Redistribution in Spain through taxes (direct and indirect) and benefits (cash and in-kind): methodology and main results for 2021

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Abstract: The aim of this paper is to explain the main aspects of the "Observatory on the distribution of taxes and benefits among Spanish households", which FEDEA has been preparing and publishing since 2016. We describe the databases used, the taxes and benefits considered and the methodology employed to allocate them to households. For illustrative purposes, the results obtained for 2021 are presented in some detail and compared with those achieved for the period 2017-2021.

1. Introduction

Since 2016, FEDEA has been preparing and publishing the "Observatory on the distribution of taxes and benefits among Spanish households" (*Observatorio sobre el reparto de los impuestos y las prestaciones entre los hogares españoles*). The study covers households residing in the seventeen Spanish autonomous communities (including, therefore, the "foral communities" of Navarre and the Basque Country) and in the autonomous cities of Ceuta and Melilla.

The first report of the Observatory (referring to the fiscal year 2013) only estimated the distributional impact of taxes, including both direct taxes (including social contributions from workers and self-employed individuals) and indirect taxes. Corporate income tax and employers' social contributions were initially excluded from the Observatory. Subsequently, cash benefits were included in the second report (referring to the fiscal year 2014), followed by in-kind benefits in health and education, included in the fifth report, and finally, starting from the sixth report (referring to the years 2017 and 2018) also the two taxes mentioned above. After all these extensions, the Observatory provides a fairly complete picture of the redistributive effect of public intervention in Spain through taxes and benefits, which makes it one of the very small number of studies in the international literature that do so at present.

The aim of this paper is to explain the key aspects of the Observatory and to illustrate its results with data corresponding to the fiscal year 2021. To this end, Section 2 describes the micro-databases used, the taxes and benefits under study and the methodology used to impute them to households. Section 3 presents in some detail the results obtained for 2021 and compares them with those achieved for the period 2017-2021, which are the years for which we have comparable results, due to the homogeneity both in the definition of market income and in the taxes and benefits considered. Section 4 briefly concludes. The references include the publications that develop our methodology, as well as the reports published to date and the additional research derived from them.[1]

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[1] In López-Laborda, Marín and Onrubia (2022) we evaluate how taxes and benefits affect households at risk of poverty. In López-Laborda, Marín and Onrubia (2023b), we first analyse the impact of taxes and benefits by grouping households according to the age of their main income earner. In a second approach, we adopt a generational approach, analysing changes in the tax-benefit balance over the life-cycle of four representative household types, for a constant tax-benefit system. All the published reports and the data on which they are based are available on the Observatory's website: https://fedea.net/category/observatorio-impuestos/.

2. Databases, taxes and benefits covered, methodology

The main micro-database used in our Observatory is the Survey of Living Conditions (*Encuesta de Condiciones de Vida*, ECV), a representative sample of the nearly 20 million households residing in Spain, which constitute our unit of analysis.[2] The ECV offers detailed information on the composition of the household, the ages of its members, their occupation and the sources and amount of the income they obtain. These data allow us to calculate the household's market or primary income and to estimate how this is modified, first, by households receiving cash benefits (which gives rise to gross household income), then by the payment of taxes (obtaining disposable income) and, finally, by the imputation to households of public health and education services (to arrive at what we refer to as *extended disposable income*). All exercises are carried out both in monetary terms (the only ones to be presented in section 3) and by applying the modified OECD equivalence scale (whose results, just like the previous ones, are provided in an online annex on the Observatory's website).

The ECV provides information on all cash benefits received by households: public retirement and survivors' pensions (widowhood and orphanhood), unemployment transfers and subsidies, disability transfers, sickness transfers, student grants, social protection and assistance, and family and living transfers. The main problem here is to separate, in some cases, public and private programmes.[3]

With regard to taxes, the ECV includes household payments for the main direct taxes: Personal Income Tax (*Impuesto sobre la Renta de las Personas Físicas*, IRPF), Wealth Tax (*Impuesto sobre el Patrimonio*) and Social Security contributions paid by employees and the self-employed,[4] as well as those paid by companies on behalf of their workers. Employer contributions are considered part of employees' remuneration and are therefore added to the employees' market income. (Saez and Zucman, 2023).

Corporate Income Tax (*Impuesto sobre Sociedades*) is not included in the ECV, as this is not a tax directly paid by households. We have imputed it to households in the following way. First,

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[2] The Survey of Living Conditions (ECV) is the annual database for Spain of the European Statistics on Income and Living Conditions (EU-SILC), encouraged and coordinated by Eurostat. The ECV is produced and disseminated annually by the Spanish National Institute of Statistics (INE).

[3] In particular, unemployment transfers and subsidies are lumped together with private severance payments. We have separated them considering that the maximum amount received from the unemployment transfer is limited to the maximum subsidy established by law.

[4] IRPF withholding on wages and Social Security contributions paid by employees and the self-employed are also lumped together in the ECV. We carry out a simulation exercise to approximate the amounts paid as Social Security contributions and then estimate IRPF liability as a residual.

we have estimated the share of the profits of companies resident in Spain (whether distributed or not) and the share of corporate tax liability attributable each year to resident households, using aggregate information published by the Spanish Tax Administration Agency (AEAT). We then allocate these profits and the corresponding tax liability to households on the basis of an estimate of the dividends they report in the ECV (which are recorded together with other property income, such as interest payments). Since retained corporate profits are not reflected in the ECV, we have to increase the market income of the affected households by the amounts attributable to them (net of dividends, which are already included in their income along with other capital income), in line with the approach of Saez and Zucman (2023).

A major problem arises in the imputation of consumption taxes since, as in most EU countries, the ECV does not include household expenditure on consumer goods and services. The household consumption information does, however, appear in the Household Budget Survey (*Encuesta de Presupuestos Familiares*, EPF), which makes it necessary to carry out a statistical matching procedure of the two surveys, so that the amounts corresponding to the different spending items that make up their consumption basket are available for all ECV households. Once this matching has been carried out, we can calculate the tax paid by households for Value Added Tax (*Impuesto sobre el Valor Añadido*, IVA), Property Transfer Tax and Stamp Duty (*Impuesto sobre Transmisiones Patrimoniales y Actos Jurídicos Documentados*, ITPAJD), Insurance Premium Tax (*Impuesto sobre las Primas de Seguros*) and Excise Duties on Alcohol and Alcoholic Beverages, on Hydrocarbons, on Tobacco Products and on Electricity (*Impuestos Especiales sobre el Alcohol y las Bebidas Alcohólicas, sobre Hidrocarburos, sobre las Labores del Tabaco y sobre la Electricidad*).[5]

Understandably, in-kind health and education benefits do not appear in the ECV either, except for student grants, which are already included among the cash benefits. To estimate the amount to be imputed to each household for these items, the starting point for each year is the total budgetary cost executed, in consolidated terms, for all levels of government, in each of the categories of education and health spending and broken down by autonomous community, provided by the General Comptroller of the State Administration (*Intervención General de la Administración del Estado*, IGAE).[6] For the imputation of public health

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[5] The parametric methodology followed to allocate total household expenditure in the ECV is described in López-Laborda, Marín and Onrubia (2021a). The breakdown of this total expenditure into more than 40 categories of goods and services, as well as the microsimulation of all indirect taxes, is explained in López-Laborda, Marín and Onrubia (2016a).

[6] In Spain, the vast majority of responsibilities in healthcare and education are decentralised to the regional governments (autonomous communities).

expenditure outlays, we apply the insurance value approach.[7] Given the universal coverage of public healthcare in Spain, we consider all members of resident households as beneficiaries, regardless of whether they have used the services or not. Nevertheless, the individual expenditure allocation to household members considers their age and sex, according to the available aggregate-level information on the intensity of use of healthcare services. As for the imputation of public expenditure on education, we follow the actual consumption approach, based on the identification in the ECV households of the effective users of the service at each of the educational levels which is contemplated in the study.[8]

3. Main results

In this section, we present the main results achieved for the year 2021, the last year analysed in the most recent report of the Observatory.
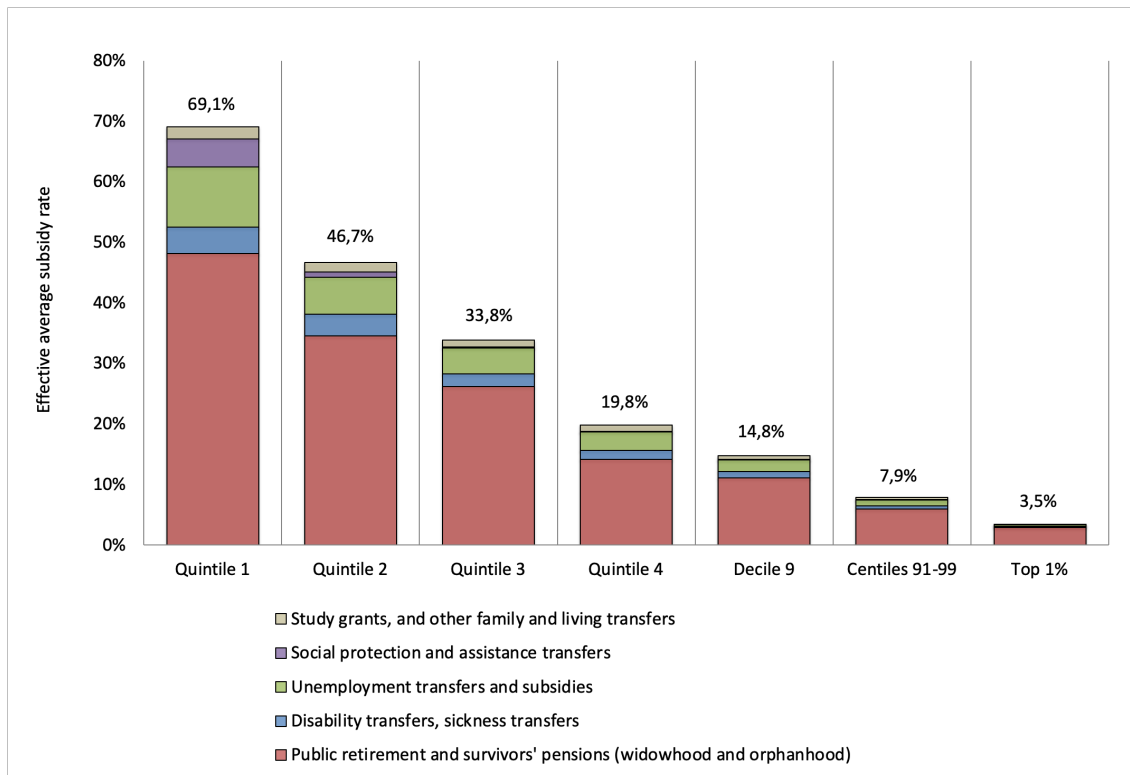
Figure 1 shows how the effective average subsidy rate for each type of cash benefit, defined as the ratio of the amount of the benefit received to gross income, varies with gross household income. In 2021, the effective average subsidy rate represented 21.6% of the gross income of all households, of which almost three quarters corresponded to retirement and survivors' pensions. The figure shows that the effective average subsidy rate decreases with income for all programmes, which is indicative of its progressive nature. To estimate the redistributive effect of these benefits, we have calculated the Reynolds-Smolensky index, obtaining that, overall, cash benefits reduce market income inequality by 24.9% in 2021. If we calculate the redistributive effect of the different benefits separately, we find that, as in all the years included in the Observatory, in 2021, the most redistributive category is retirement pensions, which reduce market income inequality by 16%, followed by survivors' pensions (4.3%), unemployment transfers (2.9%), disability (1.8%) and social assistance (0.7%).[9]

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[7] The categories of healthcare expenditure considered are as follows: Hospital and specialized services; Primary healthcare services; Public health services; Collective health services; Pharmacy expenses; Patient transportation, prosthetics, and therapeutic devices expenses. Additionally, capital investment expenditure related to the healthcare sector is included.

[8] The categories of education expenditure considered for individualised imputation are as follows: Early childhood and primary education; Secondary education and vocational training (excluding the higher cycle); Higher education: university and higher vocational training; Special and compensatory education; Education under special conditions (language schools, music conservatories, etc.); Adult education; Occupational education; Education abroad; Supplementary services; Extracurricular and related activities; Administration, teacher training, research, and others. Additionally, non-cash scholarships are included.

[9] Since the calculation of the redistributive effect of each cash-benefit is always in relation to the market income of households, the aggregate redistributive effect of all of them is not merely the sum of the

Figure 1. Effective average subsidy rates of cash benefits in 2021, by household gross income brackets (%)

Now, if we turn our attention to the tax side, Figure 2 shows how the effective average tax rates of each tax, calculated as the ratio of taxes paid to gross household income, vary with gross income. For all taxes, the effective average rate in 2021 is 34.9%. For all indirect taxes, effective average rates are decreasing with income. However, all direct taxes present some peculiarities. Only corporate income tax shows a profile of effective average rates that generally increase with gross income, with a large rise in the effective average tax rate in the last income centile. The effective tax rate curve for the wealth tax is very irregular. In the case of social security contributions, the existence of minimum and maximum contribution bases and the weight of corporate income among households belonging to the highest income percentile explain the inverted U-shaped pattern of effective average rates across the distribution of households' gross income. This last factor, together with the lower taxation of financial capital income and the majority of capital gains in the dual Personal Income Tax,[10]

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redistributive effects of each one, calculated separately. It also depends on their respective average effective subsidy rates and the re-ranking produced. This caveat also applies to taxes and in-kind benefits. On the possibility of aggregating redistributive effects, see Lambert (2001: chap. 11).

[10] Capital income and capital gains are taxed at rates ranging from 19% to 26%. The rates applicable to income from other sources range from approximately 19% to 49%: it should be noted that Spanish IRPF

also explains the significant drop in the effective average personal income tax rate for these same households. Adding all these pieces together, Figure 2 shows how the effective average rates of the tax system as a whole increase across most of the income scale, but significantly drops for households in the top 1% of gross income, a result similar to that found in other countries (see Figure 1 in Piketty et al., 2023).

The Spanish tax system reduced inequality of gross income (i.e., market income plus cash benefits) by 1.8% in 2021. The data continue to reflect the leading role of personal income tax in mitigating inequality: IRPF reduces gross income inequality by 4.3% in 2021, compared to the 0.9% reduction due to corporate income tax. It should be noted that, in recent years, a decline in the correction of inequality achieved by IRPF has been observed in our Observatory.

All other taxes have an unequalising effect: VAT and ITPAJD raise inequality by 2.7%, social security contributions by 0.6%, excise duties by 0.4% and wealth tax by 0.02%.

Figure 2. Effective average tax rates and composition in 2021, by household gross income brackets (%)
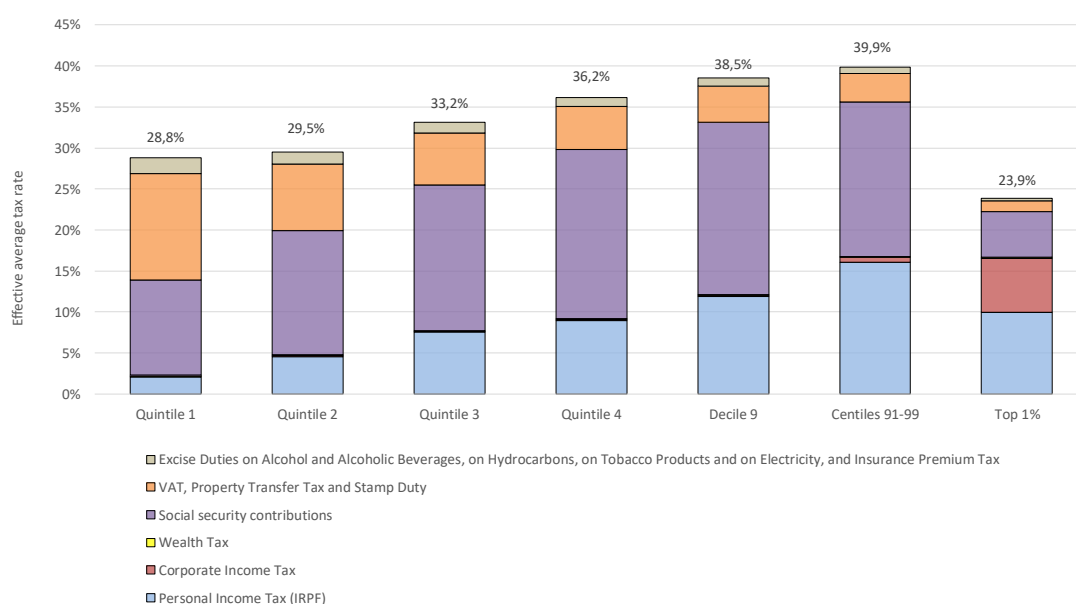

Figure 3 incorporates the last element analysed in the Observatory: in-kind benefits in health and education. In 2021, the effective average in kind subsidy amounted to 9.4% of gross income in health and 5.5% in education. As can be seen, it is clear that both health and

is a tax shared by the State and the Autonomous Communities, in which the latter are granted the legal power to establish their own tax schedule applied to these incomes.

education spending are progressive, with their respective effective average subsidy rates decreasing as gross household income rises. The progressive nature of health and education in-kind benefits is reflected in redistribution indices. In percentage terms, public health reduces inequality in disposable income by 9.6% in 2021, and education by 2.9%. Of the latter effect, 93.8% is due to non-tertiary education, so that spending on university and higher-level vocational training has practically no effect on the distribution of disposable income.

Figure 3. Effective average subsidy rates of public expenditure on health and education in 2021, by household gross income brackets (%)
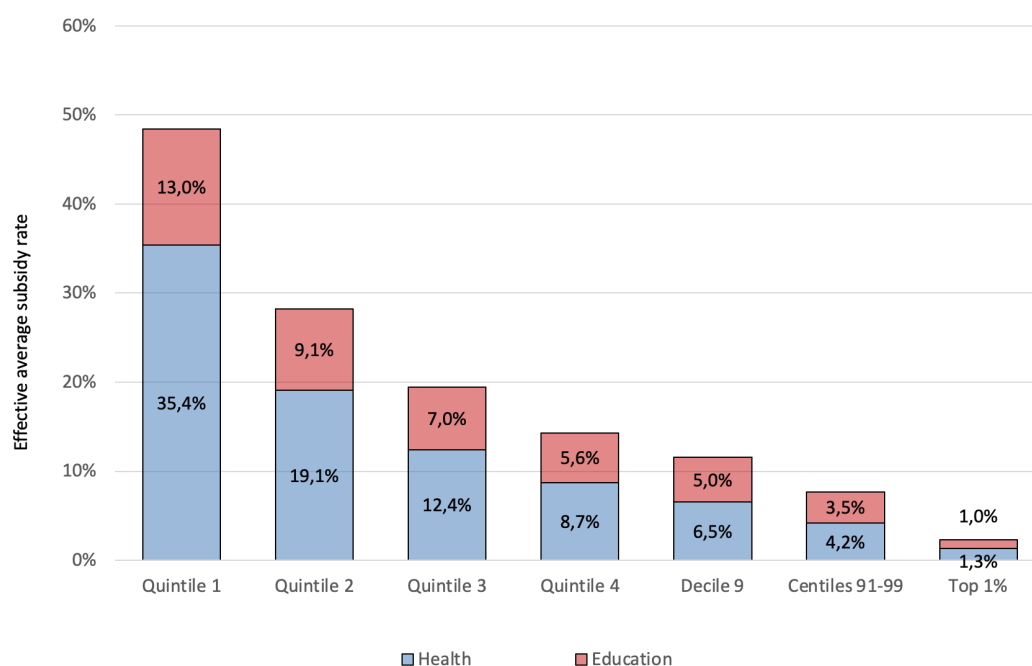

Figure 4 integrates the separate analyses performed so far and presents the aggregate impact of all taxes and benefits. Households belonging to the first three income quintiles (i.e., the 60% of resident households with lower gross income) are net beneficiaries of public intervention in 2021, since they receive, on average, a net effective benefit, i.e., a positive difference between benefits and taxes. The net balance in favour of these households is decreasing with gross income: from 89.3% of gross income for the first quintile to 20.1% for the third. Households located in the top two quintiles (i.e., the 40% with higher gross income), are net contributors, since, for them, on average, the difference between benefits and taxes, also expressed as difference between effective average rates, is negative: from -2.1% for the fourth quintile to -24.3% for centiles 91 to 99 and -18.1% for the 1% with the highest gross income.

The Annex presents the same information as in Figure 4, grouping households according to their composition, their main source of income and the age of the main income earner.

Figure 4. Combined imputation of taxes and benefits to Spanish households, in 2021 (effective average tax and subsidy rates as a percentage of gross income)
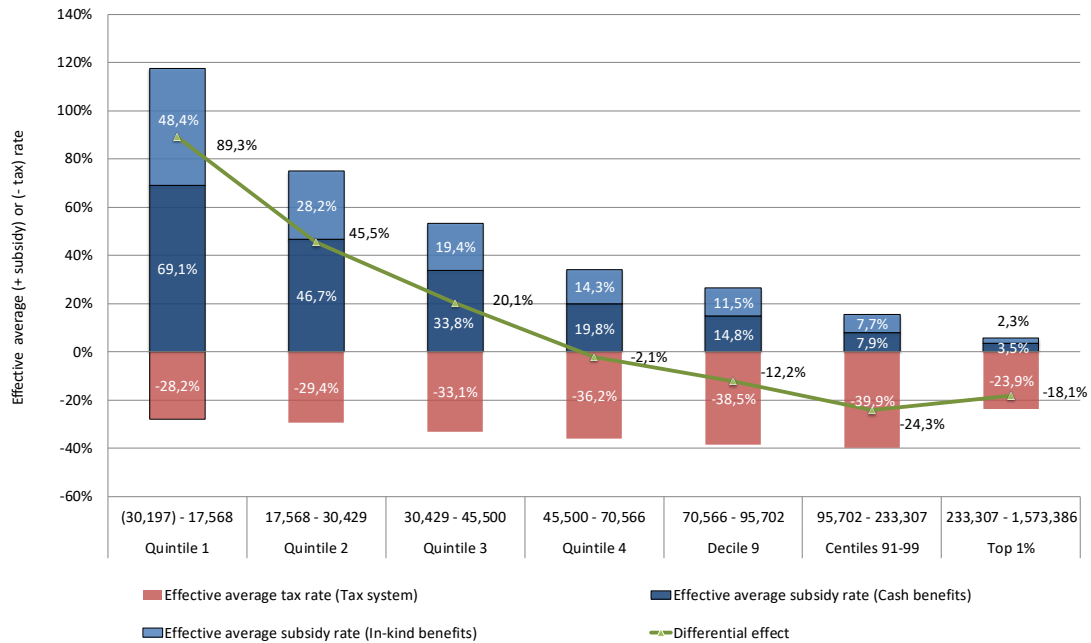
An alternative approach to illustrate the same results is provided in Figure 5. It shows the percentage share in total primary income of households in each gross income bracket, as well as their share in total extended disposable income, i.e., once households have paid their taxes and received the various cash and in-kind benefits covered in the Observatory. Consistent with Figure 4, households belonging to the first three quintiles have a higher share of extended disposable income than their share of primary income. Specifically, households in the first quintile increase their share of total income by 281% in 2021. The opposite holds for households belonging to the top 40%. In particular, households in the top 1% reduce their share of total income by 20% in 2021.

Figure 5. Share in total income in 2021, before and after benefits and taxes, of households in each gross income bracket (%)
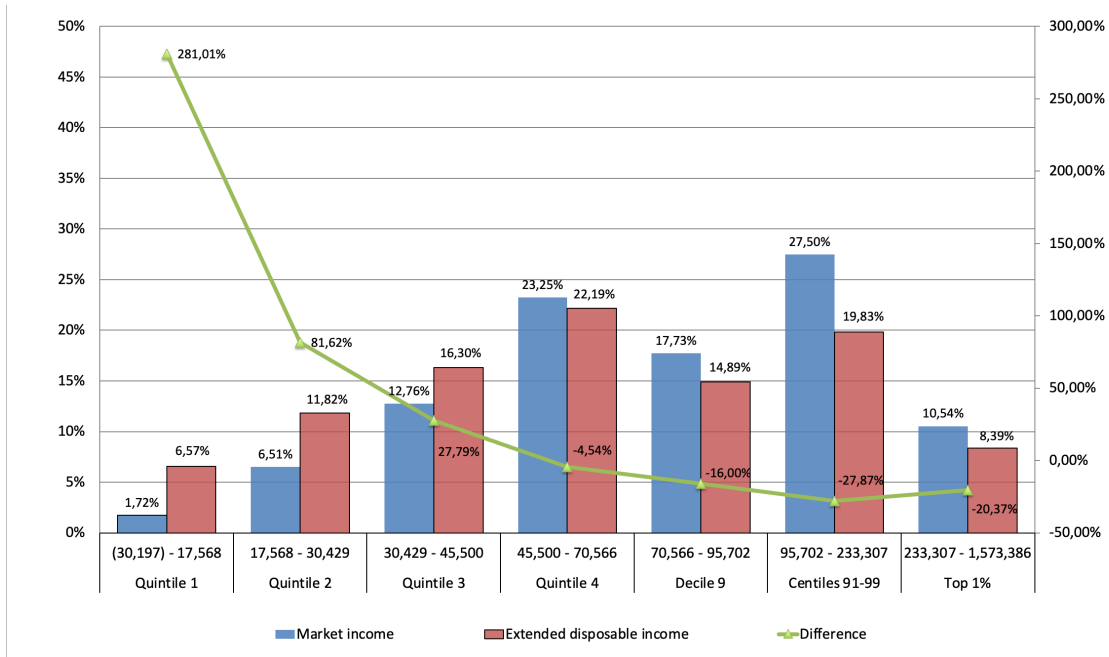
We finally calculate the aggregate redistributive effect of taxes and benefits in 2021 and compare it with the results provided by the Observatory for the period 2017-2021.[11] All the information is summarised in Figure 6, which depicts that public intervention in the form of taxes and benefits, both cash and in-kind, has reduced inequality in the distribution of market incomes across resident households by almost 35% in 2021. Cash benefits are responsible for 72% of this reduction, taxes for 4%, and in-kind benefits for the remaining 24%. The Figure clearly reflects the exceptionality of the year 2020, which experiences a notable increase in the inequality of household market income with respect to previous years, but also a very significant increase in the redistributive effect of taxes and benefits, reinforced by the measures adopted due to the onset of the COVID-19 pandemic; and also shows how the year 2021 seems to start the path back to the numbers of the pre-pandemic years.

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[11] The results gathered in the eighth report of the Observatory show a very similar pattern when the corrections of inequality achieved by the three blocks of public intervention are analysed in terms of equivalent income.

Figure 6. Evolution of inequality of market income, gross income, disposable income and extended disposable income (Gini indices) and percentage reduction in inequality by benefits and taxes, 2017-2021
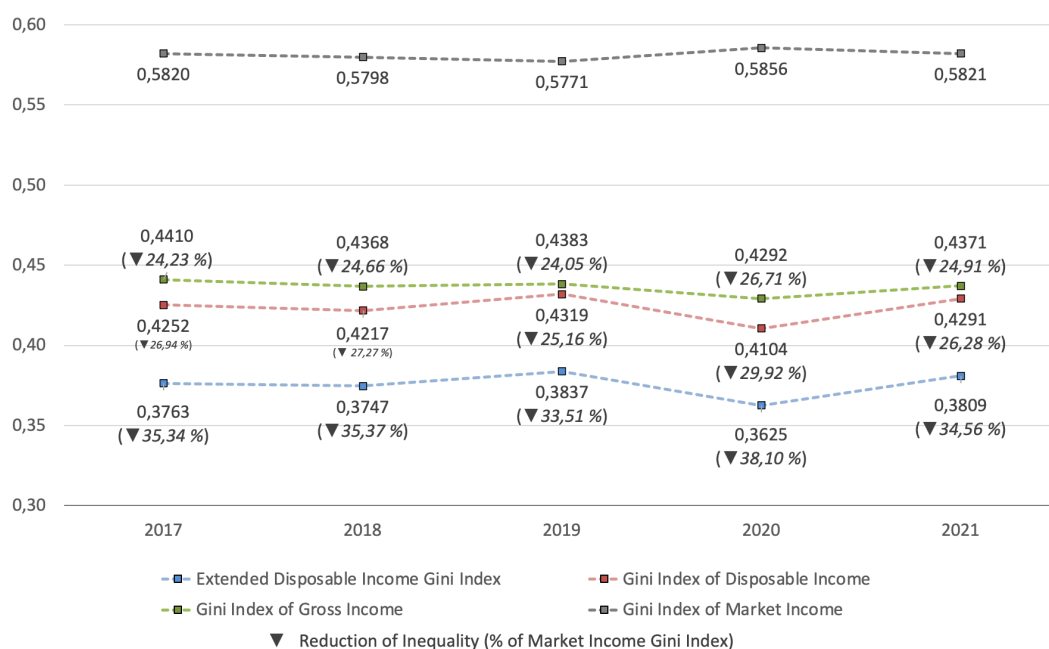
To interpret these results, it should be borne in mind that, while taxes account for approximately 85% of the non-financial revenues of Spanish public administrations as a whole, benefits represent around two thirds of total non-financial spending, the remaining third corresponding to public goods (general public services, defence, environment, etc.) and economic affairs (subsidies and grants to enterprises and institutions, investments in infrastructure, etc.). If, in a first approximation, spending on public goods were imputed equally on a per capita basis and spending on economic affairs in proportion to income, the result would be an increase in the redistributive effect achieved by cash and in-kind public benefits (Ebert and Lambert, 1999).

4. Concluding remarks

In this paper, we have presented the basic features of the "Observatory on the distribution of taxes and benefits among Spanish households": the taxes and benefits considered, the databases and methodology used and the main results obtained for 2021. The Observatory is an attempt to obtain as complete a picture as possible of the redistributive effect of Spanish public sector intervention through the tax-benefit system.

Future avenues for improvement include, on the one hand, the introduction of some refinements to the methodology for the imputation of taxes and benefits, as well as the incorporation of revenues and expenditures not currently covered by the Observatory. On the other hand, our research, like most others, presents a one-period analysis focused in what has happened in a given year. Although relevant and informative, this is a partial approach that should be complemented by adopting a life-cycle perspective, which considers the income earned, taxes paid and benefits received by households over the course of their lives. For the time being, the available databases for Spain make it difficult to measure the redistributive effects of public intervention from this life-cycle perspective.

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ANNEX. Taxes and benefits by type of household

In this Annex we show the incidence of the Spanish tax-benefit system for different categories of households, in the year 2021.

We will begin by dividing households according to their composition, considering the number of household members and how many are adults or minors. We build the following categories, following the criteria outlined by the ECV: 1. Household formed by a person aged 65 or over; 2. Household formed by a person aged 30 to 64; 3. Household formed by a person under 30; 4. Household formed by a couple without dependent descendants and in which at least one of the members is 65 or over; 5. Household formed by a couple without dependent descendants and in which both members are under 65; 6. Household formed by a couple with one dependent descendant; 7. Household formed by a couple with two dependent descendants; 8. Household formed by a couple with three or more dependent descendants; 9. Household formed by a single adult with at least one dependent descendant; and 10. Other households.

Figure A.1. Effective average tax and subsidy rates in 2021, according to household composition (%)
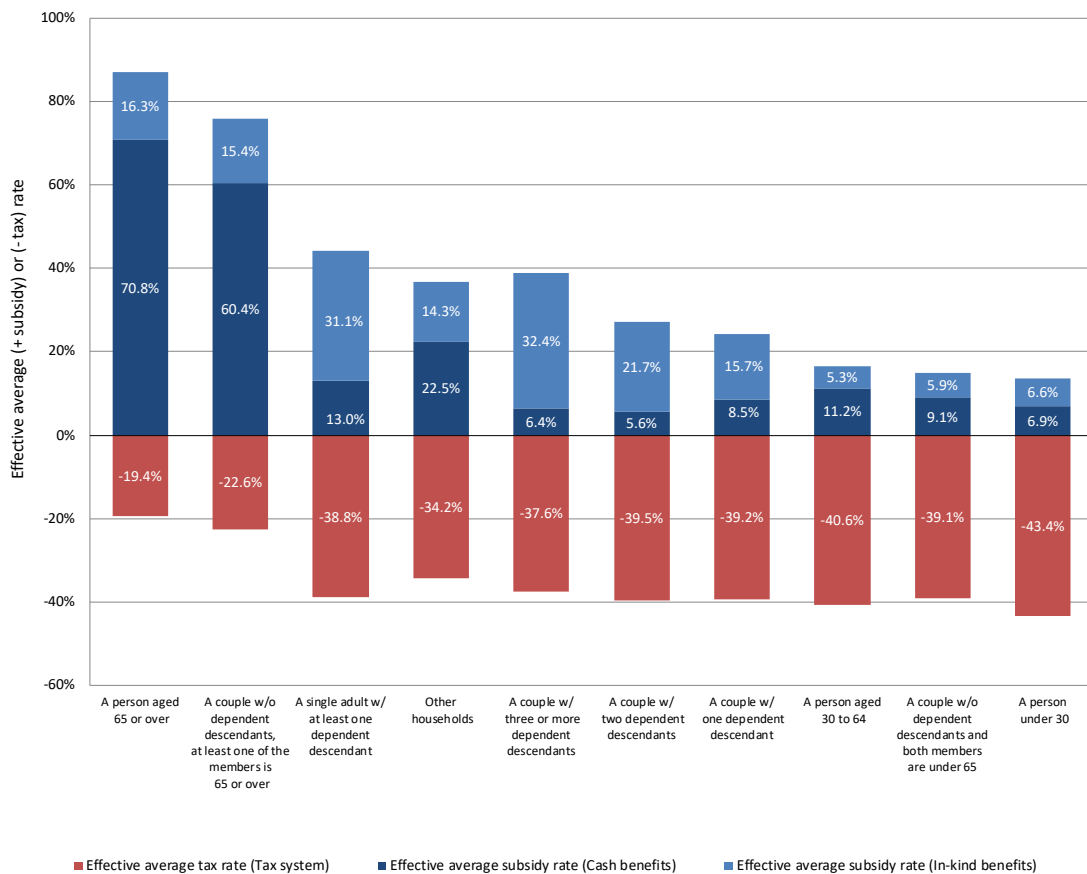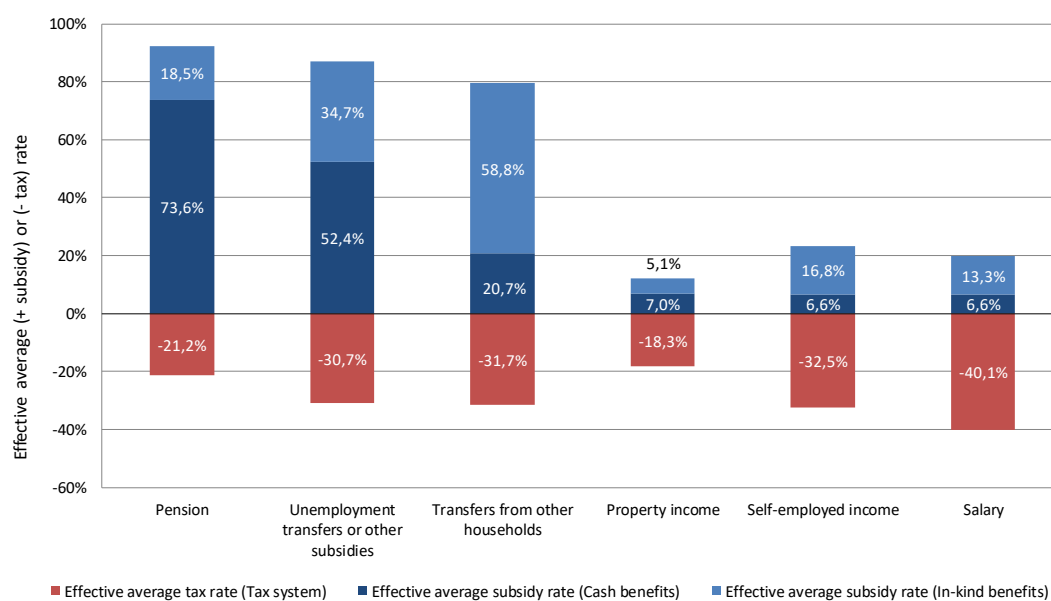
Figure A.1 shows the effective average tax and subsidy rates corresponding to each household group, according to the composition of the household. In this and the following figures, households are presented in order from highest to lowest balance of public intervention, calculated as the difference between the effective average subsidy rate and the effective average tax rate, i.e., between benefits received and taxes paid.

Next, we group households according to their main income source. The categories considered are as follows, also in accordance with the criteria outlined in the ECV: Salary; Self-employed income; Pension; Property income; Unemployment transfers or other subsidies; and transfers from other households. The effective average tax and subsidy rates for each category are shown in Figure A.2.

Figure A.2. Effective average tax and subsidy rates in 2021, according to the main source of household income (%)

Finally, we show in Figure A.3. the results of public intervention on households by age brackets of the main income earner in the household.

Figure A.3. Effective average tax and subsidy rates in 2021, according to the age of the main income earner in the household (%)