation that the focus of the Structural Funds in the Spanish case on infrastructures instead of human capital investment (comparing its case with Ireland) did little to help in the areas of regional integration and unemployment, which we have already pointed out as two main structural problems of the country.

The second issue suggests the lack of a green budgeting approach, specifically in the years prior to the crisis, but this is also a reflection of the historical preferences for policy areas of priority. It has already been mentioned that competencies in the environmental area are not exclusive for national or regional governments and they are not even mentioned as main area of transfers of competencies. If we look at the proportion that environmental budget represents on the total national budget it can be concluded that it hasn't been an issue of great interest at political and budgetary levels. However, it cannot be said at this point that this is an indication of politicians not taking into consideration citizens priorities to manage their budgets. Data coming from national official surveys confirm, for the period under study, is that environment and energy were not among the priority issues that Spanish citizens were concerned about (Chaquez & Palau, 2011). In fact, from 1994 onwards the Spanish regions started receiving big amounts of structural funds dedicated to environmental projects, which may have created the perception that no more funding was required and sufficient

action was being taken (Torgler & Garcia-Valiñas, 2005). However, this poses questions as to why the EU funding variables have appeared as non-statistically significant. It is understandable in this case that politicians in general and governments in particular haven't been integrating environmental issues in other policies in a substantial way, since they haven't felt pushed in that direction by the majority of voters.

Though quantitative results cannot be considered conclusive at the national level of analysis, political variables seem to play a role at regional level and the differing sign of parties in power at regional and national level appear also as significant in some cases, which would be consistent with results shown for other countries (Russel & Benson, 2014).

All these results so far seem to indicate flaws in the decision-making process to allocate budget efficiently for a sustainable growth path. Structural reasons related to internal organisation and high level of unemployment, apart from lack of public consciousness towards environment, seem to be behind this behaviour.

Funding

The author received no direct funding for this research.

Author details

Rosa Maria Fernandez¹

E-mail: r.fernandez@chester.ac.uk

ORCID ID: <http://orcid.org/0000-0002-0444-7999>

¹ Department of Social and Political Science, University of Chester, Westminster Building CWE110, Parkgate Road, Chester CH1 4BJ, UK.

Citation information

Cite this article as: Interactions of regional and national environmental policies: The case of Spain, Rosa Maria Fernandez, *Cogent Economics & Finance* (2018), 6: 1442092.

References

- Alonso-Sanz, I. (2010, March). Spanish decentralization and the current autonomous state: A budgetary view (No. 72). *International Journal of Public Budget*. Retrieved June 30, 2014, from <http://www.asip.org.ar/en/content/spanish-decentralization-and-current-autonomousstate-budgetary-view>
- Ballart, X., & Zapico, E. (2010) Budget reforms in Spain. In J. Wana, L. Jensen, & J. de Vries (Eds.), *The reality of Budgetary Reform in OECD Nations. Trajectories and Consequences* (pp. 240–259). London: Elgar.
- Baumgartner, F. R., Foucault, M., & François, A. (2006). Punctuated equilibrium in French budgeting processes. *Journal of European Public Policy*, 13(7), 1086–1103. <https://doi.org/10.1080/13501760600924191>
- Boletín Oficial del Estado. (1978, December 29). *Constitución Española* (BOE No. 311).
- Bonin, H., Gil, J., & Patxot, C. (2001). Beyond the Toledo agreement: The intergenerational impact of the Spanish Pension Reform. *Spanish Economic Review*, 3, 111–130. <https://doi.org/10.1007/PL00013590>
- Casal Bertoa, F., Ferrin, M., & Pardos-Prado, S. (2010). Chapter 27. Spain. In W. Gagatsek (Eds.), *The 2009 elections to the European parliament. Country reports*. European University Institute.
- Chaqués, L., Monpetit, E., Palau, A. M., & Munoz, L. (2012). Divergence and convergence of policy priorities among sub-national units in federal systems: The cases of Canada and Spain. *Perspectives on Europe*, 42(2), 14–21.
- Chaqués, L., & Palau, A. M. (2011, July). Assessing the responsiveness of spanish policymakers to the priorities of their citizens. *West European Politics*, 34(4), 706–730.
- Chislett, W. (2012). Elections in Spain: A political change in the framework of a major international crisis. *Panorama. Mediterranean Politics: Europe. Med*, 2012, 149–152.
- Clark, T. S., & Linzer, D. A. (2015). Should i use fixed or random effects? *Political Science Research and Methods*, 3(2), 399–408. <https://doi.org/10.1017/psrm.2014.32>
- Coats, C. (2014). Spain deals another blow to renewable power. *Forbes*. Retrieved July 10, 2014, from <http://www.forbes.com/sites/christophercoats/2014/06/12/spain-deals-another-blow-to-renewable-power/>
- Council of the European Union. (2013, June 20). *Council recommendation with a view to bringing an end to the situation of an excessive government deficit in Spain* (10560/1/13 REV 1 (en)). Brussels.
- Del Rio, P., & Mir-Artigues, P. (2014, February). A cautionary tale: Spain's solar PV investment bubble. *International Institute for Sustainable Development*.
- Economics for Energy. (2013) *Impuestos energetico-ambientales en España*. Informe.
- European Commission. (2008, June 26). *EU cohesion policy 1988–2008: Investing in Europe's future*. InfoRegio Panorama.
- European Environmental Agency. (2014). *Resource-efficient green economy and EU policies* (EEA Report, No 2/2014). Denmark.
- European Environmental Agency. (2013, May 14). *Press release – Green fiscal reform can create jobs and stimulate innovation across the EU*. Retrieved July 9, from <http://www.eea.europa.eu/highlights/fiscal-reform-can-create-jobs>
- European Environmental Agency. (2011, September 16). *Press release – Green budgets: The potential for economic instruments to power environmental change*. Retrieved July 9, 2014, from <http://www.eea.europa.eu/highlights/green-budgets-the-potential-for>
- European Renewable Energy Council. (2013). *EU tracking roadmap 2013. Keeping track of renewable energy targets towards 2020*.
- Eurostat. (2014, June). *Statistics explained. Environmental protection expenditure*. Retrieved November 10, 2014, from http://epp.eurostat.ec.europa.eu/statistics_explained/
- Farrell, M. (2004). Regional integration and cohesion – Lessons from Spain and Ireland in the EU. *Journal of Asian Economics*, 14(6), 927–946. <https://doi.org/10.1016/j.asieco.2003.09.004>
- Field, B. N. (2014). Minority parliamentary government and multilevel politics: Spain's system of mutual back scratching. *Comparative Politics*, 46(3), 293–312. <https://doi.org/10.5129/001041514810943090>

- Greene, W. H. (2008). *Econometric analysis* (6th ed.). Upper Saddle River, NJ: Prentice Hall.
- Held, A., Ragwitz, M., Huber, C., Resch, G., Faber, T., & Vertin, K. (2007, October). Feed-in systems in Germany, Spain and Slovenia – A comparison. *Fraunhofer Institute Systems and Innovation Research*.
- Hicks, A. M., & Swank, D. H. (1992, September). Politics, institutions, and welfare spending in industrialized democracies, 1960–82. *American Political Science Review*, 86(3), 658–674.
<https://doi.org/10.2307/1964129>
- HM Treasury. (2013, July). Public expenditure. *Statistical Analyses* (Cm 8663).
- Instituto Nacional de Estadística. (n.d.). *Environmental protection expense accounts. Series 1995–2001*. Retrieved April 2013, from <http://www.ine.es/jaxi/menu.do?type=pcaxis&path=%2Ft26%2Fp067&file=inebase&L=1>
- Inter-Parliamentary Union. (1996). *Spain: Elections held in 1996. Historical archive*. Retrieved August 4, 2014, from http://www.ipu.org/parline-e/reports/arc/2293_96.htm
- Jones, S. (2016, June 27). Spanish elections: Renewed deadlock beckons as no party wins majority. *The Guardian*. Retrieved June 30, 2016, from <https://www.theguardian.com/world/2016/jun/26/spanish-elections-exit-polls-show-deadlock-likely-to-continue>
- Magadan Diaz, M. (2008). *Imposición verde y financiación autonómica. Evolución y estructura territorial*. Universidad Nacional de Mar del Plata. Facultad de Ciencias Económicas y Sociales. Repositorio. Retrieved October 29, 2013, from <http://eco.mdp.edu.ar/cendocu/repositorio/00841.pdf>
- Mandl, U., Dierx, A., & Ilzkovitz, F. (2008, February). *The Effectiveness and efficiency of public spending*. *European Economy* (Economic Papers 301). European Commission.
- Mendez, I. (2008, June). *Promoting permanent employment: Lessons from Spain* (CEMFI Working paper 0810). CEMFI. Retrieved August 6, 2014, from <ftp://ftp.cemfi.es/wp/08/0810.pdf>
- Mendoza, A. I. (2015). *El real decreto de autoconsumo eléctrico o la paradoja de pagar por generar energía*. Noviembre: Análisis Gómez Acebo & Pombo.
- Ministerio de Economía y Hacienda. (1995–2011). *Presentación del Proyecto de Presupuestos Generales del Estado 1996–2012*.
- Ministerio de Hacienda y Administraciones Públicas. (2012–2014). *Presentación del Proyecto de Presupuestos Generales del Estado 2013–2015*.
- Mogues, T. (2012). *What determines public expenditure allocations? A review of theories, and implications for agricultural public investment* (IFPRI Discussion Paper 01216). International Food Policy Research Institute.
- OECD. (2000). *Regulatory reform in Spain: Regulatory reform in the telecommunications industry*. Paris: Author.
- OECD. (2001). *Regulatory reform in Spain: The role of competition policy in regulatory reform*. Paris: Author.
- OECD. (2010, May). *Medium-term management of green budgets: The case of Ukraine*. Paris: Author.
- OECD. (2012). *OECD economic surveys: Spain 2012*. Paris: Author.
- Official Journal of the European Union. (2009, June 5). Directive 2009/28/EC of the European parliament and of the council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.
- Official Journal of the European Union. (2013, June 26). Council recommendation of 21 June 2013 with a view to bringing an end to the situation of an excessive government deficit in Spain. 2013/C 180/2. Brussels.
- Pearce, D., & Palmer, C. (2001). Public and private spending for environmental protection: A cross-country policy analysis. *Fiscal Studies*, 22(4), 403–456.
- Perman, R., Ma, Y., Common, M., Maddison, D., & McGilvray, J. (2011). *Natural resource and environmental economics* (4th ed.). Pearson.
- Russel, D., & Benson, D. (2014). Green budgeting in an age of austerity: A transatlantic comparative perspective. *Environmental Politics*, 23(2), 243–262.
<https://doi.org/10.1080/09644016.2013.775727>
- Sanz, I., & Velazquez, F. J. (2003). *Fiscal illusion, fiscal consolidation and government expenditure composition in the OECD: A dynamic panel data approach* (European Economy Group Working Paper 21/2003). Universidad Complutense de Madrid. Retrieved November 10, 2014, from <http://pendientedemigracion.ucm.es/info/econeuro/documentos/documentos/dt212003.pdf>
- Snyder, J. M., & Yackovlev, I. (2000, April). *Political and economic determinants of government spending on social protection programs*. Cambridge, MA: Massachusetts Institute of Technology.
- Solé-Ollé, A., & Sorribas-Navarro, P. (2008). The effects of partisan alignment on the allocation of intergovernmental transfers. Differences-in-differences estimates for Spain. *Journal of Public Economics*, 92, 2302–2319. <https://doi.org/10.1016/j.jpubeco.2007.06.014>
- Soukopova, J., & Bakos, E. (2013). *Environmental protection expenditure: Ex-post evaluation* (Working Paper WP KVE 08/2013). Masaryk University. Faculty of Economics and Administration.
- Statistics Finland. (2014) Public sector environmental protection expenditure 2012. *Environment and Natural Resources*.
- Swidlicki, P., Ruparel, R., Persson, M., & Howarth, C. (2012). Off target: The case for bringing regional policy back home. *Open Europe*.
- Torgler, B., & Garcia-Valiñas, M. A. (2005, September). The determinants of individuals' attitudes towards preventing environmental damage. *Nota di lavoro* 110.2005. Fondazione Eni Enrico Mattei.
- Tridimas, G. (2001). The economics and politics of the structure of public expenditure. *Public Choice*, 201, 299–316.
<https://doi.org/10.1023/A:1005250716104>
- UNEP. (2009). *Global green new deal*. Policy Brief: United Nations Environment Program.
- UNESCAP, ADB, UNEP. (2012). *Green growth*. UN Economic and Social Commission for Asia and the Pacific.
- Wilkinson, D., Benson, D., & Jordan, A. (2008). Green budgeting. In A. Jordan & A. Lenschow (Eds.), *Innovation in environmental policy? Integrating the environment for sustainability* (pp. 70–92). Cheltenham: Edward Elgar.



© 2018 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

Share — copy and redistribute the material in any medium or format

Adapt — remix, transform, and build upon the material for any purpose, even commercially.

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made.

You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



***Cogent Economics & Finance* (ISSN: 2332-2039) is published by Cogent OA, part of Taylor & Francis Group.**

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com

