GOVERNMENT SOCIAL SPENDING AND GDP: HAS THERE BEEN A CHANGE IN SOCIAL POLICY?

Jesús Clemente
Carmen Marcuello
Antonio Montañés

Universidad de Zaragoza

ABSTRACT

Government Social Spending is made up of a very heterogeneous range of variables, such as monetary transfers for retirement or illness, unemployment benefits, family services, active labour market policies and health expenditure. We believe that each of these components is of enormous importance to the economic development of a country. As has often been affirmed, however, Government Social Spending is one of the most sensitive economic aggregates to the ups and downs of economic growth. In moments of crisis, sharp cuts are almost immediate, but these may or may not be recovered when times are good. In this paper we examine the sensitivity of Government Social Spending and the evolution of GDP in order to confirm or otherwise the relationship between the two.

Keywords: Government Social Spending, GDP, changes in social policy.

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Adress contact:
Jesús Clemente,
Dpto. Análisis Económico, Universidad de Zaragoza
Gran Vía, 2.
50005, Zaragoza (Spain)
e-mail: clemente@unizar.es

1. Introduction

In the European context, it has been argued on not a few occasions that Government Social Spending is very high and should be constrained or reduced. For example, countries such as France and Germany are under pressure from both the European Union and their own economic situation to reduce Government Social Spending. The indebtedness of these countries threatens compliance with EU monetary stability requirements, while both the effectiveness and the sustainability of the welfare state have been questioned. As a result, both countries have been obliged to address possible reductions in Government Social Spending in order to maintain the stability pact, resulting in the announcement of cuts in pension systems and, in general, in different components of Government Social Spending. This situation is not new, since many other developed nations running a welfare state have already found themselves engaged in similar processes, and it may therefore be of interest to examine the response of the different governments in a crisis context.

The current situation is indeed very similar to that of any country finding itself in a moment of crisis in the relatively recent past, where the resort to economic measures based on the constraint of the public deficit by lowering Government Social Spending has been a common policy. In fact, social expenditure is usually the prime target of proposals to solve the problems associated with fiscal imbalances, despite its recognised importance for the welfare of different groups among the population.

The issue is important from various points of view. In the first place, it may provide evidence for or against the various theories on which policies have been based. For example, Kittel and Obinger (2003) examine these theories (race to the bottom, old politics, the new logic of politics, match-up and the new politics approach) in light of the various elements defining social policy, which embrace issues such as convergence, economic growth and the behaviour of political parties in times of crisis. The authors find no conclusive evidence in favour of any of these theories. Secondly, as both Kittel and Obinger (2003) and Fic and Ghate (2005) argue, the golden age of the welfare state in the western economies appears to have reached its end some time around 1990. Unquestionably, the crisis of the 1990s ushered in sharp cuts in Government Social Spending that have not been reversed in the following period of expansion. In this context, a rigorous statistical analysis is necessary to obtain results allowing comparison

with the situation underlying the current debate. Thirdly, there is the question of the relationship between social expenditure and national income or production (Herce et al. 2000, Herce et al. 2001, Herce et al. 2003, Auteri and Costantini, 2004, Wahab, 2004, Bellettini and Berti, 2000, Fic and Ghate, 2005). This matter of the effects of Government Social Spending on growth, and the analysis of causality, provide significant insights into the outcomes of different policy approaches (Arjona et al., 2002 provide an excellent review of empirical work in this area). Herce et al. (2001) examine the issue of causality in depth, finding evidence to support a demand-based theory which states that it is the evolution of incomes that drives the behaviour of social expenditure. Thus, income elasticity is found to be one of the key factors for the analysis of the behaviour of this expenditure in a context where elasticity may actually have changed due to policy shifts in the countries concerned.

In this light, it is important to consider the evolution of social expenditure, and in particular the part excluding health spending[1] which, unlike Government Social Spending, has already been sufficiently studied in its own right. We propose to undertake this analysis using an approach that includes recent contributions in the context of cointegration. This allows for changes in the parameters to take place endogenously in a selected time period due to the procedure. In this way, it becomes possible to detect changes in the behaviour of the variable analysed or, to put it another way, the analysis focuses on the possibility of a shift in the paradigm underlying the evolution of Government Social Spending.

We take a demand-based approach, seeking to analyse how Government Social Spending responds at different income levels. Thus, if the double logarithmic specification is applied, the parameter estimated will represent the income elasticity of Government Social Spending. In this context, it may be interesting to ask whether Government Social Spending is a normal good (a luxury or primary necessity depending whether elasticity is greater or less than one, but always positive) or an inferior good. The underlying issue here is that the welfare state has actually grown considerably in western countries. Thus, it is possible that the services it provides are close to saturation in some countries, in which case the sensitivity of this type of expenditure to variations in income will probably have declined significantly. This means that Government Social Spending could be considered a luxury good in a lower-

[1] Auteri and Costantini (2004)

income nation, resulting in a major effort to cover this need. As the need is covered and gradually comes to be taken for granted, however, perceptions may change, and it may come to be seen as a primary need. Finally, perceptions of the problems associated with the funding of the welfare state and a change in the approach taken may cause these services gradually to be seen as an inferior good. To sum up, taking a demand-based approach we seek in this paper to provide evidence in support of such changes in national preferences as part of our analysis of income elasticity.

2. Government Social Spending: a descriptive analysis.

From a political, social and economic point of view, we may identify four basic welfare state models in Europe. These four models may be extended by the countries of central and Eastern Europe when it eventually becomes clear whether they will develop their own model or adopt one of those already existing, or the Japanese model. Scheepers et al. (2002) and Buhigas-Schubert and Martens (2005) define the following models: (1) the Nordic welfare state model represented basically by Sweden, Norway, Iceland, Denmark and Finland, in which we find a universal benefits system; (2) the Anglo-Saxon model, which include the United States, the United Kingdom, Canada, Ireland and Australia and is based on a selective welfare state; (3) the Continental/Conservative model representing the more interventionist system applied in Germany, Austria, France, Belgium and the Netherlands; and (4) the Southern European model comprising Spain, Greece, Italy and Portugal, which is sometimes included in the Continental model, although it presents different common characteristics. Finally, there is the Japanese social policy model, which differs from the others and includes greater involvement on the part of business[2].

This paper focuses on public social expenditure excluding health outlays. There are various reasons for this. In the first place, health spending has already been exhaustively analysed in numerous papers, and it would be redundant to reproduce this work here. Secondly, health expenditure is associated with processes for the accumulation of human capital (Strulik, 2004, Rivera and Currais, 2004), while social spending policies are implemented in tandem with the accumulation of social capital (Rothstein and

[2] Nevertheless, it is the case that the term social spending or social policy covers a wide range of forms and decisions proper to each country and the particular circumstances of the beneficiary groups. Consequently, any analysis of the components of social spending must take into account the possibility of significant differences, and comparisons can only be made with caution (Adema, 2001).

Stolle, 2002; Clemente et al., 2005; Kumlin and Rothstein, 2005). Consequently, the sensitivity of these two costs to changes in income may differ from the standpoint of both individual decisions (private spending) and collective policy, given that politicians generally recognise that health spending influences economic growth, but social expenditure has not yet been taken up in political debate in these terms. Finally, we may mention the recent debate concerning the sustainability of the welfare state in the western economies, both from the financial standpoint and in terms of the incentives provided to economic agents in a given society.

In the first place, we may note the wider range observable in the intensity of spending in different countries represented as the percentage of GDP applied to social policy. Figure 1 shows this percentage for different countries in three period, 1908, 1990 and 1998 (we have used the 2000 OECD database). The first point of note is the heterogeneity of the percentages reflected. Thus, the percentages for the non-European and Southern European nations are significantly lower, in particular as compared to the Nordic countries. This corroborates the existence of different social protection systems as defined in Scheepers et al. (2002).

Furthermore, in the countries with high levels of social protection, the Chart reveals a peak around 1990 with a clear drop thereafter. The only exceptions are the Netherlands, which had already made a cut in 1990, and Germany, where an opposite movement is apparent, which is to say a fall in 1990 with a subsequent rise in 1998, almost certainly associated with the process of re-unification.

The behaviour of countries with lower levels of protection differs substantially. While a certain stability is visible in the non-European countries, the nations of Southern Europe follow two distinct patters. Thus, the profile in Spain and Italy is similar to the rest of Europe, but in Portugal and Greece Government Social Spending continued to rise.

In short, the pattern is mixed, but in general terms the 1990s saw a contraction in Government Social Spending, excluding Government Health Expenditure, measured as a percentage of GDP, except in certain Southern European countries with already low levels of social protection and in Germany.

In this context, it may be of interest to consider the dynamic evolution of this percentage. Figures 2 and 3 present the data for a set of countries in order to illustrate the differentiated pattern described above. For example, in Chart 2, the Netherlands

displays a downward trend in the early years, becoming more or less stable in 1990s. The profile of Finland, on the other hand, is completely different, beginning with slow growth and then stabilizing, while in Germany the pattern is stable in the early years but subsequently takes an upward path.

Something similar may be observed in the countries with the lowest percentage Government Social Spending, shown in Chart 3. Thus, the US pattern does not appear to change, the trend in Greece is upward, and a change may be observed in Spain beginning with the crisis occurring in the 1990s.

This simple graphic analysis, then, illustrates the heterogeneity of Government Social Spending measured in terms of GDP, both from the standpoint of the dynamic pattern over time and taking into account the size of the welfare state, clearly reflecting the importance of the local peculiarities of the countries included in the sample.

3. Data and methodology

3.1. The data.

The data employed in this study were obtained from the 2004 OECD Data Base, which is the commonly used in research of this nature and includes values for the period from 1980 through 1999. The countries included in the sample are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Portugal, Spain, Sweden, the United Kingdom and the United States. It would be possible to use a larger sample if only a part of social expenditure, namely transfer spending, were considered as in Fic and Ghate (2005). However, our standpoint is associated with total Government Social Spending, given that outlay in respect of employment and other active social policies are very significant in some nations, such as the Nordic countries. Consequently, while Fic and Ghate (2005) opted to expand the sample size despite the loss of a part of the Government Social Spending information, we have chosen the alternative of a smaller sample that includes the whole of Government Social Spending. Evidently both positions are open to criticism and represent alternative, yet complementary, points of view. This is all the more so considering that the empirical methodology employed in the two studies are actually very different.

3.2. Time series properties of the series: Unit root tests

This subsection analyses the time series properties of our data set, in special so far as the possible presence of unit roots is concerned. It is well-known that the presence of unit roots determines the most appropriate econometric methodology to be used. Thus, we should first test for the unit root null hypothesis in our series in order to determine the integration order of our variables. To that end, we could have followed a single approach in this regard and have applied the Dickey-Fuller family of tests, for example. However, given the characteristic of our sample, with just information of the last 20 years available, we have chosen to focus the analysis of the integration order of the variables on the use of panel data unit root statistics[3]. This approach has the advantage of providing statistics with better properties that the standard unit root statistics, in the sense of being more powerful and showing no significant size distortions.

Thus, following this strategy, we can extend the traditional Dickey-Fuller specification in such a way that adopts a panel data version:

$$\Delta y_{it} = \alpha_i \, y_{it-1} + \mathrm{W}_{it}^{'} \, \delta_i + \sum_{i=1}^{p_i} \phi_i \, \Delta y_{it-1} + u_{it} \qquad (1)$$

where i=1, 2, .., N and $\alpha_i=\rho_i$ -1. The parameter α_i, which contains information about the autoregressive parameter, can vary between the different cross sections of the sample, whilst W_{it} reflects the deterministic elements. Given the characteristics of the variables included in our data set, all the unit root statistics have been obtained from a specification that includes an intercept and a deterministic trend.

Althoguh we dispose of a number of possible statistics for testing the unit root null hypothesis, we will focus on that proposed in Im et al. (2003), which allows us to test for the null hypothesis H_o: $\alpha_i = 0$ for i = 1, 2, ..., N, against the alternative hypothesis that some series do not exhibit a unit root. This statistic is based on the Dickey-Fuller statistics for the single series. Let us denote the standard Dickey-Fuller statistic by $t_i(p_i)$, where i=1, 2, ..., N and p_i represents the number of lags used in each equation. Then, the IPS statistic is defined as follows:

[3] We should note that the techniques that we will employ across this paper are more related to pooled regressions than to pure panel data analysis, as it would be the case of the consideration of fixed effects, for example.

$$IPS = \frac{\sqrt{N}\left[\zeta - N^{-1}\sum_{i=1}^{N} \mathrm{E}\left(\mathrm{t}_{\mathrm{i}}(\mathrm{p}_{\mathrm{i}})\right)\right]}{\sqrt{N^{-1}\sum_{i=1}^{N} \mathrm{Var}\left(\mathrm{t}_{\mathrm{i}}(\mathrm{p}_{\mathrm{i}})\right)}} \qquad (2)$$

with ζ being the sample mean of the Dickey-Fuller statistics for the N cross-sections.. The expressions for the mean and variance of $t_i(p_i)$ are calculated in the referenced article for diverse cross-section and sample sizes. The statistic IPS converges towards an N(0,1) distribution, so the critical values of this distribution may be utilised.

The results that we have obtained from the application of this statistic are reported in Table 1. The inspection of this Table let us conclude that all the variables included in our data set are I(1). This fact has direct consequences on the estimation method that we applied as it made the use of traditional methods impossible. As is outlined below, we had to check that there is a cointegration relationship for each one of the variables.

We should note that in order to remove the possible distortions caused by the existence of a certain degree of cross-section correlation, we have also calculated the panel data unit root statistics once the cross-section mean has been removed. The results are also reported in Table 1 and we can also observe that there is no change in the conclusion about the integration order of the variables. Finally, we have also considered the Phillips-Perron version of the panel data unit root tests employed. The use of these statistics merely confirms the conclusion that we have drawn and, consequently, we have preferred to omit them.

3.3 Estimation of long term relationships: Panel data cointegration analysis.

Once we have offered evidence in favour the variables considered in this study to be better characterised as being I(1), then the next question to be examined is the existence of a long-run structural relationship between the Non-Health Social Expenditure and the GDP of a particular country. The initial model specification can be stated as follows:

$$\log \mathrm{SE}_{\mathrm{t}}^{\mathrm{i}} = \beta_{1i} + \beta_{2i} \log \mathrm{PIB}_{\mathrm{t}}^{\mathrm{i}} + \mathrm{u}_{\mathrm{it}} \qquad (4)$$

where the endogenous variable is the logarithm of Non-Health Social Expenditure of the country i in the period t, whilst the GDP of the i-th country in the period t is the explanatory variable.

In order to confirm that this specification may represent a valid long-run economic relationship, we should test for the non-cointegration null hypothesis by analysing the presence of a unit root in the perturbation of the preceding model. Again, we have adopted here a panel data perspective. To that end, we dispose of a relatively wide range of statistics, although our preferences are the group test defined in Pedroni (1999, 2004), which can be considered the panel data extension of the Engle-Granger statistics. Following this author, the statistics that we have used can be defined as:

$$PD = \frac{N^{-1/2}\,\tilde{Z}_{t_{N,T}} - \Theta\sqrt{N}}{\sqrt{\Psi}} \Rightarrow N(0,1) \qquad (5)$$

Where $\tilde{Z}_{t_{N,T}}$ is the mean group t-type statistic for testing the null hypothesis that the perturbation of the i-th model exhibits a unit root. We should recall that we can follow a parametric or a non-parametric approach in order to take into account the possible existence of autocorrelation in these perturbations. In the first case, we should calculate the statistics of the Dickey-Fuller family, whilst the Phillips-Perron statistics are obtained in the second. The values of the parameters $\Theta_{\cdot}$ and Ψ that controls the convergence of the statistics towards a Normal distribution depends on the number of explanatory variables included in the model specification. Pedroni (2004) reports their asymptotic approximations in Corollary 1.

However, it is possible that the earlier specification not to be enough to capture the relationship between Non-Health Social Expenditure and GDP. Here, we are thinking in terms of the existence of possible changes in the parameters of this model. For example, Clemente et al. (2004, 2005) offers evidence against the non structural break hypothesis when the relationship between total Health Expenditure and GDP of a group of the OECD countries is analysed. Thus, it seems to be sensible to admit the possible existence of a break in model (4). To do that, we can simply add some dummy variables to the previous specification in order to capture these changes. The new model specifications can be stated as follows:

$$\log \mathrm{GH}_t^i = \alpha_{1i} + \alpha_{2i}\log \mathrm{PIB}_t^i + \alpha_{3i}\mathrm{D}_t^i + \mathrm{u}_{it} \qquad (6)$$

when only a change in the intercept is considered or, more generally,

$$\log GH_t^i = \alpha_{1i} + \alpha_{2i}\log PIB_t^i + \alpha_{3i}D_t^i + \alpha_{4i}\left(D_t^i \log PIB_t^i\right) + u_{it} \quad (7)$$

when both the intercept and the slope changes. In the previous equations, D_t^i means a dummy variable that takes the value 1 for the variable I when t> TB^i, with TB^i being the period when the break changes.

In a recent paper, Banerjee and Carrión (2006) have defined a new family of panel data cointegration statistics that test for the non-cointegration null hypothesis when the specification model admits the presence of a structural change, as is the case of the models (6) and (7). Their proposal is based on an extension of the statistics designed in Gregory and Hansen (1996) for single series to the case of panel data. Banerjee and Carrión (2005) again propose a number of different statistics, following the papers of Pedroni (1999, 2004). However, we will only use those statistics that are based on mean group t-statistics, which can be defined in a similar way than that reported in (5), although the asymptotic values of the parameters Θ and Ψ change and are reported in the Table 4 of Banerjee and Carrión (2006).

Finally, we should note that we have considered the two above mentioned families of t-tests (Dickey-Fuller and Phillips-Perron) and that, in order to take into account for some forms of cross-sectional dependency, we have also obtained these statistics for the variables measured in differences with respect to the cross-section mean. The results that we have obtained are reported in Table 2.

The first column of Table 2 reports the value of the EG statistic for each model, as well as the mean group t-ratio (for the raw data and for the cross-section mean corrected data). The analysis of these group t-ratios cannot lead us to reject the non-cointegration null hypothesis for the system. Thus, if we finished the study at this point, we should conclude that there no exists evidence in favour of a long-run relationship between Non-Health Social Expenditure and GDP. However, we should note that we are considering the possibility of the parameters of this long-run relationship to exhibit a change across the sample size. If this change is included in the model specification, the rejection of the non-cointegration null hypothesis could change.

When we admit the presence of changes in the parameters of the model, the conclusions radically change. We can see that we can robustly reject the non-cointegration null hypothesis for the system when only a change in the intercept is considered, as well as

when the change affects all the parameters of the model. Thus, we can affirm that there exists a long-run economic relationship between Non-Health Social Expenditure and GDP for the group of countries considered, although this relationship changes across our sample size. The analysis of this economic relationship is the aim of the next Section.

4. International analysis of the relationship between Government Social Spending and GDP

Table 2 also reports the estimation of the parameters of the models employed to capture the relationship between Non-Health Social Expenditure and GDP for our group of countries. We should recall that we are considering three different specifications, represented by models (4), (6) and (7). In order to select the most appropriate model for each country, we have taken into account the t-ratios associated to the dummy variables, with these t-ratios having been obtained from the use of Fully-Modified estimation. Finally, we have divided the countries into four different blocks, as indicated in section 2 above, depending on the welfare system in place (Nordic, Anglo-Saxon, Continental or Latin, without considering Japan) in order to make easier the analysis of the results.. The inspection of the results reported in Table 2 allows us to draw the following conclusions.

First, all the countries admit the presence of a change in their particular cointegration relationship. The period when this break occurs is closely related to the beginning of 1990s, except for the cases of New Zealand and Ireland whose estimations of the breaking time is slightly earlier. Even more precisely, we can admit 1992 as the period where the break appears. This change has been documented in other papers referring to the public sector in general, such as Hansen and Stuart (2003), and it has also been associated with the crisis of the early 1990s and the argument that the public sector had grown too large. In any event, it might be asked whether the slimming down of the public sector has been achieved by cuts in the welfare state.

Table 2 also shows that the change has implied a significant reduction in the elasticity of Non-Health Social Expenditure to GDP in the Latin nations. Hence, we may affirm that there has been a reform of the welfare state, confirming our initial hypothesis that the current situation is not new, but has already occurred in earlier periods.

Another regularity that may be observed is that the countries exhibiting a decline in elasticity are generally those with higher elasticities prior to 1992. This evidence confirms a convergent trend in social policy at the level of the countries analysed. Furthermore, the change is so pronounced for the Netherlands that the elasticity estimated for the second half of the 1990s is actually negative, although we cannot reject that the final elasticity is different from 0. Thus, we should interpret with great caution and we can only affirm that this country exhibit a significant reduction in the response of Non-Health Social Expenditure.

With regard to the estimated values of the elasticities, an elasticity (β_3) of less than one was found prior to 1990 in only seven countries (the Denmark, Sweden, Ireland, USA, Belgium, Louxemburg and Netherlands), which confirms the hypothesis that Non-Health Social Expenditure was considered a luxury good for the majority of the countries considered. This situation changes completely after 1990. In this decade 13 countries exhibit an elasticity of less than one, while in Portugal elasticity declines sharply, and Japan is the only country whrere the elasticity grows. Hence, we may affirm, in general terms, that Non-Health Social Expenditure is becoming a primary need good (elasticity of less than one),

To sum up, the data provide evidence to support the existence of a change in the social policy implemented by Western governments, This change reveals a trend towards a cut-back in the welfare state in terms of a reduction in the sensitivity of expenditure of this kind to the evolution of national incomes, a phenomenon that could be associated with the perception that the services provided by the State have reached saturation.

5. Conclusions

The evolution of Government Social Spending indicates that periods of crisis have indeed ushered in policies aimed at constraining and even cutting expenditure in order to alleviate the public deficit. Furthermore, examination of Government Social Spending as a percentage of GDP in the OECD countries during the period 1980-1999 reveals a very mixed pattern. In this paper, we have analysed the evolution of Government Social Spending from a demand-based perspective. Thus, we have considered how income affects the amount of public funds earmarked for Government Social Spending and we have assessed the changes arising based on estimations of income elasticity. The methodology employed is based on cointegration relationships,

allowing evaluation of changes in the parameters of the models estimated and the detection of changes in the behaviour of the variable. By using a double logarithmic estimation, we were able to calculate the income elasticity of Government Social Spending and ask whether Government Social Spending is a normal or luxury good or a primary need.

The countries included in the sample were Australia, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, New Zealand, Portugal, Spain, Sweden, the United Kingdom and the United States, and the analysis focused on Government Social Spending excluding Government Healthcare Expenditure. This was because Government Healthcare Expenditure has already been the subject of numerous studies in the academic literature, and the approach allowed us to focus on the part of Government Social Spending that has received the least attention. The countries analysed were placed in five groups defined on the basis of the welfare models proposed by Scheepers et al. (2002), and Buhigas-Schubert and Martens (2005). In this way, we distinguished between countries applying the Nordic, Continental/Conservative, Anglo-Saxon and Southern European models, as well as Japan. Based on a descriptive analysis, the first point of note was the existence of considerable variation in the intensity of Government Social Spending in the different countries measured in terms of the share of GDP allocated. In the second place, the early 1990s saw a general round of spending cuts (again measured as a percentage of GDP) with the exception of certain Southern European nations and Germany.

Based on our estimates, five of the 18 countries analysed (Denmark, New Zealand, Ireland, France and Japan) did not exhibit any cointegration relationship between public Government Social Spending and GDP. This means that no evidence was found for a long-term relationship between the two variables, which suggests that policy decisions on Government Social Spending are not conditioned by the level of income in these nations. In the remaining countries, Government Social Spending and GDP were found to be cointegrated, and significant changes were observed at the beginning of the 1990s. The results thus indicate a change in social policy with a trend towards a reduction in the share of GDP represented by Government Social Spending, Southern European models. Based on the estimation of elasticity, meanwhile, we may affirm that Government Social Spending was considered a luxury good, in general terms, prior to

the 1990s. From 1990 onwards, however, it came to be seen as a primary need good though it continued to behave as a luxury good in some countries.

To sum, we may affirm that a significant change in the social policy of various developed nations occurred in the early 1990s, and the current situation therefore does not seem in any way new in this regard. This question should be a matter of concern for the citizens of countries with low levels of social protection, because the likely cuts will be made at lower levels of provision. For example, the reduction in the income elasticity of the Southern European nations represents a backward step in the process of convergence towards the system of social provision enjoyed by other countries, as in Nordic. In these countries, the situation appears brighter, because the social protection system covers practically all needs and if the current situation is maintained, services are unlikely to be reduced.

Let us end by pointing out some issues that may be of interest to extend the analysis presented here. In the first place, it would be worth considering the role of the private sector in the provision of services in countries with low levels of social protection and to compare private delivery with the corresponding public sector spending in countries with higher levels of protection. In the second place, it would be interesting to investigate the links between Government Social Spending and social capital as a driver of economic growth in more detail, which would mean examining the social policy mechanisms associated with this triple relationship. Finally, the present analysis should be repeated as and when a wider range of data becomes available.

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Table 1. Testing for panel data unit roots

		Non-Health Government Social Expenditure	PIB
		Testing for the null Hypothesis I(1) vs I(0)	
IPS:	Raw	1.73	-0.73
	Cross-sec.corre.	*13.23*	*5.73*
		Testing for the null Hypothesis I(2) vs I(1)	
IPS	Raw	-8.83[a]	-5.08[a]
	Cross-sec.corre	*-8.85[a]*	*-4.31[a]*

This table reports the IPS statistic for testing the panel data unit root null hypothesis. All the specification includes an intercept and a deterministic trend. The values presented in italic having obtained after removing the cross-section mean in order to take into account the possible autocorrelation of the perturbations of the models.
[a] means the rejection of the null hypothesis for a given 1% significance level.

Table 2. Cointegration Analysis and Estimation.

Countries	EG	GH-I	TB	GH-II	TB	β_1	β_2	β_3	β_4
Denmark	-1.77	-3.69	1991	-4.24	1991	3.12 (1.77)	0.18 (0.03)	0.66 (0.13)	
Finland	-2.24	-3.36	1989	-4.36	1992	-12.22 (1.70)	24.20 (2.26)	1.91 (0.15)	-2.07 (0.20)
Sweden	-1.68	-3.02	1988	-4.51	1992	7.22 (2.47)	0.25 (0.17)	0.39 (0.07)	
Australia	-1.11	-4.30	1992	-4.45	1992	-6.49 (1.62)	0.28 (0.05)	1.31 (0.08)	
Canada	-2.74	-3.85	1989	-4.29	1993	-9.29 (2.61)	18.96 (4.05)	1.53 (0.19)	-1.38 (0.30)
Ireland	-1.55	-3.54	1984	-3.20	1984	3.81 (1.26)	0.47 (0.11)	0.43 (0.11)	
New Zealand	-1.86	-4.20	1987	-3.93	1988	-8.60 (1.90)	14.85 (2.00)	1.58 (0.17)	-1.29 (0.18)
United Kingdom	-2.51	-4.02	1999	-4.51	1995	-4.49 (1.31)	-0.08 (0.17)	1.20 (0.10)	
USA	-2.65	-4.20	1991	-4.32	1991	4.79 (0.80)	0.15 (0.05)	0.54 (0.05)	
Belgium	-2.26	-4.84	1991	-4.77	1992	1.81 (0.90)	0.14 (0.02)	0.72 (0.07)	
France	-2.34	-3.34	1984	-2.98	1994	-13.88 (1.94)	15.64 (4.30)	1.88 (0.14)	-1.11 (0.31)
Germany	-1.10	-5.62	1992	-5.82	1992	-5.58 (1.14)	0.05 (0.03)	1.27 (0.08)	
Luxembourg	-1.98	-4.85	1992	-4.84	1992	0.68 (0.21)	0.11 (0.02)	0.74 (0.02)	
Netherlands	-0.63	-3.84	1989	-6.39	1990	6.61 (1.24)	6.91 (1.42)	0.35 (0.10)	-0.54 (0.11)
Switzerland	-0.43	-4.05	1992	-4.09	1992	-14.98 (3.15)	0.34 (0.25)	2.01 (0.25)	
Greece	-2.52	-4.56	1984	-4.94	1992	-39.56 (6.04)	29.83 (6.90)	4.28 (0.53)	-2.59 (0.60)
Italy	-3.12	-4.97	1991	-5.25	1992	-8.21 (1.07)	6.48 (2.03)	1.46 (0.08)	-0.46 (0.15)
Portugal	-0.17	-5.42	1992	-5.39	1992	-10.29 (0.75)	0.21 (0.07)	1.70 (0.07)	
Spain	-2.42	-3.00	1998	-5.22	1992	-7.59 (0.66)	13.00 (1.07)	1.43 (0.05)	-0.98 (0.08)
Japan	0.40	-2.95	1996	-4.24	1995	-7.47 (1.40)	-70.92 (0.07)	1.24 (0.07)	3.55 (0.66)
Group mean t-ratio									
Raw data	5.22	-2.13[a]		-5.50[a]					
Cross-sec.corrected	*-0.97*	*-4.07[a]*		*-3.47[a]*					

This table reports the different statistics that we have employed for testing the no-cointegration null hypothesis, as well as the estimation of the most appropriate model that captures the relationship between the Non-health Social Expenditure analysed in this Table versus the GDP. Column EG reports the value of the Engle-Granger statistic for each single series. Similarly, GH-I and GH-II reflects the Gregory- Hansen statistics for testing the non cointegration null hypothesis for the level shift and for the changing slope cases, respectively, with TB being the estimation of the period where the break occurs. β_1- β_4 are the fully-modified estimations of the parameters of model, with their respective standard errors reported into parenthesis. Finally, the group mean t-statistics are the Pedroni and the Banerjee-Carrión statistics for testing the panel data unit root null hypothesis, with the values in italic having been obtained after removing the cross-section mean in order to take into account the possible correlation of the perturbations.

[a] means the rejection of the panel data unit root null hypothesis for a given 1% significance level.

Figure 1: Social public expenditure without health as pertentaje of GDP

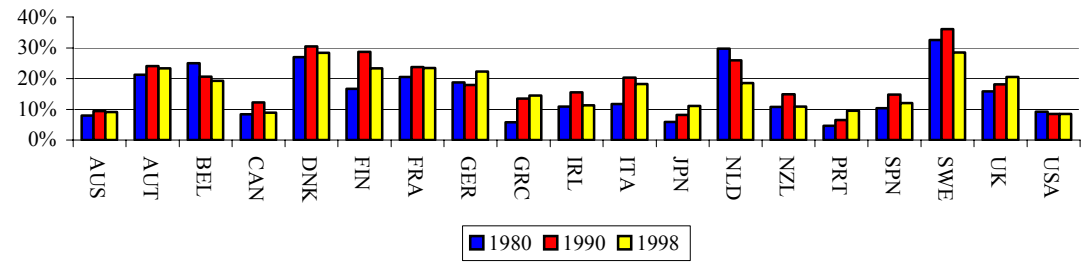

Figure 2: Evolution of social public expenditure without health as pertentaje of GDP

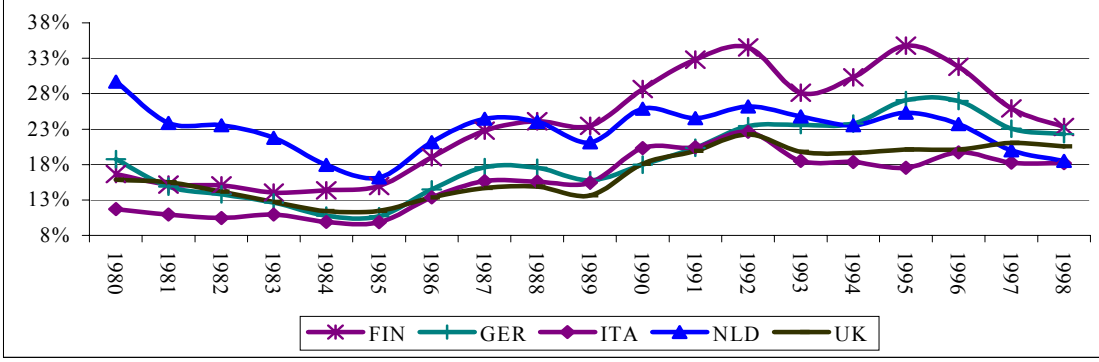

Figure 3: Evolution of social public expenditure without health as pertentaje of GDP