

# The Impact of Public Services Expenditure on the Spanish Income Distribution

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**Abstract** This paper performs an assessment and imputation of the benefits produced to the individuals and households well-being by the public services provision. This analysis is very relevant in the current framework of economic crisis of the European economies. Although most of the papers in the literature compare countries, decentralization processes are included in this paper by accounting the effect of public expenditure on regional health care and education upon the levels of inequality and rates of poverty in each Spanish region. This case is relevant because of the high decentralization degree of the Spanish political structure and the persistent regional disparities. The results show a clear downward tendency in both phenomena following imputation, although education shows a greater impact. Furthermore, a decomposition, used in this context for the first time, of the effects shows the very relevant redistributive effect of this public expenditure.

**Keywords** Well-being · Poverty · Income distribution · In-kind benefits · Inequality · Public services

**JEL Classification** I32 · I24 · I14

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## 1 Introduction

The usual measurement of poverty and inequality in developed countries is based on monetary income, and more specifically on a proportion of the median of the net income perceived in the previous year. However, this approach omits the benefit in kind that services provided by the Public Administrations, such as health or education, produce in the well-being of households and individuals. Besides, the inclusion of these benefits in the poverty and inequality analysis is justified by some authors based on taxes. Given that these services are financed through the taxes on the monetary income used to measure inequality and poverty, the “dividend” received from these taxes must be taken into account.

Although this issue is very relevant and interesting in every developed country, as one can find in the last surveys from OECD or in many examples that incorporate the benefit in kind of certain public services to the analysis of income distribution (Aaberge and Langørgen 2006; Callan and Keane 2006; Caussat et al. 2005; Jones et al. 2008; Garfinkel et al. 2006; Harding et al. 2006; Marical et al. 2008; Paulus et al. 2009; Verbist et al. 2012), the analysis is focused on Spain in this paper. It is used as an example because a very fast decentralizing process has happened there from the central administration to the regions. At the same time, the persistent regional disparity observed in Spain in recent decades, in terms of poverty and inequality, is clear. Therefore, both phenomena cause that analysing how regional governments’ decisions about public expenditure can improve the households’ actual well-being.

Two forces underlie this process, acting in opposite directions. While decentralization is justified by the better adjustment of the regional levels of provision to distinct preferences, the constitutional guarantee of a minimum level of provision of these services throughout the national territory represents a limit to the abovementioned diversity. On the one hand, the guarantee of a minimum level of (basically health and education) provision might indicate that, on incorporating those public services to household incomes, levels of inequality and poverty should not increase but decrease. Yet on the other hand, regional governments have the power to give greater support to certain services, to the detriment of others, and can therefore tend towards the regional differentiation of these services and the corresponding imputed income.

When evaluating the effects of decentralization on the provision of public services discussed by Solé-Ollé (2009), some partially comparable precedents are commented upon; these analyse how decentralization affects services such as health (Costa-Font and Rico 2006), or social assistance benefits (Ayala et al. 2001). In the first case, the authors affirm that territorial inequalities do not appear to increase “in results”, and with regard to the second, anti-poverty benefits, being a competence totally transferred to the regional administrations and one for which there exists no legal framework requiring their equalisation, display a very high degree of inequality between the richest Autonomous Communities and those with less resources.

There is a long discussion about how to measure and assess the benefits of publicly-provided goods or services to individuals. If these goods or services would be market-based, it is easy to assume that the prices paid by every consumer would reflect underlying values and it would be possible measuring welfare by mixing prices and quantities. However, it is quite difficult to use prices to value public services because they are usually pure public goods and, thus, these services are assumed as free-provided and they benefit the whole society.

The different approaches to measuring benefit incidence can be found in the well-known classification proposed by DeWulf (1981):

- The “impact incidence” or “monetary flow” approach: In this case, one studies who receives each payment from the public sector, but the distribution of services among the population receives no attention. Therefore, in this analysis the public expenditure in education wages would be imputed to workers instead of students or their families.
- The “normative or legal incidence”: This is the predominant approach in the literature that studies who benefit from public expenditure. Therefore, if one follows this approach, the share of population who have increased their income because of a given expenditure without any direct compensation has to be determined.
- The “relative prices or expenditure incidence”: The effects of public expenditure on the prices of products and production factors are analysed in this approach.
- The “benefit incidence”: This proposal tries to assess the real or effective benefit received by people. That is, it is an extension of the second one because it search who benefits from public expenditure. However, instead of imputing the provision cost to the beneficiaries and using income increases as an approximation to well-being, this approach considers well-being as the analysed variable and so, the redistributive evaluation is performed upon utility instead of income.

The “normative incidence” approach is followed in this paper to estimate the distributive effects of education and health public expenditures on health and education. It is based on the assumption that the benefits from public expenditure are equal to the provision cost because there are no market prices for these public services and the individuals’ willingness to pay for them is also unknown. Therefore, provision costs for each public service will be computed and imputed to the beneficiaries. Once household incomes include these benefits, inequality and poverty indicators are computed.

Besides, the temporal dimension is introduced in the analysis by replying it in 2005 and 2010. These dates allow one to compare the effects before and after the economic crisis that begun in 2007. Since the changes in poverty impacts of public expenditure can be caused by an average expenditure increase/decrease or by changes in how the expenditures are distributed among the population, a decomposition so far used in pro-poor analysis of economic growth is applied in order to distinguish between expenditure growth and redistribution.

Previously, some papers were published in Spain to understand the effects of public expenditure undertaken in Spain from the end of the 1980s onwards (Bandrés Moliné 1990; Gimeno 1993; Medel et al. 1990, 1988). Such studies estimate the distribution of expenditure among households or individuals by income levels. Since the studies mentioned above, published in the early 1990s, diverse analyses of the effect of public expenditure in general, and public expenditure on health and education in particular, have been made. With regard to health, mention can be made of studies<sup>1</sup> such as that by Abásolo (1998), Calonge and Manresa (1997, 2001) or Calero Martínez (2001) who, despite using the same concept of effect, adopt different methodological options, which produce inconsistent results. For example, while Gimeno (1999) shows that health expenditure is the most redistributive sector of public expenditure, Ortiz et al. (1999) estimate that the top income quintiles appear to receive the greatest benefit from health expenditure, once certain individual characteristics have been controlled for. More recent papers on education are

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<sup>1</sup> Navarro and Hernández (2004) offer a review of the studies of the effect of health expenditure published in Spain.

Patiño (2010) or Calero and Izquierdo (2014). The main differences between the latter and this article lies in the methodological ground. While the analysis in Patiño (2010) is based in household expenditure instead of income, Calero and Izquierdo do not analyse poverty and there is no territorial decomposition in their paper.

The present study is structured as follows. Section 2 presents the methodology used in the process of imputation. Later, the results obtained are presented and explained in Sect. 3. In Sect. 4, changes between 2005 and 2010 are analysed and decomposed. Lastly, the conclusions gather and summarise the main issues arisen from the article.

## 2 Methodology and Data

Without a doubt, the extremely wide range of methodological options in the topic studied in this paper has meant that it has not been frequently incorporated into the analysis of inequality and poverty. The study of the impact of public expenditure on inequality and poverty has traditionally been limited to benefits or transfers, as they are a source of income for households and individuals and, consequently, an additional monetary variable. Thus, the incidence analysis of social transfers is easier because it consists of comparing income before and after transfers. By contrast, topics such as the evaluation of services or their imputation to a specific household member complicate the analysis.

Among these theoretical and methodological questions one can find (Marical et al. 2008):

1. The dynamic aspect of the benefits provided by governments: the impact of public services is not limited to a specific moment in the life of individuals, since it can be extended over time. For example, the benefit of education is not limited to the period in which an individual is in the education system, but instead extends to the long term, as his or her future earnings are increased. Most of the performed studies are focused on a static point of view, given the difficulty of estimating such effects.
2. The scope of benefits: they do not affect only the individual, but also society as a whole. For instance, improvement in the education level in a region caused an additional and indirect effect in each citizen separately although they have not received the benefit. Once more, it is complicated to estimate these external effects, and thus most of studies omit them.
3. The evaluation of services: it is not generally possible to assess public services via their market price, as it is explained in the introduction. There are several methodological options to determine their value. While, on one hand, the most usual alternative is the use of the production costs of services, other authors propose as assessment the amount that individuals should pay if they acquired these services in the market, or the one they would be willing to pay for them.
4. The distribution of public expenditure among individuals: since information regarding the real use of services by citizens does not appear in the databases usually used in income distribution analyses, it is necessary to perform an imputation, with the consequent error or bias. While for education the imputation is rather simple, since only households where there is a child or young person are taken into account, in the case of health it is necessary to consider more information. For this service, most of studies base their distribution process on a set of personal and family characteristics, because it is assumed that individuals with the same characteristics have the same probability of requiring health services. For example, the Informe sobre el Gasto

Sanitario (Health Expenditure Report) in 2005 undertook an empirical analysis that is used later for the calculation of health expenditure requirements per population interval in this paper.

5. The unit of analysis: this dilemma between individual and household, already present in studies of inequality and poverty, is resolved by following the same criterion. Consequently, total household income is adjusted to its size and typology through equivalence scales. This option only poses problems when the impact of higher education is analysed in countries such as Finland or Netherlands, where the majority of students at that education level live independent of their family, since the value of the service would not be assigned to the person who really receives the benefit (the student), but to his or her family.

There are two fundamental approaches in the literature to undertake the necessary imputation process. The first of these is based on microdata from surveys made of individuals and households (in Spain, Survey on Income and Living Conditions—SILC), increasing their respective income by the value of the services received. When analysing inequality following this approach it is possible to reorder households and individuals.

By contrast, this re-ranking is not possible when the alternative imputation is applied, based on grouped income data (generally deciles or quintiles), where the average income of the group is increased by incorporating, as in the previous case, the estimation of the in kind benefit received by using the service.

Given that the first option has been followed in the estimations performed in the present study, the starting point has been total annual net household income, adjusted by the modified OECD equivalence scale in order to reflect the distinct needs derived from household size and type. Afterwards, this adjusted income was assigned to each individual in the sample.

The data employed come, in the case of income, from the SILC for 2006 and 2010. This survey was created by EUROSTAT with the aim of allowing the comparability of results among the Member States of the European Union. Specifically, the objective was to have a source that would allow comparison of income and social exclusion in the European context. To achieve this, harmonisation has been performed, as far as possible, of questionnaires, data collection, codification and weighting schemes. After an analysis of prior validation to eliminate extreme values, the sample employed in the study contains 36,661 and 36,230 observations, respectively, since the individual is used as the unit of analysis. In addition to income, this database contains information on the personal characteristics used in the imputation.

While for education the imputation procedure has been based on real use by individuals, in the case of health care a criterion of estimation or insurance policy has been followed. Therefore, changes in inequality and poverty are due, on the one hand, to different values of public expenditure in each region and, on the other, to their distribution among individuals according to their characteristics.

The sources used to determine the provision costs of the public services<sup>2</sup> used in the imputation procedure corresponding to the year 2006 come from the Health Expenditure Report 2005 and the Public Expenditure Statistics for Education from the same year.<sup>3</sup>

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<sup>2</sup> The Annex offers data on health expenditure per person, the protected population, expenditure per student and the number of students for each region in 2005 and 2009.

<sup>3</sup> While the data on education expenditures are related to the calendar year, the data on students by education level are related to the academic year. Therefore, the number of students in 2005 is computed by the weighted average of students in the academic year 2004–2005 and 2005–2006.

Inequality and poverty analyses have been performed by applying the standard indicators in the literature. While in the first case the Gini index has been used, in the second, after establishing the threshold at 60 % of the median equivalent income, the FGT index, proposed by Foster et al. (1984), has been selected to measure poverty:

$$FGT(\alpha) = \frac{1}{n} \sum_{i=1}^q \left( \frac{z - y_i}{z} \right)^\alpha, \text{ with } \alpha \geq 0 \quad (1)$$

where  $y$  is income,  $z > 0$  is the poverty line and  $n$  is the number of individuals comprising the population. When  $\alpha = 0$  the FGT index is equal to the poverty rate and when  $\alpha = 1$  it is equivalent to the poverty rate multiplied by the poverty gap. Thus, FGT0 measures the extension of poverty and FGT1 is normally used to measure intensity.

### 3 Results

This section presents the initial estimations of the impact of public expenditure in health and education on inequality and poverty.

#### 3.1 Education

This service is imputed based on real use by individuals. Consequently, the first task is to determine whether the household includes a child or young person who is studying, and subsequently household income is increased by a amount equal to the public expenditure per student at each educational level, multiplied by the number of beneficiaries at each level present in the household.

The characteristics of the database imply that the setting of beneficiaries in the household follows a dual path. Firstly, the adult data file for those aged 16 or over is used. Given that the information regarding public expenditure on education gathers all secondary education (both Obligatory Secondary Education and the Bachillerato—equivalent to British A-levels) and Vocational Training, those individuals who state they are studying at one of the those levels at survey time are selected.

For children under 16, the information gathered in the individuals' datafile is used. In addition to their age, there is information about the number of hours that children of 12 or under have been in an infant education centre or in an obligatory education centre (primary or secondary) in a normal week. By combining these variables, it is possible to know how many children in each household attend some level of the education system. The only group that could present problems is composed by children between 13 and 16. Since because of their age they must attend school, it is assumed that they are in the first level of Obligatory Secondary Education (ESO).

When analysing these data, one should be cautious because the information available does not distinguish the legal status of the education centre. However, the private centres are those where education is privately provided, namely, schools that receive no public subsidies, which only represent 4.26 % of Spanish schools.

Reviewing the impact on inequality of expenditure on infant and primary education, Table 1 shows a clear tendency towards reduction (approximately 2.7 % for Spain), much sharper in those regions with greater poverty rates.

At the other extreme, the case of Madrid stands out, which despite of having one of the highest initial rates of inequality, displays a very low effect of education expenditure on

**Table 1** Inequality 2006 before and after including expenditure on infant and primary education

Region	Monetary income	Monetary income plus infant and primary education	Difference (in percentage rates) (%)
1: Andalusia	0.3182	0.3075	-3.38
2: Aragón	0.2788	0.2758	-1.09
3: Asturias	0.2794	0.2742	-1.88
4: Balearic Islands	0.2976	0.2897	-2.67
5: Canary Islands	0.3261	0.3117	-4.41
6: Cantabria	0.2892	0.2816	-2.61
7: Castile and Leon	0.3233	0.3138	-2.96
8: Castile-La Mancha	0.3089	0.2976	-3.68
9: Catalonia	0.2839	0.2782	-2.03
10: Valencian Community	0.2808	0.2747	-2.18
11: Extremadura	0.3314	0.3149	-4.99
12: Galicia	0.2980	0.2894	-2.87
13: Madrid	0.3132	0.3072	-1.92
14: Murcia	0.2914	0.2818	-3.29
15: Navarre	0.2839	0.2775	-2.24
16: Basque Country	0.2666	0.2600	-2.46
17: Rioja (La)	0.2710	0.2654	-2.07
Spain	0.3105	0.3022	-2.67

Source Authors' elaboration

inequality, perhaps derived from the percentage of students in privately provided schools. It must be taken into account that the percentage of private schools, which receive no subsidies, is by far the largest of all Spanish regions. Furthermore, it occupies that leading position at all educational levels excepting the tertiary one, which is outside the scope of this study. Specifically, the weight of these centres in Madrid is 27.1 %, as against 11.1 % national in infant education. In primary education, it is also in the first position, with 12.7 % against 3.9 % nationally. The same occurs in the ESO, where in Madrid private schools that receive no subsidies account for 11.7 %, compared to the Spanish average of 3.6 % and in the second stage of secondary education where it occupies this same first position, with 24.9 % against 11.5 % nationally.<sup>4</sup>

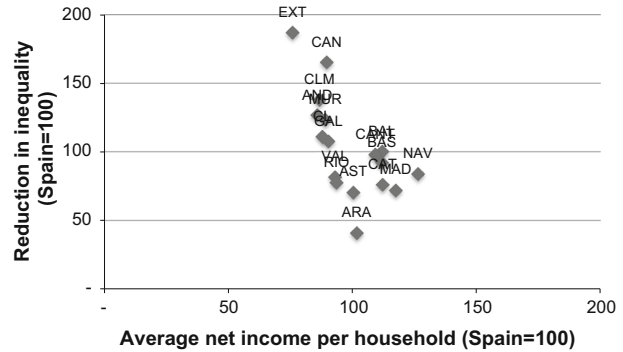
An alternative cause may be that the average income in Madrid is far higher than the national average, or the family structure.

Figure 1 shows that, except for Valencia and La Rioja, there is a negative relationship between the relative reduction (with regard to the average of 100) and the average net relative income (average = 100) in all the regions. This result confirms that the initial average relative income level is a factor to be taken into account when explaining the reduction in inequality produced by this public service.

With regard to poverty (Table 2), expenditure at this educational level appears to have a lesser effect, as the beneficiaries are above all certain regions with a low number of students, such as Cantabria, Navarre or La Rioja. Furthermore, a clear tendency is not

<sup>4</sup> Source: Institute of Evaluation. State system of education indicators. 2011 edition. The previous data correspond to the academic year 2008–2009. <http://www.mecd.gob.es/inee/sistema-indicadores.html>.

**Fig. 1** Reduction in inequality (after introducing infant and primary education) and average income. *Source* Authors' elaboration



**Table 2** Poverty 2006, before and after including expenditure on infant and primary education

Region	Monetary income (%)	Monetary income plus infant and primary education (%)	Difference (in percentage rates) (%)
1: Andalusia	29.54	28.17	-4.64
2: Aragón	12.94	13.48	4.17
3: Asturias	13.14	13.31	1.29
4: Balearic Islands	11.48	12.13	5.66
5: Canary Islands	28.25	28.09	-0.57
6: Cantabria	13.30	10.24	-23.01
7: Castile and Leon	24.46	24.12	-1.39
8: Castile-La Mancha	27.74	27.15	-2.13
9: Catalonia	12.18	11.50	-5.58
10: Valencian Community	17.08	16.92	-0.94
11: Extremadura	38.56	36.60	-5.08
12: Galicia	23.38	21.65	-7.40
13: Madrid	12.94	12.39	-4.25
14: Murcia	26.42	25.95	-1.78
15: Navarre	9.76	8.62	-11.68
16: Basque Country	9.80	9.13	-6.84
17: Rioja (La)	20.71	18.79	-9.27
Spain	19.82	19.00	-4.14

*Source* Authors' elaboration

observed in the regions with the highest rates of monetary poverty. The Canary Islands or Murcia do not follow the clear tendency of other territories such as Andalusia, Extremadura and Galicia.

Lastly, it is interesting to distinguish between infant and primary education for both poverty and inequality. While the latter is compulsory so that it represents a certain commitment for regional governments, the former presents some regional differences that remain hidden when both levels are grouped together. Furthermore, greater expenditure at this educational level would produce the external effect of improving the conciliation of working and family life and also encouraging female participation in the labour force.



**Table 3** Inequality 2006, before and after including expenditure on secondary education and vocational training

Region	Monetary income	Monetary income plus secondary education and vocational training	Difference (in percentage rates) (%)
1: Andalusia	0.3182	0.3079	-3.25
2: Aragón	0.2788	0.2732	-2.01
3: Asturias	0.2794	0.2684	-3.93
4: Balearic Islands	0.2976	0.2886	-3.03
5: Canary Islands	0.3261	0.3157	-3.20
6: Cantabria	0.2892	0.2801	-3.15
7: Castile and Leon	0.3233	0.3163	-2.17
8: Castile-La Mancha	0.3089	0.2991	-3.19
9: Catalonia	0.2839	0.2763	-2.71
10: Valencian Community	0.2808	0.2742	-2.37
11: Extremadura	0.3314	0.3169	-4.38
12: Galicia	0.2980	0.2922	-1.96
13: Madrid	0.3132	0.3071	-1.94
14: Murcia	0.2914	0.2845	-2.36
15: Navarre	0.2839	0.2746	-3.26
16: Basque Country	0.2666	0.2617	-1.82
17: Rioja (La)	0.2710	0.2651	-2.20
Spain	0.3105	0.3025	-2.56

Source Authors' elaboration

However, the official data for public expenditure on education in each Autonomous Community do not distinguish between both levels, and thus it is not possible to perform a differentiated analysis (Tables 3, 4).

Expenditure on secondary education and vocational training seems to produce an effect slightly lower than those observed in inequality when infant and primary education are considered. Nevertheless, leaving apart the case of Extremadura,<sup>5</sup> with a reduction close to double the national one, the reduction rates are very similar in almost all regions.

Otherwise, the impact on poverty is highly different among regions. While a sharp reduction in Cantabria and La Rioja can be observed, it is softer in Andalusia and Extremadura. In contrast, it increases slightly the poverty rate in other regions such as Castile-La Mancha, Madrid or the Canary Islands due to a statistical effect caused by changes in income distribution.<sup>6</sup>

<sup>5</sup> This is doubtless caused by the important difference between the average income in Extremadura and the national average.

<sup>6</sup> Since poverty after imputation is determined by the 60 % of the median equivalent extended income, the imputation of public education increases the poverty line. Therefore, some people living in households with no children and low income who are slightly above the line before fall below the threshold after imputation.

**Table 4** Poverty 2006, before and after including expenditure on secondary education and vocational training

Region	Monetary income (%)	Monetary income plus secondary education and vocational training (%)	Difference (in percentage rates) (%)
1: Andalusia	29.54	27.33	-7.48
2: Aragón	12.94	13.13	1.47
3: Asturias	13.14	11.92	-9.28
4: Balearic Islands	11.48	9.56	-16.72
5: Canary Islands	28.25	28.84	2.09
6: Cantabria	13.30	10.47	-21.28
7: Castile and Leon	24.46	23.44	-4.17
8: Castile-La Mancha	27.74	28.66	3.32
9: Catalonia	12.18	11.08	-9.03
10: Valencian Community	17.08	17.27	1.11
11: Extremadura	38.56	36.38	-5.65
12: Galicia	23.38	22.10	-5.47
13: Madrid	12.94	13.58	4.95
14: Murcia	26.42	25.87	-2.08
15: Navarre	9.76	8.28	-15.16
16: Basque Country	9.80	9.62	-1.84
17: Rioja (La)	20.71	17.82	-13.95
Spain	19.82	18.98	-4.24

Source Authors' elaboration

Finally, and as occurred with expenditure on infant and primary education, it would be desirable to distinguish between compulsory and non-compulsory education, with the aim of better differentiate the compulsory duties of the regional governments and the voluntary and additional efforts that those governments make to improve the educational level in their regions.

### 3.2 Health

In the imputation of this public service, it is not possible to follow the criterion of real use by individuals. In contrast to the European Community Household Panel (which in the health section gathers information about the individual health status and his/her visits to a primary care doctor, to a specialist and his/her stays in hospital), the SILC only contains information on health status and the impossibility of being attended to or receiving medical treatment.

Consequently, it is essential to use an “insurance premium” criterion, consisting of assuming that public expenditure is equivalent to financing an insurance policy in which the premium is the same for all those persons having the same characteristics, such as age, for example. The imputation performed in this paper has been based on the expenditure on health care per protected person in each region and the indices of expenditure by age group

**Table 5** Inequality 2006, before and after including expenditure on primary health care

Region	Monetary income	Monetary income plus primary health care	Difference (in percentage rates) (%)
1: Andalusia	0.3182	0.3155	-0.86
2: Aragón	0.2788	0.2766	-0.82
3: Asturias	0.2794	0.2776	-0.65
4: Balearic Islands	0.2976	0.2961	-0.52
5: Canary Islands	0.3261	0.3240	-0.66
6: Cantabria	0.2892	0.2875	-0.60
7: Castile and Leon	0.3233	0.3199	-1.07
8: Castile-La Mancha	0.3089	0.3061	-0.91
9: Catalonia	0.2839	0.2818	-0.76
10: Valencian Community	0.2808	0.2788	-0.72
11: Extremadura	0.3314	0.3273	-1.23
12: Galicia	0.2980	0.2960	-0.67
13: Madrid	0.3132	0.3118	-0.45
14: Murcia	0.2914	0.2892	-0.74
15: Navarre	0.2839	0.2820	-0.68
16: Basque Country	0.2666	0.2645	-0.80
17: Rioja (La)	0.2710	0.2689	-0.79
Spain	0.3105	0.3082	-0.72

Source Authors' elaboration

contained in the 2005 Health Expenditure Report, such that each individual has been assigned a benefit in kind equal to the regional expenditure per person, weighted by the index of his or her age group. After incorporating the individual benefits of all household members to its monetary income, this has been adjusted by applying the modified OECD equivalence scale (Tables 5, 6).

As one can expect in studying a service much more generalised than education—almost the entire population receives medical treatment at some point in the year, while the population out of school age rarely receives any education benefit—the effect is more uniform than in the previous section. Considering Spain as a whole, inequality falls by 0.72 % and the greater part of the regions show values very close to this. Castile and Leon and Extremadura stand out, with values exceeding one, mainly caused by the ageing of their populations.

The lower effect of primary care expenditure on inequality appears again when analysing poverty, where although there is a reduction, this alleviation does not reach half that produced by education expenditure (Tables 7, 8).

By contrast, expenditure on specialised care, comprising external consultations with specialists and hospital expenditure, appears to cause very significant reductions in both the inequality indices and poverty rates. Nevertheless, this result requires a more detailed and cautious imputation, to incorporate the effects of household income and the greater unit expenditure of specialised attention.

**Table 6** Poverty 2006, before and after including expenditure on primary health care

Region	Monetary income (%)	Monetary income plus primary health care (%)	Difference (in percentage rates) (%)
1: Andalusia	29.54	29.15	-1.32
2: Aragón	12.94	12.48	-3.55
3: Asturias	13.14	12.81	-2.51
4: Balearic Islands	11.48	11.26	-1.92
5: Canary Islands	28.25	27.72	-1.88
6: Cantabria	13.30	13.04	-1.95
7: Castile and Leon	24.46	24.30	-0.65
8: Castile-La Mancha	27.74	28.81	3.86
9: Catalonia	12.18	12.08	-0.82
10: Valencian Community	17.08	16.94	-0.82
11: Extremadura	38.56	38.22	-0.88
12: Galicia	23.38	23.25	-0.56
13: Madrid	12.94	12.76	-1.39
14: Murcia	26.42	26.00	-1.59
15: Navarre	9.76	9.60	-1.64
16: Basque Country	9.80	9.68	-1.22
17: Rioja (La)	20.71	20.05	-3.19
Spain	19.82	19.55	-1.36

Source Authors' elaboration

**Table 7** Inequality 2006, before and after including expenditure on specialised care

Region	Monetary income	Monetary income plus specialised care	Difference (in percentage rates) (%)
1: Andalusia	0.3182	0.3077	-3.31
2: Aragón	0.2788	0.2660	-4.61
3: Asturias	0.2794	0.2688	-3.80
4: Balearic Islands	0.2976	0.2893	-2.79
5: Canary Islands	0.3261	0.3161	-3.07
6: Cantabria	0.2892	0.2805	-3.01
7: Castile and Leon	0.3233	0.3084	-4.62
8: Castile-La Mancha	0.3090	0.2949	-4.56
9: Catalonia	0.2839	0.2755	-2.98
10: Valencian Community	0.2808	0.2713	-3.41
11: Extremadura	0.3314	0.3187	-3.85
12: Galicia	0.2980	0.2862	-3.97
13: Madrid	0.3132	0.3037	-3.03
14: Murcia	0.2914	0.2801	-3.89
15: Navarre	0.2839	0.2749	-3.16
16: Basque Country	0.2666	0.2558	-4.04
17: Rioja (La)	0.2710	0.2608	-3.78
Spain	0.3105	0.3002	-3.32

Source Authors' elaboration

**Table 8** Poverty 2006, before and after including expenditure on specialised care

Region	Monetary income (%)	Monetary income plus specialised care (%)	Difference (in percentage rates) (%)
1: Andalusia	29.54	27.82	-5.82
2: Aragón	12.94	10.89	-15.84
3: Asturias	13.14	10.94	-16.74
4: Balearic Islands	11.48	10.94	-4.70
5: Canary Islands	28.25	10.91	-61.38
6: Cantabria	13.30	11.12	-16.39
7: Castile and Leon	24.46	22.02	-9.98
8: Castile-La Mancha	27.74	25.83	-6.89
9: Catalonia	12.18	11.24	-7.72
10: Valencian Community	17.08	15.19	-11.07
11: Extremadura	38.56	36.47	-5.42
12: Galicia	23.38	21.22	-9.24
13: Madrid	12.94	11.56	-10.66
14: Murcia	26.42	24.65	-6.70
15: Navarre	9.76	8.45	-13.42
16: Basque Country	9.80	9.18	-6.33
17: Rioja (La)	20.71	18.66	-9.90
Spain	19.82	18.13	-8.53

Source Authors' elaboration

### 3.3 Combined Analysis

Having done the analysis of both services by functions, it is relevant to study the impact of whole public expenditure in education, health, and, finally, the total public expenditure in both services.

As one can expect by following the partial analyses, the direct effects of public expenditure on inequality and poverty in public education and health care are very relevant, above all in those regions more unequal and poor before imputation.

Thus, the effort made by the regional governments to improve the welfare of their citizens through benefits in kind when receiving a specific service, should be taken into consideration by the central tax administration when the development of their functions and the compliance with the principle of equality has to be evaluated. Therefore, it must not be forgotten that the effort in expenditure of the regional administrations is only a part of the reported expenditure since the financing of those services are guaranteed by the central administration (Tables 9, 10).

It is possible to affirm, with the caution derived from the employed methodology, that this action of the public authorities reduces inequality by 9 per cent and the poverty rate by slightly over 3.5 % points (changing from 19.82 to 16.14 %, that is, almost 1.6 million individuals exit from the population considered as poor).

**Table 9** Inequality 2006, before and after including expenditure on public services

Region	Income	+ Educ.	Dif. (in rates) (%)	+ Health	Dif. (in rates) (%)	+ Educ. and health	Dif. (in rates) (%)
1: Andalusia	0.3182	0.2977	-6.46	0.3053	-4.07	0.2849	-10.47
2: Aragón	0.2788	0.2704	-3.03	0.2640	-5.33	0.2554	-8.43
3: Asturias	0.2794	0.2633	-5.78	0.2672	-4.36	0.2508	-10.22
4: Balearic Islands	0.2976	0.2810	-5.58	0.2879	-3.27	0.2713	-8.85
5: Canary Islands	0.3261	0.3022	-7.33	0.3142	-3.66	0.2907	-10.86
6: Cantabria	0.2892	0.2725	-5.77	0.2790	-3.53	0.2623	-9.29
7: Castile and Leon	0.3233	0.3073	-4.98	0.3054	-5.54	0.2892	-10.55
8: Castile-La Mancha	0.3089	0.2885	-6.63	0.2924	-5.35	0.2719	-12.01
9: Catalonia	0.2839	0.2708	-4.64	0.2735	-3.67	0.2604	-8.30
10: Valencian Community	0.2808	0.2684	-4.42	0.2694	-4.06	0.2570	-8.49
11: Extremadura	0.3314	0.3020	-8.87	0.3152	-4.89	0.2857	-13.81
12: Galicia	0.2980	0.2838	-4.77	0.2844	-4.56	0.2699	-9.40
13: Madrid	0.3132	0.3014	-3.76	0.3024	-3.44	0.2907	-7.17
14: Murcia	0.2914	0.2754	-5.49	0.2781	-4.54	0.2622	-10.00
15: Navarre	0.2839	0.2692	-5.19	0.2732	-3.77	0.2585	-8.95
16: Basque Country	0.2666	0.2554	-4.20	0.2539	-4.75	0.2426	-9.01
17: Rioja (La)	0.2710	0.2592	-4.36	0.2589	-4.48	0.2469	-8.91
Spain	0.3105	0.2947	-5.08	0.2981	-3.97	0.2824	-9.03

Source Authors' elaboration

**Table 10** Poverty 2006 before and after including expenditure on public services

Region	Income (%)	+ Educ. (%)	Dif. (in rates) (%)	+ Health (%)	Dif. (in rates) (%)	+ Educ. and health (%)	Dif. (in rates) (%)
1: Andalusia	29.54	26.87	-9.04	27.53	-6.80	25.06	-15.17
2: Aragon	12.94	14.24	10.05	10.69	-17.39	11.64	-10.05
3: Asturias	13.14	11.31	-13.93	10.66	-18.87	8.57	-34.78
4: Balearic Islands	11.48	9.88	-13.94	10.68	-6.97	8.44	-26.48
5: Canary Islands	28.25	26.38	-6.62	26.40	-6.55	24.21	-14.30
6: Cantabria	13.30	8.36	-37.14	11.12	-16.39	7.02	-47.22
7: Castile and Leon	24.46	23.70	-3.11	21.55	-11.90	20.45	-16.39
8: Castile-La Mancha	27.74	26.34	-5.05	25.59	-7.75	22.58	-18.60
9: Catalonia	12.18	10.67	-12.40	11.12	-8.70	8.74	-28.24
10: Valencian Community	17.08	16.70	-2.22	14.97	-12.35	14.36	-15.93
11: Extremadura	38.56	35.05	-9.10	36.30	-5.86	31.42	-18.52
12: Galicia	23.38	20.58	-11.98	21.18	-9.41	17.95	-23.22
13: Madrid	12.94	12.25	-5.33	11.39	-11.98	11.52	-10.97
14: Murcia	26.42	23.87	-9.65	24.13	-8.67	21.24	-19.61
15: Navarre	9.76	8.47	-13.22	8.39	-14.04	7.25	-25.72
16: Basque Country	9.80	9.19	-6.22	8.61	-12.14	7.63	-22.14
17: Rioja (La)	20.71	17.67	-14.68	18.66	-9.90	15.8	-23.71
Spain	19.82	18.32	-7.57	17.91	-9.64	16.14	-18.57

Source Authors' elaboration

## 4 Dynamic Analysis

The significant results observed in 2006 make it more attractive to repeat the study for the micro data from the 2010 SILC. This broadening is interesting not only to update the analysis, but also because it incorporates the impact of the economic crisis into the living conditions of the Spanish population. This phenomenon started in the last quarter of 2008 and seriously affected the Spanish economy during the year 2009. It must be reminded that the income that appears in each wave of the survey is the total income of the year prior to that of the survey, and thus these data correspond to the onset of the crisis and a comparison between two periods, before the crisis and its starting point, can be developed. This change in the economic context is combined with a very noticeable social transformation, namely the increase in the population in most of the regions caused by immigration. Due to this population increase, the basic public services, health and education, included in this study, have undergone an increasing demand, especially education. Both phenomena, the economic crisis and the increase in population (very unequally distributed among the regions), make the proposed analysis more adequate.

The two foregoing Tables 11 and 12, show the result of the updating. Both inequality and poverty have increased by approximately 8 % in aggregate terms in these 4 years. It can be demonstrated, moreover, that the regions that always suffer the worst situations with the rest remaining in the same relative situation do not produce this increase. On the contrary, it is possible to observe that almost all the regions have worsened their situation. Among these, the Valencian Community and the Balearic Islands stands out, as territories where both phenomena have revitalised, and Murcia, with an even greater change.

Likewise, the process of imputing public expenditure on health and education to the sample households has been replicated. With regard to education, the information provided by the Ministry of Education, Culture and Sport regarding real expenditure and students registered for the academic years 2008–2009 and 2009–2010 has been used, from which is determined regional expenditure per student for the year 2009. The imputation procedure is the same used before for the year 2006, and thus it makes no sense to make additional comments on this point.

By contrast, variations have been produced in the procedure for imputing health expenditure. Although the “insurance premium” approach has been maintained, as the series of Health Expenditure Report has not been continued, official information was not available to impute (in this case, by age) the average expenditure per protected person to individuals belonging to a household.

This problem was resolved by applying the results of Spadaro et al. (2011), who estimate public health expenditure by person, age group and function of the system from the micro data of the 2006 Annual Health Survey that follow the same approach employed in the present study. The expenditure per person estimated allows one the calculation of the relative indices of expenditure by age and function of the system, which are subsequently applied to the average expenditure per protected person and expenditure component, published by the Ministry of Health, Social Services and Equality for the year 2009.

In general terms, having undertaken the procedure of imputation of each benefit in kind, the results obtained for inequality and poverty describe the same panorama as in the previous simulation, namely an important downward effect. Furthermore, this effect



presents certain peculiarities: on the one hand, the impact of public expenditure on health is much more important, for both inequality and poverty and, on the other, the situation is generalised in the majority of the regions.

These results seem to be explained by the confluence of two opposite forces. While, as has been seen above, inequality and poverty in monetary terms have sharpened in the years in question, public expenditure per person on health and education has increased in the same period.

To determine how far the changes observed in poverty over time are due to the evolution of income or to the dynamics of inequality or redistribution, the procedure proposed by Datt and Ravallion (1992) and implemented in the *dfgtgr* module of the DASP v. 2.2 program for Stata is followed.

According to Datt and Ravallion (1992), the change in a FGT poverty index, from one period  $t_1$  to another  $t_2$ , can be decomposed into a component relative to growth and another corresponding to redistribution, in accordance with the following expression:

$$P_2 - P_1 = [P(\mu^2, \pi^1) - P(\mu^1, \pi^1)] + [P(\mu^1, \pi^2) - P(\mu^1, \pi^1)] + R. \quad (2)$$

where  $P(\mu^1, \pi^1)$  is the FGT index from the first period,  $P(\mu^2, \pi^2)$  e FGT index from the second period,  $P(\mu^2, \pi^1)$  the FGT index from the first period when all the income from this period is multiplied by  $\mu^2/\mu^1$  and, finally,  $P(\mu^1, \pi^2)$  is the FGT index from the second period when all the income from this period is multiplied by  $\mu^2/\mu^1$ .

In the expression above, the first addend denotes the part corresponding to growth and the second that regarding redistribution, while R is a residual component housing that part of the change inexplicable by either of the others.

To eliminate this residual component, the Shapley value can be applied, so that the variation over time can be decomposed as the sum of the “growth” and “redistribution” components:

$$\begin{aligned} P_2 - P_1 &= C_1 + C_2 \\ C_1 &= \frac{1}{2} ([P(\mu^2, \pi^1) - P(\mu^1, \pi^1)] + [P(\mu^2, \pi^2) - P(\mu^1, \pi^2)]) \\ C_2 &= \frac{1}{2} ([P(\mu^1, \pi^2) - P(\mu^1, \pi^1)] + [P(\mu^2, \pi^2) - P(\mu^2, \pi^1)]) \end{aligned} \quad (3)$$

Finally, to be able to apply this new decomposition to the study in either of its forms, it is necessary to use a single poverty line in the two periods. In this case, given that 2006 is used as the reference period, the poverty line of that year is taken as criterion. The income from the micro data for 2010 is deflated,<sup>7</sup> to work in real terms and avoid the distortion that inflation could introduce into the analysis.

The decomposition of the monetary rates of poverty show, firstly, that the differences observed in nominal terms are lesser in real terms. In fact, the difference between the two rates is not significant at 5 %.

Nevertheless, Table 13 contains interesting information when the decompositions are analysed. In both Datt–Ravallion and Shapley- approaches, the “growth” component is significant and has a negative sign. That is, if inequality had remained constant, the evolution of average income in this period made one expect a reduction in the poverty rate.

<sup>7</sup> To obtain the true values, the annual averages of the CPI are employed, by using 2011 as the base year, for the years 2005 and 2009, provided by the National Statistics Institute.

**Table 11** Inequality 2010, before and after including expenditure on public services

Region	Monetary income	+ Infant and primary education	Dif. (%)	+ Secondary education and vocational training	Dif. (%)	+ Primary health care	Dif. (%)	+ Specialised care	Dif. (%)
1: Andalusia	0.3622	0.3432	-5.24	0.3396	-6.22	0.3528	-2.58	0.3319	-8.35
2: Aragon	0.2678	0.2594	-3.13	0.2561	-4.37	0.2611	-2.49	0.2442	-8.79
3: Asturias	0.2855	0.2767	-3.07	0.2699	-5.43	0.2798	-1.97	0.2583	-9.50
4: Balearic Islands	0.3370	0.3112	-7.64	0.3168	-5.98	0.3299	-2.09	0.3101	-7.96
5: Canary Islands	0.3270	0.3078	-5.86	0.3037	-7.12	0.3187	-2.54	0.2961	-9.45
6: Cantabria	0.3108	0.2935	-5.56	0.2952	-5.02	0.3042	-2.13	0.2865	-7.81
7: Castile and Leon	0.3226	0.3115	-3.43	0.3071	-4.81	0.3132	-2.90	0.2966	-8.06
8: Castile-La Mancha	0.3453	0.3258	-5.64	0.3269	-5.32	0.3348	-3.04	0.3129	-9.38
9: Catalonia	0.3159	0.2996	-5.16	0.3030	-4.08	0.3094	-2.08	0.2988	-5.41
10: Valencian Community	0.3561	0.3388	-4.85	0.3399	-4.54	0.3494	-1.88	0.3306	-7.14
11: Extremadura	0.3479	0.3239	-6.89	0.3258	-6.38	0.3351	-3.69	0.3098	-10.96
12: Galicia	0.3069	0.2920	-4.88	0.2916	-5.00	0.3001	-2.25	0.2797	-8.91
13: Madrid	0.3123	0.3008	-3.67	0.3003	-3.84	0.3077	-1.48	0.2894	-7.34
14: Murcia	0.3681	0.3277	-10.98	0.3238	-12.05	0.3581	-2.72	0.3272	-11.11
15: Navarre	0.2677	0.2563	-4.25	0.2556	-4.54	0.2625	-1.93	0.2485	-7.16
16: Basque Country	0.2920	0.2799	-4.13	0.2774	-4.97	0.2857	-2.14	0.2683	-8.10
17: Rioja (La)	0.3156	0.2959	-6.25	0.3039	-3.71	0.3081	-2.40	0.2872	-9.00
Spain	0.3376	0.3207	-4.99	0.3204	-5.08	0.3300	-2.23	0.3115	-7.72
Region	Monetary income	+ Educ.	Dif. (%)	+ Health	Dif. (%)	+ Pub. Serv.	Dif. (%)		Dif. (%)
1: Andalusia	0.3622	0.3224	-10.98	0.3149	-13.05	0.2829	-21.90		
2: Aragón	0.2678	0.2484	-7.24	0.2316	-13.49	0.2154	-19.57		
3: Asturias	0.2855	0.2632	-7.78	0.2462	-13.74	0.2272	-20.41		
4: Balearic Islands	0.3370	0.2941	-12.73	0.2983	-11.46	0.2629	-21.99		

Table 11 continued

Region	Monetary income	+ Educ.	Dif. (%)	+ Health	Dif. (%)	+ Pub. Serv.	Dif. (%)
5: Canary Islands	0.3270	0.2874	-12.11	0.2808	-14.12	0.2493	-23.77
6: Cantabria	0.3108	0.2793	-10.15	0.2734	-12.02	0.2469	-20.55
7: Castile and Leon	0.3226	0.2975	-7.79	0.2792	-13.44	0.2586	-19.84
8: Castile-La Mancha	0.3453	0.3092	-10.44	0.2939	-14.86	0.2656	-23.06
9: Catalonia	0.3159	0.2879	-8.87	0.2856	-9.60	0.2616	-17.20
10: Valencian Community	0.3561	0.3238	-9.05	0.3143	-11.74	0.2875	-19.27
11: Extremadura	0.3479	0.3046	-12.46	0.2885	-17.09	0.2548	-26.77
12: Galicia	0.3069	0.2779	-9.45	0.2629	-14.38	0.2394	-22.02
13: Madrid	0.3123	0.2898	-7.19	0.2801	-10.29	0.2611	-16.39
14: Murcia	0.3681	0.2905	-21.09	0.3087	-16.16	0.2483	-32.55
15: Navarre	0.2677	0.2455	-8.28	0.2385	-10.91	0.2196	-17.97
16: Basque Country	0.2920	0.2674	-8.40	0.2566	-12.11	0.2363	-19.06
17: Rioja (La)	0.3156	0.2865	-9.21	0.2729	-13.51	0.2491	-21.06
Spain	0.3376	0.3052	-9.58	0.2965	-12.15	0.2699	-20.02

Source Authors' elaboration

**Table 12** Poverty 2010, before and after including expenditure on public services

Region	Monetary income (%)	+ Infant and primary education (%)	Dif. (%)	+ Secondary education and vocational training (%)	Dif. (%)	+ Primary health care (%)	Dif. (%)	+ Specialised care (%)	Dif. (%)
1: Andalusia	29.90	26.95	-9.87	27.37	-8.47	28.92	-3.26	27.79	-7.06
2: Aragón	12.92	12.34	-4.47	12.82	-0.74	12.37	-4.23	11.18	-13.42
3: Asturias	12.60	11.96	-5.10	10.85	-13.88	12.28	-2.54	10.40	-17.48
4: Balearic Islands	21.25	19.60	-7.79	21.04	-0.98	19.65	-7.56	17.24	-18.86
5: Canary Islands	31.25	27.44	-12.17	28.82	-7.78	30.05	-3.85	28.07	-10.16
6: Cantabria	15.04	15.28	1.60	15.73	4.62	13.85	-7.93	12.40	-17.53
7: Castile and Leon	19.43	20.09	3.40	17.96	-7.56	17.86	-8.05	16.05	-17.40
8: Castile-La Mancha	27.70	25.49	-7.95	24.83	-10.36	26.82	-3.17	23.75	-14.25
9: Catalonia	16.11	14.07	-12.67	15.39	-4.45	15.67	-2.69	15.60	-3.16
10: Valencian Community	20.48	18.99	-7.31	19.54	-4.60	20.21	-1.33	18.86	-7.94
11: Extremadura	38.11	32.34	-15.15	34.29	-10.03	35.44	-7.01	32.14	-15.66
12: Galicia	16.62	15.82	-4.76	15.17	-8.70	16.04	-3.48	14.04	-15.52
13: Madrid	13.41	13.51	0.79	11.96	-10.82	13.34	-0.51	11.43	-14.78
14: Murcia	31.54	28.75	-8.87	30.25	-4.10	31.29	-0.81	28.62	-9.26
15: Navarre	8.02	5.92	-26.19	7.39	-7.88	8.02	0.00	6.88	-14.20
16: Basque Country	11.92	10.55	-11.47	11.06	-7.26	11.81	-0.95	8.99	-24.62
17: Rioja (La)	21.00	17.74	-15.54	22.17	5.57	19.72	-6.12	18.22	-13.25
Spain	21.46	19.27	-10.20	19.47	-9.23	20.32	-5.27	18.77	-12.50
Region	Monetary income (%)	+ Educ. (%)	+ Health (%)	+ Pub. Serv. (%)	Dif. (%)				
1: Andalusia	29.90	25.60	26.23	21.23	-12.26				
2: Aragón	12.92	12.02	9.98	8.21	-22.74				
3: Asturias	12.60	11.29	9.99	6.78	-20.65				
4: Balearic Islands	21.25	17.96	17.24	16.13	-18.86				
5: Canary Islands	31.25	25.63	27.22	19.18	-12.90				

Table 12 continued

Region	Monetary income (%)	+ Educ. (%)	Dif. (%)	+ Health (%)	Dif. (%)	+ Pub. Serv. (%)	Dif. (%)
6: Cantabria	15.04	14.78	-1.74	11.30	-24.82	11.20	-25.50
7: Castile and Leon	19.43	17.58	-9.49	14.00	-27.93	12.31	-36.62
8: Castile-La Mancha	27.70	23.44	-15.38	20.15	-27.25	18.06	-34.78
9: Catalonia	16.11	13.23	-17.84	14.46	-10.21	11.49	-28.66
10: Valencian Community	20.48	18.50	-9.70	17.01	-16.93	14.41	-29.66
11: Extremadura	38.11	27.51	-27.83	28.24	-25.90	18.67	-51.00
12: Galicia	16.62	13.78	-17.07	11.80	-28.95	9.67	-41.80
13: Madrid	13.41	12.35	-7.92	11.24	-16.16	9.56	-28.70
14: Murcia	31.54	24.58	-22.08	26.72	-15.29	20.18	-36.02
15: Navarre	8.02	6.76	-15.70	5.87	-26.72	3.40	-57.54
16: Basque Country	11.92	9.48	-20.50	7.62	-36.04	7.29	-38.83
17: Rioja (La)	21.00	17.14	-18.37	16.62	-20.87	11.83	-43.69
Spain	21.46	17.86	-16.74	17.35	-19.15	14.06	-34.48

Source Authors' elaboration

**Table 13** Decomposition of the change in monetary poverty, 2010–2006

	Estimate
2006	0.1982
2010	0.1986
Difference: (d2–d1)	0.0003
Datt–Ravaillon approach: reference period 2006	
Growth	–0.0054*
Redistribution	0.0033
Residue	0.0025
Shapley approach	
Growth	–0.0042*
Redistribution	0.0045

Source: DASP v. 2.2

\* Significant at 5 %

**Table 14** Decomposition of the change in poverty with imputed public expenditure, 2010–2006

	Estimate
2006	0.1613
2010	0.0924
Difference: (d2–d1)	–0.0684*
Datt–Ravaillon approach: reference period 2006	
Growth	–0.0565*
Redistribution	–0.0258*
Residue	0.0134
Shapley approach	
Growth	–0.0498*
Redistribution	–0.0191*

Source: DASP v. 2.2

\* Significant at 5 %

What would happen if one considered the evolution of the poverty rate when the benefit in kind of public expenditure on education and health are taken into account? In an initial approximation and with the antecedents of the previous analyses more significant and important results are to be expected.

This *a priori* feeling is confirmed by the results in Table 14. Both the difference in the FGT poverty indices and the successive decompositions are significant. Despite of eliminating the effect of inflation, the relative importance of imputed public expenditure on health and education in reducing the risk of poverty is repeated.

The analysis of the decomposition shows the redistributive nature of public expenditure, widely covered in the literature, since it is clear in both approaches that, maintaining average income constant, the redistributive component would reduce the poverty rate by approximately 2 %.

However, this issue should be nuanced by the influence of the inequality observed previously in monetary income and the relevance of the expenditure increase per person on health and education. Thus, if inequality had remained constant, the FGT poverty index would have fallen by approximately 5 %, more than double than in the previous component.

The regional study of these decompositions confirms and repeats the results obtained at aggregate level, except in the Balearic Islands, where the poverty rate would have

increased although inequality were maintained and, if the evolution of average income were controlled, it would also increase.

## 5 Conclusions

The economic crisis suffered in the European Union has shown the relevance of studying household well-being in detail. Among the Member States, Spain stands out because of the unemployment rate increase and its economy suddenly reduced the growth rate stop. In this context, it is very adequate to consider the benefit in kind from the public expenditure in health and education that shows the governments' effort to alleviate poverty.

In addition, this paper is one of the first evaluations of the impact of the decentralisation of these services on territorial differences in well-being. Given the decentralization degree of Spanish public administration system and the persistence of regional income disparities in Spain, that feature becomes very important.

The imputation of expenditure on public services produces a very significant reduction of inequality and poverty in all the regions. This decrease is even sharper in the regions located at the lower tail of income distribution, allowing them to converge. Therefore, the results show an undeniable redistributive pattern. One can affirm that those benefits in kind have been clearly pro-poor. These regional patterns confirm the impact observed in the whole country distribution, as Calero and Izquierdo (2014) show.

The public health expenditure, as well as the one on public education, is progressive and redistributive. The latter seems to be more redistributive in terms of inequality than the former. However, health benefits are more important when the redistribution assessment is based on poverty. These differences are related to income distribution and the benefits incidence.

The redistributive role of public benefits in kind becomes larger when the 2010 imputation is analysed for health and education expenditures. Such increase in redistribution effects happens in a context of growing inequality and poverty rates because of the economic crisis. Since poverty and public services expenditure rose between 2006 and 2010, it would be very interesting to observe the evolution of poverty by differentiating between the increase of average public benefits and the changes in benefits incidence. A decomposition procedure proposed by Datt and Ravallion (1992) to assess if economic growth is pro-poor is used for analysing poverty changes between 2006 and 2010. The results reflect the impact of inequality because the slight increase of poverty in real terms is due to the "redistribution" component. However, when benefits in kind are taken into account, the reduction of poverty in real terms stands out, not only because of the "growth" component—public expenditure rising- but also by the incidence or distribution of benefits among the population. The latter phenomenon can be observed by means of the "redistribution" component.

Therefore, the decomposition shows how the public benefits provide a cushion against the initial effects of the Great Recession in poverty and households' well-being.

Finally, one should not forget that these services, health care and education, do not only answer to the citizens' needs, namely, a short-term point of view. Furthermore, a higher educational level and a better health status in a society are prerequisites for a better and greater well-being, present and future.

As well as the new poverty indicator based on imputed rent, it would be very important to include poverty and inequality indicators based on benefits in kind in order to describe a wider and deeper outlook of the well-being in society.

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