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Clustering European Welfare Systems through a Performance Index

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Abstract

We construct a composite performance indicator to assess the relative performance of welfare policies in the EU countries. We show that the variability of performances cannot be explained only by the amount of resources devoted to social policies, but also by the composition of social expenditure: countries with higher shares of redistributive public expenditure obtain better results in the social sector. This result confirms the association between the type of welfare system, according to the traditional four-way classification, and the performance level. However, considering a more complete set of indicators of the structure of the welfare systems, we find that European countries cannot be grouped according to the traditional classification. Considering expenditure-side indicators and financing-side indicators together, three groups form: one comprising the UK and Iceland, one the Nordic countries and the Netherlands, one the continental (and southern) countries and Ireland.

1. Introduction

Four welfare models are typically identified In the European Union (although they are less clearly demarcated than in the past): the Scandinavian model, which traditionally allocates a large amount of resources to predominantly universal welfare policies (around 32% of GDP in Denmark, Finland and Sweden), the continental model (Austria, Belgium, France, Germany and Luxembourg) with an intermediate level of expenditure of 29% of GDP, the Anglo-Saxon model in Ireland and the United Kingdom with selective social policies and expenditure levels of just over a quarter of GDP and, finally, the Mediterranean countries (Italy, Spain, Greece and Portugal), which in the 2000s allocated less than a quarter of GDP to welfare and which over the last few years have modified their welfare policies, allocating between 26 and 29% of GDP to the social sector in 2011.

These different welfare systems have been extensively analysed in the socio-economic literature from various perspectives that have highlighted the qualitative and quantitative differences between them (Titmus, 1974; Esping Andersen, 1990; Rhodes 1996; Goodin *et al*, 1999; Bertola *et al*, 2001; Arts and Gelissen (2002); Zoli 2004; Ferrera, 1996 and 2012, Ferrera et al, 2000; Hudson and Kuhner, 2012).

This paper performs a comparative analysis of welfare systems in 19 European countries focussing on the outcomes of social policies. To this end, OECD and Eurostat data from 2011 (the last year for which it is possible to construct a complete dataset) are used in relation to eight areas of social expenditure (families, health, the elderly, unemployment, poverty, the labour market and redistribution). For each area of welfare, and on the basis of the policies that it includes, outcome indicators are identified as proxies for the objectives of the policies themselves.

Following the methodology proposed by Tanzi and Schuknecht (2007), the paper constructs a composite performance indicator for the social sector of the

countries considered, which is then compared to net public social expenditure (i.e. net of fiscal interventions – tax levies and benefits –implemented by the various States). From the analysis, a certain variability emerges which is not linked to expenditure levels, which in turn exhibit less variability between countries in net terms. In contrast, the correlation between performance and social expenditure is more marked for subgroups of countries (for example for a number of countries belonging to the continental system – France, Belgium and Germany, which are joined by Ireland). The analysis suggests, first of all, the need for a policy of rationalisation of social expenditure, as opposed to a policy of expanding social expenditure in countries with a lower level of social expenditure (for example the Mediterranean countries).

The paper is structured as follows. Section 2 sets out a classification of European welfare systems based on the categories of decommodification, destratification and defamiliarisation proposed by Esping-Andersen (1990). Section 3 clarifies the welfare sectors considered in the analysis, while the whole of Section 4 is dedicated to setting out the outcome indicators adopted for each welfare area. Section 5 sets out the method used for calculating the performance index, before going on to introduce data concerning net social expenditure (Section 6) which are subsequently analysed in relation to the performance index (Section 7) and other characteristics of the welfare systems considered, comparing, by means of a cluster analysis, the results obtained with the traditional classification of welfare systems (Section 8). Section 9 summarises the main results of the analysis.

2. Welfare models in Europe

In recent years, European countries have been characterised by a certain degree of convergence in their national social policies. This has occurred not just because of the demands of the economic crisis and an ageing population but also because of European guidelines in this context (Bouget, 2003).
Nevertheless, despite the fact that a number of aspects which are peculiar to

specific national contexts have been the subject of reform[1] and have therefore been aligned to a certain extent between the various countries, the general consensus is that four welfare models coexist in Europe, based on certain quantitative characteristics (i.e., the amount of resources dedicated to welfare) and qualitative characteristics (i.e., the kinds of measures implemented): the social-democratic model in the Nordic countries (Sweden, Denmark, Finland, Norway and the Netherlands), the corporative (or continental) model adopted by the continental European countries (Germany, France, Austria, Belgium, the Netherlands and Luxembourg), the Anglo-Saxon model (Ireland and the UK) and the Mediterranean model (Italy, Greece, Spain and Portugal).

Inclusive, generous forms of coverage distinguish the social-democratic model. In this area, in fact, the established welfare system is *folkhemment*, the "shared house" of all citizens, who find in it robust protections throughout the whole cycle of life (Ferrera et al., 2012). The Nordic countries exhibit high levels of expenditure allocated to social protection, totalling around one third of GDP, and have recorded a gradual increase over time. In terms of the qualitative aspects identified by Esping-Andersen (1990), the social-democratic system is distinguished by a predominance of universalist schemes characterised by a high degree of decommodification, as benefits are provided irrespective of the individual's occupational status and therefore his/her position in contractual market relations, a high degree of destratification, as equal treatment for all citizens means that social policies aim to reduce inequalities caused by occupational status or social class, and a high degree of defamiliarisation, that is, independence from family support (Esping-Andersen, 1999).

Partially different distinctive features characterise the continental model, which was introduced in Germany at the end of the nineteenth century by Bismarck, which from the outset adopted a strongly insurance-based approach centred around the figure of the male breadwinner and led to the development of social protection against the risks of old age (with benefits being in proportion to

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[1] Take, for example, pension reforms and national policies to extend provision of early childhood services which have been undertaken to reconcile work and family commitments recommended at the European level (Barcelona European Council, 2002).

pension contributions or remunerations) and mainly linked to citizens' occupational status. Citizens who receive these benefits are thus identified on the basis of their occupational status and measures are specifically related to their different occupational statuses. This type of model is also characterised by a generally high level of social expenditure, between 25% and 30% of GDP, and exhibits and intermediate degree of decommodification, as the fact that benefits depend on individuals' socio-economic status is only mitigated in certain cases (indeed, social policy measures depend largely on the beneficiary's occupational status). As a result, the degree of destratification is intermediate (as the main objective of social policies is not to reduce inequality), and the degree of defamiliarisation is low as the role of family support remains crucial in providing assistance (Esping-Andersen, 1999).

The Anglo-Saxon or liberal welfare model proposed by Beveridge in 1942 characterises Ireland and the UK. The main aim is to prevent phenomena of extreme poverty. Access to benefits is selective and based on means testing. State social benefits target a narrow segment of the population (individuals at high risk of social exclusion). At the same time, a relatively high number of individuals who do not qualify for State benefits turn to the market to purchase private insurance (for example health insurance and private pensions). Thus, the Anglo-Saxon model exhibits a low degree of decommodification (as apart from a narrow segment of individuals at high risk of poverty, market dependence is high with regard to incomes). Destratification is low as the system consists in a de facto dual form of welfare: private for the rich and public for the poor. The degree of defamiliarisation is intermediate as the burden of family support is non-negligible for vulnerable social groups.

The Mediterranean model is characterised by lower average levels of social expenditure (around a quarter of GDP) and a certain degree of fragmentariness among the mainly selective social expenditure programmes. A central role is assumed by the family and by parental assistance and there is a certain degree of differentiation between protection for employees in the public sector or of

large companies compared with other occupational categories. Following the classification proposed by Esping-Andersen (1999), the Mediterranean welfare system – a variant of the corporative model – is characterised by an intermediate level of decommodification and destratification, while the level of defamiliarisation is low.

Finally, Europe's recent eastward expansion hints at the possibility of identifying a fifth social model with lower levels of expenditure compared with the models mentioned above and with social policies which are still relatively heterogeneous in relation to each other as they are highly dependent of the peculiar characteristics of the socio-economic structure of the various countries.

3. Performance of the social sector: data and outcome indicators

The performance of the social sector is a concept marked by a certain complexity as it relates to both the efficiency and effectiveness of social policies, which are themselves dependent on a large number of factors and public policies which impact upon the various areas includes in welfare. In this paper, the performance of the social sector primarily refers to the degree to which the outcomes that policy-makers set out are achieved for the various sectors in which the measures are implemented. The multi-dimensional nature of the latter requires the construction of a synthetic indicator that takes into account the various categories of social expenditure.

To this end, we use the OECD Social Expenditure and Eurostat database, considering the following eight sub-sectors of social expenditure that it includes: family, health, labour market, the elderly, the unemployed, the disabled, income support and social assistance.
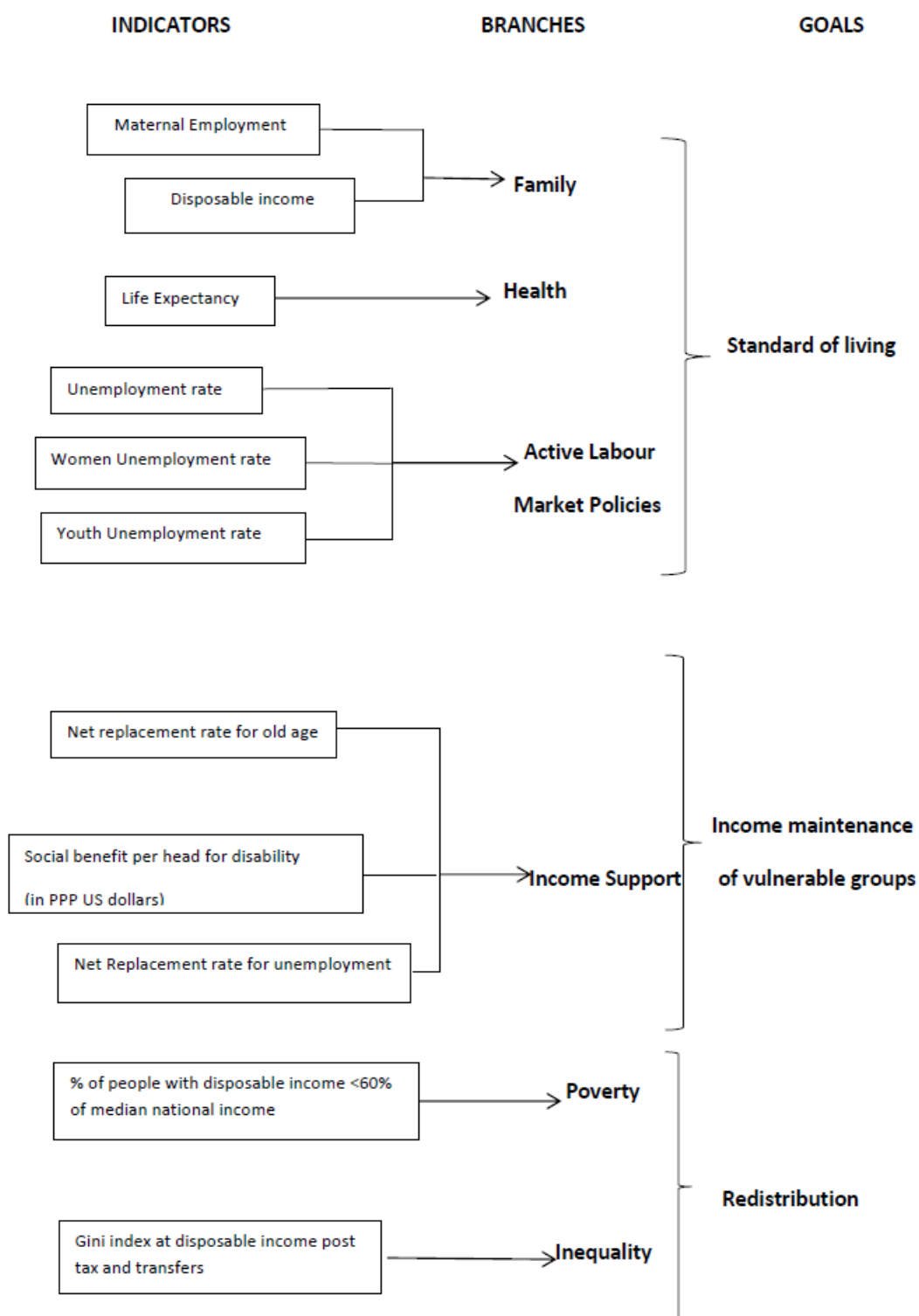
For the sake of clarity, it is possible to group the previous 8 sub-sectors into three main sectors which correspond to the three main objectives of welfare

policies: the maintenance of a certain standard of living (family policies, health policies, active employment policies), income support for vulnerable groups (the elderly, the unemployed and the disabled), and redistribution of resources to reduce inequality (reduction of poverty and concentration of income).

The next step in our analysis was to identify outcome indicators for each of the eight sectors while taking account of the objectives towards which the welfare policies in each sector are oriented, distinguishing between monetary and in-kind benefits (Fig. 1).[2]

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[2] Readers are referred to Table A1 in the Appendix for details regarding individual expenditure items.

Fig. 1 Goals and Indicators of Welfare Policies

INDICATORS	BRANCHES	GOALS

Maternal Employment

Disposable income

→ **Family**

Life Expectancy → **Health**

Unemployment rate

Women Unemployment rate → **Active Labour Market Policies**

Youth Unemployment rate

Standard of living

Net replacement rate for old age

Social benefit per head for disability (in PPP US dollars)

Net Replacement rate for unemployment

→ **Income Support**

Income maintenance of vulnerable groups

% of people with disposable income <60% of median national income → **Poverty**

Gini index at disposable income post tax and transfers → **Inequality**

Redistribution

The indicators which directly or indirectly represent monetary variables (such as household income, coverage of unemployment benefits or pensions in percentage terms or the income based on which the Gini index is calculated) are expressed in net terms,[3] i.e. net of fiscal measures (which take three forms: direct taxation of income resulting from social transfers, indirect taxation of consumption by recipients of transfers, and tax benefits for social welfare purposes) which national governments impose upon it. Following Adema et al. (1996, 1999, 2014) and in contrast to the prevailing literature, public expenditure allocated to social purposes is considered in net (and not gross) terms, thus representing the net – albeit aggregate – benefit that national social policies provide for beneficiaries. In this sense, it represents a more appropriate indicator of the intensity of public intervention in the social sector.

We use data referring to 2011 (at the time of writing the last year for which a complete reference database can be constructed) for 19 European countries.

Family policies are mainly oriented towards reconciling work and family life, and regard the provision of educational and care services for early childhood, parental leave and forms of home care for children or the elderly. The ultimate objective may therefore be identified as encouraging greater participation in the employment market on the part of women, who are often penalised by the burden of family responsibilities, in light of European recommendations in this regard.[4] A further line of intervention, on the other hand, regards the granting of tax benefits (deductions, detractions or tax credits) or monetary transfers for families with children in order to support their income level and, ultimately, in order not to discourage births.

As indicators for family welfare measures we have therefore used the maternal employment rate and, by means of a simulation analysis, calculated the net

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[3] Where necessary, for the purposes of international comparison, monetary variables are expressed in purchasing power parity (PPP) terms (US dollars).

[4] The recent *Country Specific Recommendations* (2013) contain recommendations for the 13 Member States concerning the promotion of female employment in the labour market through the adoption of policies to reconcile work and family life and the removal of fiscal disincentives to female labour (Rossilli, 2014).

disposable income of a "typical" family – which we adopt as a benchmark – consisting of two children and two working parents with, respectively, a gross income from employment equal to 100% and 67% of the average income from employment in their country of residence.[5]

According to the prevailing literature (Tanzi et al. 2000, 2003, 2006), life expectancy at birth would seem to be a good indicator of the performance of health policies.

The third group of social policies geared towards ensuring the maintenance of a certain standard of living can be identified in what have been called "active labour market policies", that is, all those initiatives (such as training, work-related education, apprenticeships, careers guidance tools, etc.) designed to promote employment and work placement. Consequently, active labour market policies are geared towards reducing the unemployment rate. In order to take into account various categories of worker, in addition to the overall unemployment rate we have considered unemployment rates for another two aggregates which are the subject of special attention in national welfare policies: the female unemployment rate, to which reference is frequently made in the European recommendations,[6] and the youth unemployment rate,[7] which has been especially impacted by the economic crisis that has affected the various countries since 2007.

Income support policies target groups of individuals who within the framework of the market economy exhibit a certain degree of vulnerability: the elderly, the unemployed and the disabled. For each of these categories of individuals we have identified as the benchmark indicator the average amount of available

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[5] Net disposable income has been calculated by subtracting from gross taxable income (adjusted for any deductions granted) income tax (considering any deductions or tax credits) and social contributions and adding any monetary benefits granted to the type of family under consideration by the relevant country. For the simulation analysis the OECD's tax-benefit calculator model (available at the following link: http://www.oecd.org/els/soc/benefitsandwagestax-benefitcalculator.htm) has been used.

[6] See note 5.

[7] Based on the number of people aged 15-24 out of work in relation to the youth workforce (people in or seeking employment in the 15-24 age group).

resources (therefore net of fiscal measures) which the various national welfare systems guarantee them. For the elderly we have used the net replacement rate relating to compulsory pension schemes that represents the percentage of individual income, net of contributions and taxes, which the pension system guarantees the single individual after he/she exits the job market. Formally, this is represented by the ratio of the net pension to income from employment net of tax. Three levels of income from employment were considered: 50%, 100% and 150% of national average income from employment.

Following the same logic, a simulation analysis was used[8] to calculate the net replacement rate of unemployment benefits during the first year of unemployment that represents the proportion of net income from employment "replaced" by net benefits received in the event of unemployment. The latter, in turn, depend on both income from employment and the recipient's family situation. Therefore, two income categories were considered (67% and 100% of national average income from employment) and, within each of them, six types of family:[9] three "typical" families (single parent, single-earner households and families with both partners in employment) without children and three families of the same types with two underage children.

For the disabled we calculated the monetary benefit that, on average, national governments allocate to disabled individuals in the form of disability pensions or monetary transfers in order to pay medical expenses relating to their disability or to pay for care and assistance.

Finally, in the area of redistribution policies, reference was made to the Gini index, calculated based on after-tax disposable income and transfers, and the poverty index that in our case indicated the percentage of households with disposable incomes[10] at least 60% lower than the median national income.

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[8] See note 4.

[9] The figures are reported in the Appendix.

[10] The concept to which the OECD "Income distribution and poverty" database refers is "equivalised disposable household income", that is, net household income (net of taxes and

4. The performance index

The next step in the analysis consisted in calculating a synthetic performance index recorded by the countries in each sector of social expenditure by normalising the values of each outcome within the group of the 19 countries concerned.

Our performance index[11] for the ith country and j^{th} sector of social expenditure at time t is thus given by:

$$0 \leq P_{i,j,t} = \frac{x_i - x_{\min}}{x_{\max} - x_{\min}} \leq 1$$

i=1, 2...19   j= 1, 2,.....8

where x_i is the value of the benchmark indicator for expenditure sector j assumed by country i, while x_{min} and x_{max} represent, respectively, the minimum and maximum values for the same indicator within the group of the 19 countries concerned.

The performance index in question is "relative", ranging between 0 and 1, and enables a comparison within the group of the countries under consideration. $P_{i,j}=0$ is indicative of the case in which the ith country exhibits the worst performance of the jth sector of social policies; conversely, $P_{i,j}=1$ represents the best outcome in terms of the indicator associated with the jth sector of expenditure.

In order to ensure that the highest values of the indicator are representative of the best performances, it was necessary to transform a number of variables such as: unemployment rate (in the three types considered), the poverty index and the Gini index of income concentration. In this case, it is in fact clear that higher values of the index would indicate a high gap in the unemployment rate, the poverty index and income concentration index compared with the

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inclusive of transfers received) adjusted according to household composition according to equivalence scales.

[11] With reference to 2011.

respective minimum values, indicating worse – and not better – performance for the country concerned.

We therefore considered the complement to one of the preceding three outcome variables interpretable as employment rate, a "welfare" index representative of the percentage of households with disposable income of over 60% of the median disposable income and an index of equidistribution of disposable income.

For the sectors of social expenditure associated with several benchmark indicators (for example family, the elderly, unemployment, labour market and redistribution), their average was considered by following the methodology used in calculating the Human Development Indices.[12] Finally, the aggregate indicator for the whole area of the social sector was obtained by adding together the individual partial indicators in accordance with the existing literature (Tanzi *et al.* 2000, 2006). For country *i* at time *t* we thus have:

$$P_{i,t} = \sum_{j=1}^{8} P_{i,j,t}$$

The following table shows the results of the indicator for the individual sectors of social policies considered and, in the final column, the aggregate value.

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[12] See the methodological notes available at the following link.
http://hdr.undp.org/en/content/calculating-indices

Table 1 Social policy performance indicators (2011)

Countries	Family	Health	Old Age	Disability	Unemployment	Poverty	Labour Market	Redistribution	Final Index
Austria	0,62126	0,76923	0,69613	0,27054	0,57708	0,58520	0,96474	0,66075	5,14493
Belgium	0,54025	0,70769	0,25276	0,22685	0,62500	0,05815	0,75571	0,84799	4,01441
Czech Republic	0,04080	0,29231	0,40562	0,01794	0,67500	0,89162	0,76149	0,93159	4,01637
Denmark	0,74328	0,58462	0,86510	0,57980	0,35000	0,75367	0,80626	0,96719	5,64992
Finland	0,64226	0,69231	0,40055	0,44982	0,57500	0,63015	0,74595	0,83303	4,96906
France	0,53762	0,93846	0,31446	0,17976	0,60000	0,64553	0,65004	0,37331	4,23919
Germany	0,54099	0,72308	0,23849	0,26485	0,00000	0,60777	0,93137	0,54114	3,84768
Greece	0,22281	0,72308	0,99908	0,00000	0,50000	0,00000	0,07527	0,09506	2,61530
Iceland	0,70495	0,96923	1,00000	0,47771	0,37500	1,00000	0,82588	0,98924	6,34201
Ireland	0,32647	0,72308	0,00000	0,05873	1,00000	0,48720	0,45781	0,44988	3,50317
Italy	0,17596	0,95385	0,46455	0,08643	0,45000	0,19092	0,56832	0,24245	3,13247
Luxembourg	0,71300	0,76923	0,79834	0,79098	0,67500	0,55655	0,82431	0,72141	5,84884
Netherlands	0,73258	0,80000	0,85681	0,30320	0,00000	0,75450	0,97680	0,64757	5,07146
Norway	0,75070	0,81538	0,31215	1,00000	0,17500	0,74372	1,00000	1,00000	5,79696
Portugal	0,39984	0,69231	0,45350	0,06413	0,55000	0,33885	0,44803	0,03200	2,97866
Slovak Republic	0,02455	0,00000	0,48297	0,01405	0,87500	0,60981	0,38541	0,87468	3,26647
Spain	0,26545	1,00000	0,63536	0,08215	0,37500	0,03751	0,00000	0,00490	2,40037
Sweden	0,69777	0,89231	0,36188	0,58968	0,80000	0,40445	0,68475	0,74863	5,17946
United kingdom	0,49666	0,75385	0,05341	0,14525	0,22500	0,44252	0,72489	0,00000	2,84157

The final values are characterised by a high degree of heterogeneity within the group of countries considered, ranging from 2.4 (Spain) to 6.3 (Iceland). Higher indicators (values > 5) are associated with the Nordic countries (the Netherlands, Sweden, Denmark, Norway, Luxembourg and Iceland) and Austria; Ireland, Germany, Belgium, The Czech Republic, France and Finland fall within an intermediate range (between 3.5 and 5) while the indicator for the Mediterranean countries (Spain, Italy, Greece and Portugal) together with Slovakia and the UK is lower (with values lower than 3.5).

The disaggregated analysis of the index (Fig. 2) shows diversity in the composition of the index. Performance levels of the "household", "health", "employment market" and "redistribution" sectors are higher in the Nordic systems (Finland, Sweden, Iceland, Luxembourg, the Netherlands, Denmark and Norway) and in some of the countries with a continental welfare model

(Germany and Austria) which achieve an indicator of over 0.5. In the Mediterranean countries, in contrast, the better-performing components are represented by "health" and "the elderly", while markedly poor performances are highlighted by context indicators relating to the fight against poverty and redistribution policies.

Fig. 2 Composition of the performance index by sector
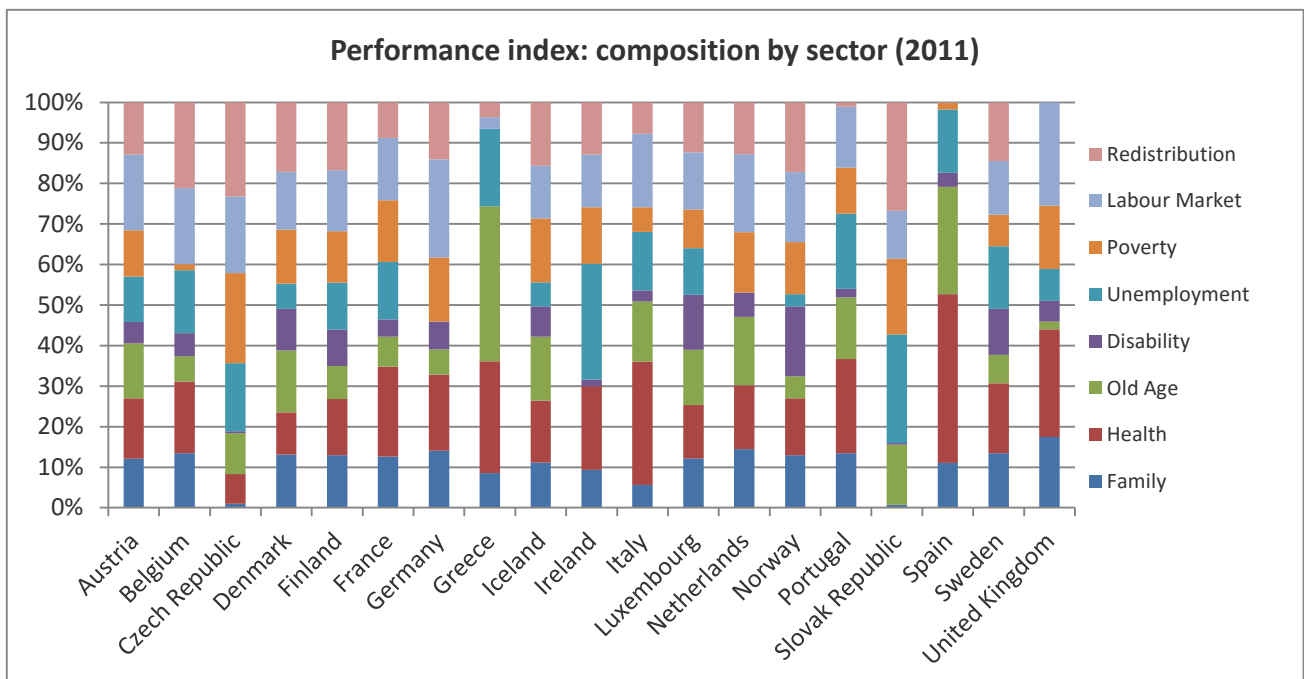
## 5. Variability in the performance of the social sector

As can be seen from Table 1, the performance index of the social sector is characterised by a certain degree of variability in the context of the European countries considered, as is its composition (Fig. 2).

What might account for such variability in performance? Are higher levels of performance necessarily associated with higher levels of expenditure? Or does an increase in the level of performance instead require a rationalisation of

spending policies with an internal reallocation of resources (for example between the various types of measure)?

At first sight, the level of expenditure would appear to be the explanatory variable. High values of the performance index (≥ 5) are seen in the Nordic countries, which typically have generous social policies, while markedly lower values (≤ 3) are associated with the Mediterranean countries, which are traditionally characterised by a lower level social expenditure. The correlations between total gross social expenditure[13] and the performance index in fact is positive, and linear interpolation accounts for around 18% of the phenomenon (Fig. 3).

Fig. 3 Gross Social Expenditure/GDP and Performance index (2011)
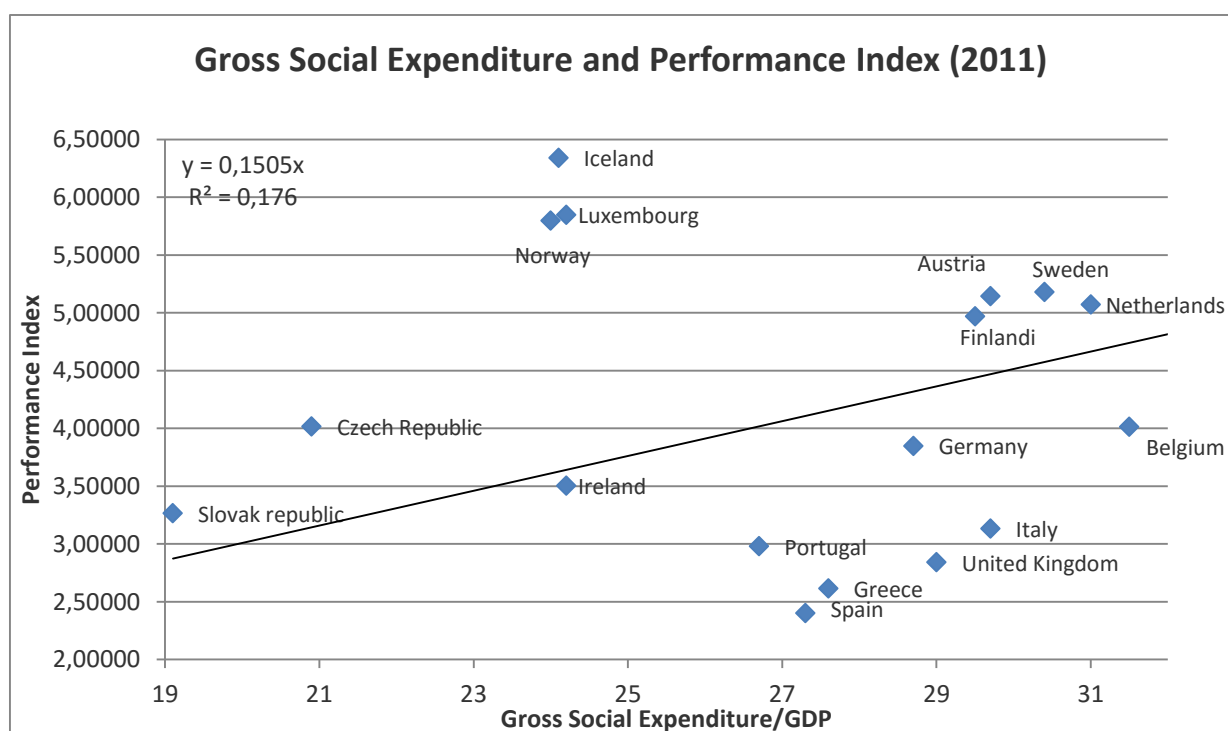
Source: analysis of OECD data

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[13] The figure therefore also includes private measures implemented in the social sector, which however have a minimal impact on national social policies (see note 14).

In recent years, however, several socio-economic factors have had an impact on national social policies, modifying the level of expenditure in a non-uniform way. Between 2000 and 2011 public social expenditure increased by 7% in relation to GDP in the Nordic countries (Sweden, Finland and Norway) and by 29% in the Mediterranean countries (Greece, Italy, Portugal and Spain), thus reducing discrepancies, which nonetheless persisted.

This phenomenon is even more evident if we consider net public social expenditure, that is, social spending not only net of measures undertaken by the private sector[14] but also of fiscal measures (in three forms: direct taxation of income resulting from social transfers, indirect taxation on consumption by recipients of transfers, and tax benefits for social welfare purposes) which the State imposes on it.

Following Adema et al. (1996, 1999, 2014) and in contrast to the prevailing literature, we therefore consider net (and not gross) public expenditure which represents the net – albeit aggregate – benefit that national social policies provide for beneficiaries. In this sense, it represents a more appropriate indicator of the intensity of public intervention in the social sector.

In the Nordic countries (Finland, Denmark, Luxembourg, Norway and Sweden), fiscal measures (taxation net of tax benefits granted) reduce gross social expenditure by around 20%. More limited measures characterise the other countries.

The result is reduced variability in net levels of expenditure (from 18.2 for total gross expenditure to 9.3 for net public expenditure) and a reranking of the countries,[15] mainly placing all of the countries in the Nordic system (with the exception of Norway) and a number in the continental system (Austria and

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[14] Private expenditure in the social sector is limited, albeit higher in the Nordic countries. Indeed, in 2011 it accounted for around 5% of total social expenditure in Iceland, the UK and Denmark. The highest value is observed in the Netherlands where private expenditure in 2011 was 6.8% of total social expenditure. In the other countries it ranged from a minimum of 0.2% to a maximum of around 3% of total social expenditure.

[15] The Appendix provides data on public and net social expenditure and the associated country rankings.

Luxembourg) in lower positions. By comparing the performance indicator with net social expenditure in relation to GDP (Fig. 4), a high level of variability of the index emerges corresponding to given levels of expenditure, as does the absence of a clear general trend, while clearer correlations can be observed within the subgroups of countries.

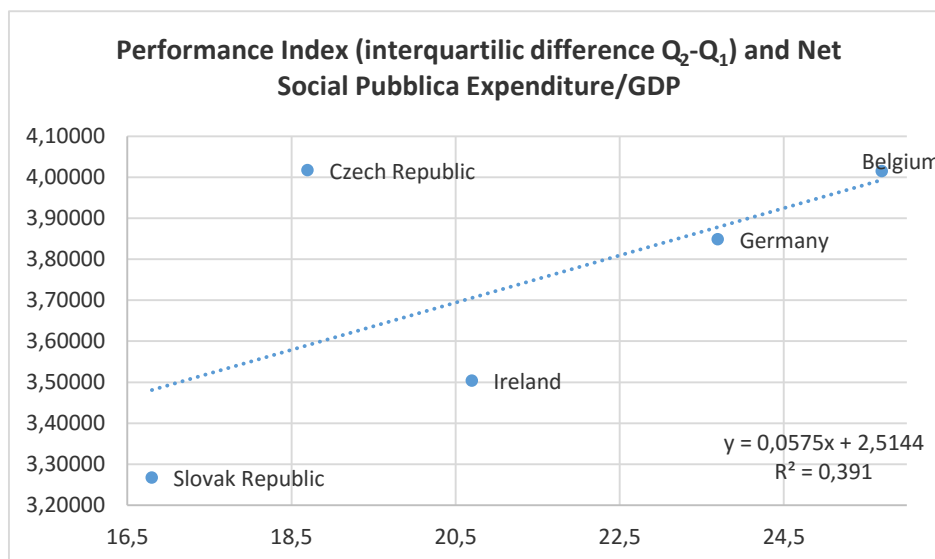**Figure 4. The performance index and net public social expenditure/GDP (2011)**
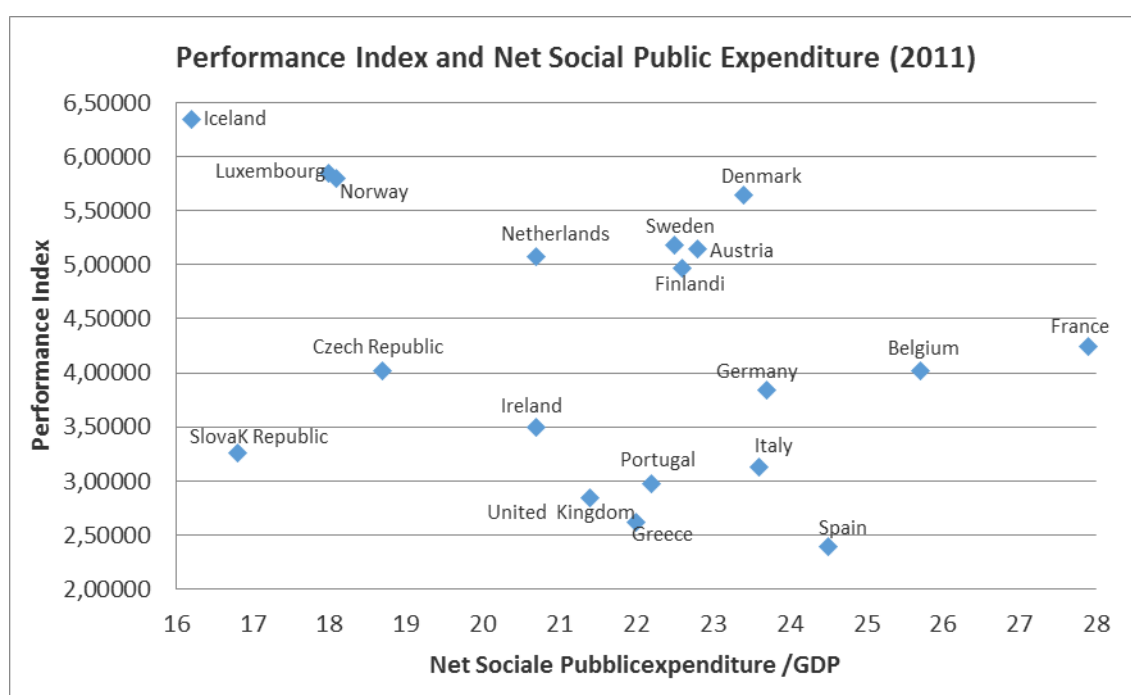
Consideration of net expenditure does not enable the traditional four-way distinction of national welfare systems to be made on the basis of social expenditure. Fig. 4 shows that most of the countries considered – belonging to different welfare models – rank between the first and the third quartile of net public social expenditure (with values, respectively, of 23.5 and 19.7) and with an extremely high degree of heterogeneity in terms of their respective performance index.

Conversely, we may investigate the relationship that exists between the two variables considered (performance index and net public social expenditure/GDP) by classifying the countries into subgroups distinguished by difference levels of performance. What emerges is that for countries lying at the extremes of the distribution according to performance index,[16] there is not a strong positive correlation with expenditure. Therefore, the performance level of the social system appears to be unrelated to the national level of expenditure. In this regard, possible differences in performance levels and the resulting possible policy measures may regard qualitative differences (such as the composition of social expenditure in terms of purpose, the mechanism for financing said expenditure of the main type of measures – monetary or in-kind – that may have an impact on the outcomes of social policies) as opposed to quantitative differences in social policies.

A difference situation emerges when considering those countries which place between the first and second quartile of the index (with corresponding values of 3.2 and 4.01) for which a positive correlation exists (with a correlation coefficient of 0.63) between expenditure level and the performance of the social system (Fig. 5).
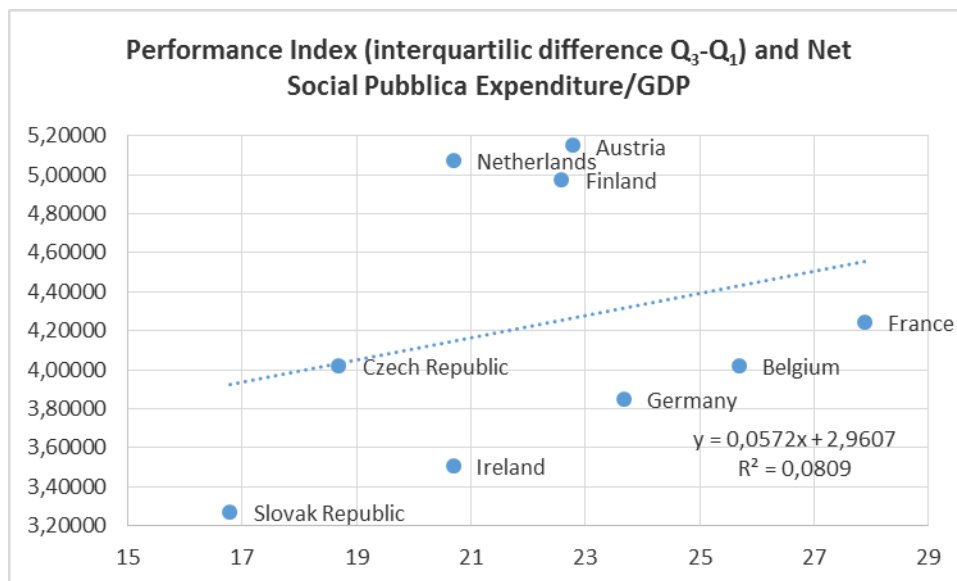
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[16] The reference is to countries belonging to the first quartile and to the interquartile difference Q4-Q3 of the performance index distribution (the benchmark value for the first quartile is 3.2, while the third quartile is given by 5.16). The countries in question are the Nordic countries and the Mediterranean countries.

Fig. 5 Performance and Net Public Social Expenditure: subgroup 1 (2011)

Performance Index (interquartilic difference Q_2-Q_1) and Net Social Pubblica Expenditure/GDP

$$y = 0,0575x + 2,5144$$
$$R^2 = 0,391$$

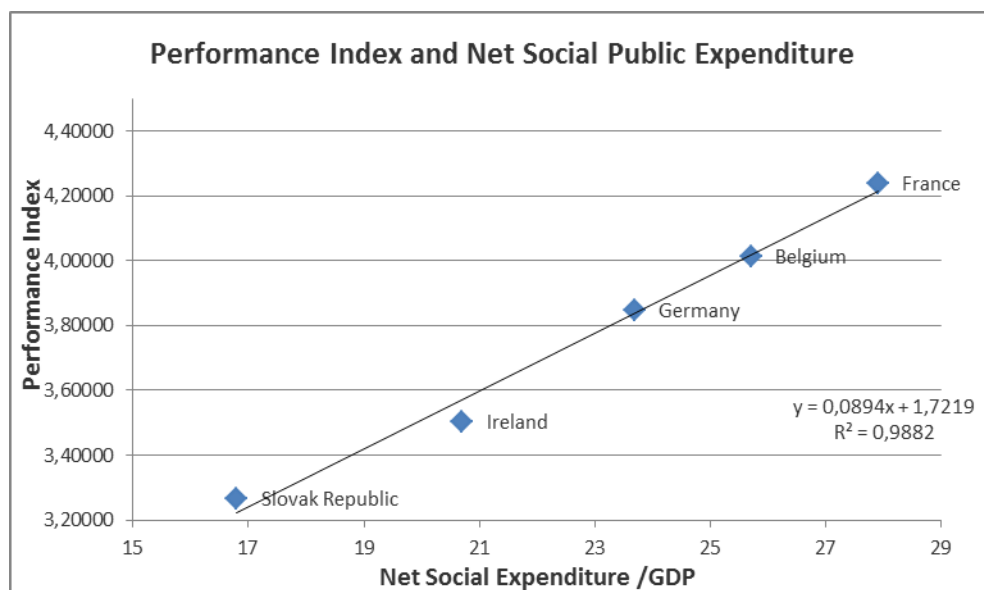**Source: analysis of OECD and Eurostat data**

The correlation remains positive but is less marked (with a correlation coefficient of 0.28) if we gradually expand the set of countries, extending the analysis to performance index values falling within the third and first quartile of the distribution (Fig. 6).

Fig. 6 Performance and Net Public Social Expenditure: subgroup 2 (2011)

Performance Index (interquartilic difference Q_3-Q_1) and Net Social Pubblica Expenditure/GDP

$y = 0,0572x + 2,9607$
$R^2 = 0,0809$

Source: analysis of OECD and Eurostat data

In contrast, the correlation between expenditure and performance for some continental countries (France, Belgium, and Germany) is markedly clearer, with the addition of Ireland and Slovakia (Fig. 7).

Fig. 7 Performance and Net Public Social Expenditure: subgroup 3 (2011)

Source: analysis of OECD and Eurostat data

The analysis illustrated above does not evidence a clear relationship between performance of the social sector and (net) resources invested in social policies. This is more evident in countries with a high or low performance index, while countries that rank in intermediate positions in terms of the outcomes of social policies (primarily France, Belgium, and Germany, to which Ireland is added) show a positive correlation between net expenditure and performance.

In general, the level of net expenditure does not seem to be the main explanatory variable for the different results that characterise the social sector of the various countries. Despite essentially similar levels of net expenditure, a high degree of variability in terms of performance is observed, such as in the cases of Italy, Germany and Denmark, for example. This variability in performance thus does not appear to be attributable to private expenditure in the social sector (which is not included in the net social expenditure figure) which is in any case limited in comparison with public policies in all of the countries.

In Denmark, it accounts for around 5% of total social expenditure, while in Italy and Germany private involvement in the social sector is much lower (respectively 0.8% and 2% of total social expenditure). For this group of countries, it may thus be deduced that Denmark's better performance Denmark can be accounted for, at least in part, by the greater involvement of the private sector. Nevertheless, the role of private social expenditure does not seem to represent the key element in evaluating variability in the countries' performance. Private-sector participation in welfare in the UK is the same as in Denmark (around 5%), yet its outcome indicators are overall markedly lower than those of Ireland and Slovakia, where net expenditure levels are lower and primarily public in nature.

It is therefore necessary to perform a direct qualitative analysis aimed at identifying the qualitative factors (type of measure, intervention sectors, etc.) which have the greatest impact on the results in order to identify the variables that can best be the subject of policies of rationalisation of social expenditure.

6. How many welfare systems in Europe? A cluster analysis

In addition to the quantity of resources allocated to public expenditure, another variable identified in the literature to characterise welfare systems is the composition of expenditure. This refers to the relative importance attributed to the three main aims of welfare systems: increasing remuneration for participation in the labour market, combating social exclusion and reducing inequality. The first objective is typically pursued by means of measures designed to protect workers from the risks associated with the labour market and their own life cycle, such as unemployment benefits and pensions, in-kind transfers linked to previous employment, as well as active labour market policies. The second objective is pursued by means of social security transfers designed to provide for those in need. The third objective is pursued through universal transfers.

In practice, it is difficult to assign each item of expenditure to one single objective, as instruments may target more than one of them at the same time. Based on the main objective, we have divided social expenditure into the three types for the European countries under consideration (see Table A4 in the Appendix).

The data indicate that the main objective is connected with labour market participation in Austria, Belgium, the Czech Republic, Finland, France, Germany, Italy, Portugal and Spain. Redistribution prevails in Denmark, Iceland, the Netherlands, Norway and Sweden (countries traditionally characterised by a low level of income concentration), while in Iceland, Ireland and the UK social assistance is relatively more important, exceeding 10% of overall expenditure.

Thus, countries exhibiting a higher performance index are those in which the third objective is predominant.

Another perspective from which the composition of expenditure can be assessed is the difference between monetary transfers and direct provision of social services, an element that differentiates the welfare systems identified in the literature. On average, the ratio of cash transfers[17] to benefits in kind in OECD countries is 70%. This ratio is below 60% in Sweden (0.35), the UK (0.45), Iceland (0.51), Norway (0.54), Germany (0.56) and Denmark (0.58).

Does a correlation exist between these indicators and the performance index? In order to answer this question, we conducted a cluster analysis for the year 2011 (Greece and Luxembourg were not included because of lack of data). As indicators of the composition of social public expenditure, we used the shares of expenditure connected with the labour market, with social assistance and with redistribution in total gross public social expenditure and the ratio of monetary benefits to benefits in kind. Variables were scaled by their standard

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[17] Considered net of pensions, since these reflect contributions paid and the demographic structure of the population.

deviation; we used the Euclidean measurement of distance and the average link aggregation method.

The results show that countries are divided into five groups: the first one comprises the UK on its own; the second Denmark, Sweden, Norway, the Netherlands, Iceland and Ireland; the third the Czech Republic and Slovakia; the fourth Austria, Germany, Belgium, Finland and France; and the fifth Italy, Spain and Portugal. The groups do not change if the share of public social expenditure in GDP is included.

With the exception of Austria and Ireland (the latter being in any case an outlier on the "edge" of the group of central European countries), the results confirm the association between the type of welfare system, according to the traditional classification, and the level of performance illustrated in the previous section. The Nordic countries are characterised by a high level of the index, the central European countries by an intermediate level, and the southern European countries and the UK by a low level.

The results also indicate the existence of a positive link between performance, level and composition of social expenditure: countries characterised by high shares of public expenditure mainly geared towards redistribution perform better in the social sector.

This seems to confirm that European countries belong to the traditional types of welfare systems, apart from Ireland shifting away from the Anglo-Saxon group towards the continental countries.

This conclusion, however, is dependent on the choice of indicators used for the cluster analysis, and the same is true in general for the results obtained in the literature: the diversity of the results often stems from different choices with respect to the characteristics of the welfare systems deemed significant.

For example, Bertola et al. (2001) confirm the existence of the Anglo-Saxon group and of a group consisting of Spain and Portugal, while the Nordic

countries, especially Sweden and Finland, and the continental countries are very close to one another. Considering specifically the level of social expenditure and its composition, Bertola et al. (2001) identify the following groups for the year 1990: Denmark and the Netherlands; Spain and Portugal; Ireland and the UK; Greece and Italy; Germany, Austria, France, Finland and Belgium. In 1996, the groups had become Denmark, Spain and Portugal; Ireland and the UK; Germany, Austria, Greece and Italy; France, Finland, the Netherlands, Sweden and Belgium. Their results also show a decrease in the distance between the Nordic countries and the continental countries.

The distinction between the continental and the southern group is actually an issue debated in the literature. Minas et al. (2014) agree on the existence of the fourth southern model; applying cluster analysis to the aspects of familiarisation, the predominance of State or market, religion and favouritism, they distinguish a group of countries formed by southern European countries and – moving beyond the geographical connotation – by Ireland. Joumard et al. (2012), instead, using indicators relating to the size, mix and progressivity of taxes and transfers, do not find a distinct group for these countries.

In fact, a convergence of European welfare systems could be a result of the process of economic integration. Indeed, this may have influenced welfare systems via various channels. First, by increasing growth in the poorer countries, it may entail both a greater need and a greater capacity to fund systems of social protection. Secondly, the fiscal criteria of the Maastricht Treaty may have exerted a pressure to rein in social expenditure for all countries. Finally, the greater mobility of labour may have enabled a greater degree of insurance against market dynamics, but may also have led to tax competition between countries (Sandmo, 2001; Sinn, 2002).

With regard to the first two points, Caminada et al. (2010) note that economic integration has favoured growth in relatively poorer countries and that between 1995 and 2003 gross public social expenditure rose, with a convergence among countries. This seems to contradict the existence of negative effects of the

Maastricht Treaty and the Stability and Growth Pact on the social protection effort, as noted in Bertola et al. (2001). Nevertheless, the latter paper pointed to changes in the implementation of welfare programmes: 1) the tightening of eligibility criteria, in particular by stepping up means testing; 2) better coordination of services and greater decentralisation; 3) a trend towards greater recourse to private social expenditure. In addition, if we consider net public social expenditure, we find – as Caminada et al. (2010) note – that it has decreased, with a diverging trend among countries.

With reference to the third point, the literature does not find evidence of tax competition (Caminada et al., 2010). This might be due to the convergence stimulus provided by the objectives of the EES (European Employment Strategy) and the Lisbon Strategy. For example, for active labour market policies, Van Vliet (2010) notes that expenditure has increased, although differences persist between countries in the configuration of the instruments adopted.

Thus, our analysis accounts for the variability of performance by using indicators (such as the gross public social expenditure/GDP ratio, the composition by target, and the share of benefits in kind in total expenditure) that are characteristics for which welfare systems have not shifted away from their traditional configuration.

In what follows, we try to represent the structure of welfare systems more completely, that is, using a broader set of indicators, including variables both on the expenditure side and on the financing side. In particular, we consider the composition of gross public social expenditure (share of each sub-sector; ratio of monetary benefits to benefits in kind; shares of expenditure connected with the labour market, with assistance and with redistribution in total gross public social expenditure); size of the welfare system (measured, alternatively, as gross public social expenditure, net public social expenditure, total gross social

expenditure[18] and total net social expenditure, as a share of GDP); financing methods (revenue levels of taxes on social transfers as a share of GDP and share of direct and indirect taxes within them; ratio of total tax revenues to GDP and shares of personal taxes including social contributions, taxes on goods and services and property taxes); Gini index after tax and transfers (the source of the data is the OECD Statistical Database). With reference to the same 17 European countries examined previously, we conducted a cluster analysis for the year 2011. Variables were scaled by their standard deviation; the Euclidean measurement of distance was used, while the aggregation method used was the average link method. The main results can be summarised as follows:

a) Composition

The first cluster analysis regards the composition of public expenditure. By initially considering only the shares of total public social expenditure represented by the sub-sectors, three groups are identified: a Nordic group, consisting of Denmark, Finland, Norway and Sweden, towards which also the Netherlands gravitates; a second, "continental" group, including also the southern countries, the Czech Republic, Slovakia and Ireland, the latter being relatively close to Spain and Belgium, just as Austria, Portugal and Italy are very close to each other: note that this configuration excludes – at least with regard to composition by sub-sectors - the existence of a cluster of southern countries. The third group is formed by the UK and Iceland.

Adding the ratio of monetary benefits to benefits in kind does not change the groups.

With the addition of the division of expenditure by purpose (labour market, social assistance and universal measures), the groups change: the Nordic group

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[18] Total social expenditure includes private social expenditure: private programmes may in fact substitute public programmes in the pursuit of the same objectives (Adema *et al*., 1996; 2011), although with a lower redistributive impact (Begg and Bergman, 2002; Antonelli and De Bonis, 2015).

now also includes Ireland. It may be noted that, when considering only the three-way division, the Netherlands is much more similar to the Nordic countries. In addition, when considering only the three-way division, Finland would join the continental group, and Iceland the Nordic group, forming a subgroup with Norway, the Netherlands and Ireland, while Denmark and Sweden would constitute the other subgroup.

b) Composition and levels

Adding gross public social expenditure (as a share of GDP) confirms the existence of a Nordic group with the Netherlands, a central group, which is joined by Ireland on the one side and the Czech Republic and Slovakia on the other, and a third group, comprising the UK and Iceland, while, when considering net public social expenditure, Ireland returns to the Nordic group. The same result is obtained by using total gross or net social expenditure in place of net public social expenditure.

c) Composition, levels, Gini index (after taxes and transfers)

Adding the Gini index does not change the result if net public social expenditure or total public social expenditure is used. Yet, if gross public social expenditure is used, the addition of the index results in the decomposition of the central group into five subgroups: Ireland; Spain and Belgium; Italy and Portugal; the Czech Republic and Slovakia; and Germany, France and Austria.

To evaluate the role of the individual variables in determining the clusters, it may be noted that:

- Considering only the sub-sectors and gross public social expenditure, Ireland joins the Nordic group, while it is in the continental group if net public social expenditure is considered; the continental group sees Germany and France closer to Austria, Portugal and Italy than to Spain and Belgium and to the Czech Republic and Slovakia. If the ratio between monetary transfers and benefits in kind is added, Ireland joins

the group of continental countries, where Spain and Belgium are less central than the Czech Republic and Slovakia.

- Adding the Gini index results in Austria, France and Germany moving closer to each other within the central group (including Ireland), if gross public social expenditure is considered.

- Considering the sub-sectors, the three-way division according to purpose, the ratio of monetary benefits to benefits in kind and the performance index (therefore excluding social expenditure levels), three subgroups are obtained within the central group: Ireland, Spain, Belgium; Portugal and Italy; Austria, France, Germany, Slovakia and the Czech Republic. Without sub-sectors, Iceland joins the Nordic countries, while Finland lines up with the central countries.

d) Financing

Another aspect that characterises welfare systems are the financing instruments, both in terms of the dimensions of total revenue and its composition. Alesina et al. (2001) contrast the US and European welfare systems, particularly with regard to the greater effectiveness of the latter in terms of redistribution, connected with greater revenues from social contributions and VAT and more progressive personal income taxation, enabling greater financial coverage for income support policies and labour market measures.

Bertola et al. (2001), particularly with regard to European countries, identify in general taxation and social contributions the main sources of financing of social protection, the latter being more important in the continental and southern systems than in the Nordic and Anglo-Saxon countries (to which Iceland and Portugal can be added, based on 2011 data). With reference to 2011, the total revenues/GDP ratio was 24% in the USA, a lower level than in European countries, which nevertheless record significant differences, ranging

from 26.7% in Ireland (with 33.6% for the UK and 28.3% for Slovakia) to 46.6% in Denmark (with Austria, Belgium, Finland, France, Italy, Norway and Sweden above 40%). Based on these data, Antonelli and De Bonis (2015) find a positive correlation between levels of gross and net public social expenditure, respectively, and total revenues.

In addition to the level of revenues, European countries differ as for the type of taxation. With reference to 2011, the share attributable to direct taxes is larger in Iceland, Norway, the Netherlands, Italy, Sweden, and Denmark, closer to the average ratio in Germany, Austria and Finland and smaller in the remaining countries. An analysis of the data reveals a positive correlation between public expenditure, especially gross public expenditure on social protection, and the share of total revenues accounted for by direct taxes, confirming the importance of redistributive taxes already observed in the comparison between European countries and the USA (Antonelli and De Bonis, 2015).

Considering the financing of social expenditure, first separately and then together with other variables, different groups emerge from the ones that take shape when expenditure-side variables are used. For instance, the UK and Ireland belong to the same group only if the tax system is included in the analysis, while other authors find that an Anglo-Saxon group also exists if exclusively expenditure-related variables are considered (Bertola et al., 2001; Corrado et al., 2003). In addition, the Nordic countries and the central countries are very close to each other.

Considering only taxes on social transfers, in particular the ratio of total revenue to GDP and the share of direct taxes and social contributions, the groups are very different from the ones that form on the expenditure side. More specifically, two groups are obtained, one consisting of the UK, Ireland, Spain and Portugal, the Czech Republic and Slovakia, and the other of the Nordic core countries and the continental countries, in addition to the Netherlands, Finland and Iceland. Denmark occupies an intermediate position between the two groups.

Considering the total revenues to GDP ratio and the shares of personal income taxes, taxes on goods and services and taxes on property, two groups are obtained, one formed by the UK; Ireland and Iceland, the Czech Republic, Slovakia and Portugal; the other one by Sweden, Norway and Denmark; France, Italy and Belgium; Spain; the Netherlands, Finland, Germany and Austria. Spain thus belongs to the first group, if taxes on social transfers are considered, and to the second, if all taxes are considered.

Considering all variables relating to financing, two groups are obtained: the first with a subgroup consisting of the UK, Ireland, Portugal, Iceland and another one consisting of the Czech Republic and Slovakia; the second with the subgroup Denmark, Sweden and Norway and the subgroup Italy, France, Belgium, the Netherlands, Germany, Finland and Austria; Spain is closer to the first group if taxes on social transfers are considered, and to the second when considering total taxes.

e) Expenditure and financing

Considering together the variables relating to expenditure composition and levels, i.e. composition by sub-sectors, monetary and in-kind transfers, purpose of expenditure, levels (gross public social expenditure/net public social expenditure/total social expenditure, total net social expenditure), the after-tax-and-transfers Gini index, revenues from taxes on social transfers (ratio to GDP) and shares of direct and indirect taxation, total revenue to GDP ratio and shares of personal taxes including social contributions, taxes on goods and services and property taxes, three clusters are obtained. The first is formed by the UK and Iceland; the second by the subgroup of the Nordic countries and the Netherlands; the third by Ireland, the subgroup of Portugal, the Czech Republic and Slovakia and by the subgroup of Spain, France, Belgium, Germany, Italy and Austria. It may be observed that, when only general taxes are considered, Ireland does not belong to the continental group, while Portugal belongs to the central group due to the taxation on social transfers.

7. Conclusions

In general, the level of net expenditure does not appear to be the exclusive explanatory variable for the different results that characterise the social sector in the different countries considered. Essentially similar levels of net expenditure are often accompanied by a high degree of variability in performance, such as for Italy, Germany and Denmark. Furthermore, this variability of performance does not appear to be attributable to private participation in the social sector (which is not included in the figure for net social expenditure) which is in any case limited compared with public policies in all countries.

The performance of European countries seems to be connected to the scale and kind of public measures: countries with a higher public social expenditure/GDP ratio achieve a higher performance index if transfers are redistributive in nature. These characteristics, and thus also the performance level, are in line with the traditional classification of European welfare systems, the validity of which is confirmed from this perspective. If we consider a more complete set of indicators of the structure of welfare systems, irrespective of performance-related considerations, the traditional classification is no longer up to date. Indeed, with regard to the traditional four-way grouping of European welfare systems into Nordic, continental, Anglo-Saxon and Mediterranean systems, cluster analysis shows that, if only the expenditure side is considered, then neither a Mediterranean group as distinct from the continental group, nor an Anglo-Saxon group exists (or rather, the latter consists of the UK alone). With regard to the financing side, an Anglo-Saxon group exists, formed by the UK and Ireland, as does one that includes the Nordic countries as well as the continental countries. Considering expenditure-side indicators and financing-side indicators together three groups form: one comprising the UK and Iceland, one the Nordic countries and the Netherlands, one continental (and southern) countries and Ireland.

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APPENDIX

Table A1. Social expenditure sectors in the OECD database

Sectors	Cash benefits	Benefits in kind
Old age	Pensions	Residential care; home help services
Incapacity related*	Disability pensions	Residential care; home help services; rehabilitation services.
Health		Health care services, Prevention services, Drugs
Family	Family allowances, Maternity and Parental Leave, Transfers to lone parent families	ECEC, Home help
Labour Market	Start-up incentives	PES; Training for target groups
Unemployment	Unemployment compensation; severance pay; early retirement	
Other social policy areas (income maintenance and social assistance)	Income maintenance	Social assistance

*Eurostat data for incapacity related cash benefits.

Table A2. Net replacement rates: case 1 (67% AW) (2011)

	67% of AW					
	No children			2 children		
	Single person	One-earner married couple	Two-earner married couple	Lone parent	One-earner married couple	Two-earner married couple
Austria	55	57	79	71	73	85
Belgium	85	73	84	85	74	86
Czech Republic	65	65	88	67	67	88
Denmark	83	84	91	88	86	92
Finland	57	57	78	73	67	83
France	69	65	84	71	68	84
Germany	59	59	87	81	83	90
Greece	46	46	71	51	51	74
Iceland	76	77	88	82	80	90
Ireland	50	81	75	64	75	81
Italy	68	72	84	76	73	87
Luxembourg	83	82	90	89	89	93
Netherlands	76	77	84	67	81	78
Norway	67	69	84	79	74	86
Portugal	75	75	92	77	76	91
Slovak Republic	62	58	85	72	57	86
Spain	79	76	89	77	76	89
Sweden	66	66	83	74	70	84
UK	20	31	60	48	57	69

Source: OECD Benefits and wages statistics http://www.oecd.org/els/benefits-and-wages-statistics.htm

Table A3. Net replacement rate: case 2 (100% AW) (2011)

| | 100% of AW | | | | | |
| | No children | | | 2 children | | |
	Single person	One-earner married couple	Single person	One-earner married couple	Single person	One-earner married couple
Austria	55	56	76	68	69	81
Belgium	63	55	72	67	59	74
Czech Republic	65	65	84	70	67	88
Denmark	57	60	74	67	64	76
Finland	53	53	73	66	61	77
France	66	67	80	71	68	81
Germany	59	59	83	72	70	88
Greece	32	33	59	37	37	62
Iceland	61	66	77	69	71	80
Ireland	36	58	63	63	67	69
Italy	55	59	74	68	68	76
Luxembourg	85	83	89	92	89	92
Netherlands	75	77	83	68	80	78
Norway	65	66	79	77	69	81
Portugal	75	75	91	77	76	95
Slovak Republic	65	59	82	93	58	84
Spain	58	58	75	73	73	83
Sweden	46	46	68	55	51	70
United Kingdom	14	22	49	41	48	57

Source: OECD Benefits and wages statistics http://www.oecd.org/els/benefits-and-wages-statistics.htm

Table A4. Social expenditure by objective (anno 2011)

%GDP	Labour market	Inequality	Social exclusion
Austria	14,7	11,7	1,1
Belgium	15,4	12,8	1,1
Czech Republic	10,9	8,7	0,6
Denmark	12,1	16,3	1,7
Finland	14,5	12,5	1,4
France	16,9	12,7	1,7
Germany	13,2	11,5	0,9
Iceland	4,2	11,8	2,3
Ireland	10,1	10	2,3
Italy	16,8	9,9	0,8
Netherlands	8,9	12,8	1,7
Norway	8,1	12,7	1
Portugal	15,2	8,9	0,6
Slovak Republic	8,9	8,7	0,6
Spain	15,5	10,1	0,9
Sweden	10,4	15,6	1,2
United Kingdom	6,1	12,8	4
%Gross Social Public Expenditure	Labour market	Inequality	Social exclusion
Austria	0,528777	0,420863	0,039568
Belgium	0,52381	0,435374	0,037415
Czech Republic	0,542289	0,432836	0,029851
Denmark	0,404682	0,545151	0,056856
Finland	0,510563	0,440141	0,049296
France	0,539936	0,405751	0,054313
Germany	0,515625	0,449219	0,035156
Iceland	0,230769	0,648352	0,126374
Ireland	0,450893	0,446429	0,102679
Italy	0,610909	0,36	0,029091
Netherlands	0,378723	0,544681	0,07234
Norway	0,369863	0,579909	0,045662
Portugal	0,615385	0,360324	0,024291
Slovak Republic	0,489011	0,478022	0,032967
Spain	0,578358	0,376866	0,033582
Sweden	0,383764	0,575646	0,04428
United Kingdom	0,266376	0,558952	0,174672

Source: Analysis of OECD data.