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Chapter 11

Basic Income or Vital Minimum? A Note on the Distributive Effects of Possible Reforms of the Spanish Income Tax*

Xisco Oliver Rullán and Amedeo Spadaro

Universitat de les Illes Balears Palma de Mallorca, Spain and PSE -Paris-Jourdan Sciences Economiques, Paris

Abstract

During the last 20 years, the Spanish redistribution system has undergone wide-scale changes. Since 1979, the year of the creation of income tax in Spain, there have been several reforms. The political and academic debate on their effects on equity and efficiency is still open. In this chapter, we contribute to this debate by using a microsimulation model that allows us to analyze the redistribution effect of different tax policy scenarios. Taking as a basis for the comparisons the 1999 system, we first analyze the redistributive performance of two scenarios based on a flat tax: one with a basic income and another one with a vital minimum. Finally we concentrate our attention on some possible reforms contained in the Socialist Party proposal (PSOE 2002). As expected, the results of our work suggest that a basic income-flat tax system has a strong redistributive impact, when compared with a vital minimum-flat tax mechanism. One interesting finding is that the cost, in terms of fiscal pressure, of such a reform is not too high when compared with the current fiscal system. The flat tax depends strictly on the amount of basic income given to each citizen, but with a flat tax around 25-30 per cent, it is possible to achieve a strong redistributive impact.

1. Introduction

During the last 20 years, the Spanish redistribution system has undergone wide-scale changes. Since 1979, the year of the creation of income tax in Spain, there have been several reforms. In 1996, after 14 years in government, the Socialist Party lost the elections and the new government (headed by the Popular Party) decided to reform the redistribution system, primarily by changing the personal income tax (PIT) system. The new tax law was introduced in 1999 and political and academic debate on its effects on equity and efficiency is still open.

In 2002 (PSOE 2002) the Socialist Party proposed an alternative tax reform, consisting of the replacement of the current personal income tax (PIT) system with a vital minimum – flat tax scheme. After the general elections of 2004, the new government (headed by Zapatero) started an internal debate about possible reforms of the personal income tax (PIT) to reduce complexity and to improve the redistributive performance by minimizing the costs in term of taxes collected.

In this paper, we contribute to this debate by using a microsimulation model that allows us to analyze the redistributive effects of different tax policy scenarios. Taking as a basis for the comparisons the 1999 system (defined by the *Ley 40/1998*), we first analyze the redistributive performance of two scenarios based on a flat tax: one with a basic income (BIFT), and another one with a vital minimum (VMFT). We then focus our analysis on some possible reforms contained in the Socialist Party proposal (PSOE 2002).

Of course, all these results must be considered with care, due to the simplifying assumptions made. The most important is the lack of behavioral reactions. The reforms analyzed in this paper are structural and they could have a strong impact on labor supply and consumption. This work must be interpreted as a further attempt to shed light on issues that are key elements in the political and economic debate.

As mentioned before, since 1998 - the year in which the Popular Party´s government proposed the reform - various authors have analysed the effects of the change. Most of these analyses have been based on microsimulation techniques. Castañer *et al.* (2001) use the panel data of the Spanish Institute of Fiscal Studies to look at the implications of the reform in terms of redistribution and welfare, showing that the 1999 scheme reduces total redistribution, mainly as a result of the reduction of tax receipts. Moreno *et al.* (1999) use Tax Office statistics and completed tax returns to measure progressivity, with similar results. Levi and Mercader (2001) focus on the analysis of the withholding mechanism and the effects on efficiency of the new income tax system, showing that the 1999 reform fails to reduce the compliance costs of taxpayers. Using another database, the *Encuesta de Presupuestos Familiares*, Sanchis and Sanchis (2000) simulate the new PIT system, taking into account the effects on household consumption of a VAT increase introduced to compensate for the fall in income tax revenue that the reforms involved. Their results show that mean taxable income decreased in real terms between 1998 and 1999 (by 16 per cent) and that the overall simulated new system increased disposable income inequality.

Another strand of literature about the Spanish fiscal system put the accent on BIFT, reflecting the propositions of such authors as Atkinson (1995) and Hall and Rabuska (1995). Gonzalez-Páramo (1986) and Fuentes Quintana (1987) present the first serious discussion of a possible implementation of a BIFT system in Spain. Another interesting paper analysing the implications of implementing alternative BIFT schemes on households of the Spanish Household Budget Survey 1990-91 is by Durán-Cabré (2001). Their findings show that BIFT systems have a big impact in the reduction of the income inequality. The problem with the simulations carried out in the Duran-Cabré work is that the proportional tax rates proposed to maintain the neutrality of revenue and to reduce significantly the inequality of pre-tax income are around 60 per cent, and so are too high to be politically feasible.

More recently, Castañer and Sanz (2002) have focused on the analysis of redistribution and welfare implications of a VMFT reform. In this work they simulate the redistributive effects of replacing the 2001 Spanish income tax by a VMFT scheme on a sample of taxpayers coming from the 1995 wave of the Panel of Tax Returns of the IEF. First, they look at the mix of vital minimum and flat tax rates maintaining the same aggregate fiscal pressure as the 2001 system showing that there is a non-linear (exponential) relationship between the level of tax and the value of the vital minimum. Second, they analyze the winner-loser effects of a particular combination of vital minimum and flat tax that gives the same redistributive impact as the 2001 system — showing that, with the equivalence scale they use, households with more taxpayer units are the winners from the reform. Prieto *et al.* (2002) also analyze a VMFT reform, additionally focusing on the polarization effects. They show that a VM-FT scheme reduces both inequality and polarization.

This chapter is organized as follows. In the following section we describe the microsimulation model and the database used. In the third section, we describe the 1999 structure of the Spanish tax-benefit system. The fourth section is devoted to the BIFT and the VMFT simulations. In section five, we present the results of the simulations carried out following the proposition contained in the PSOE report (2002). Finally, in the last section, the main conclusions are summarized.

2. The Data and the Microsimulation Model

Following the Bourguignon *et al.* (1998) experience with the Eur3 model, we have built a microsimulation model called GLADHISPANIA to simulate changes in the Spanish Tax-Benefit system, starting from microdata. The model uses a dataset containing economic and socio-demographic information on households and simulates the impact that different tax-benefit policy scenarios have on the income distribution of the population.

The database used is the Spanish part of the 1995 European Community Household Panel (ECHP), published by EUROSTAT, which includes socio-demographic characteristics, income characteristics, and labor status. Our dataset contains information at both the individual and household levels. After filtering the sample for records without information on the head of the household, we obtained a sub-sample of 6,420 households out of 6,522. The original dataset was then updated, using a correction factor including inflation and growth rates from 1995 to 1999. Since we have disposable income sources in our database, we have used our microsimulation model to compute gross values[1]. No changes in the socio-demographic structure have been taken into account.

Obviously, many simplifying assumptions have been made due to data deficiencies in order for us to build the model. For this reason, a validation and calibration exercise has been carried out to check the behavior of the microsimulation model (for further details see Oliver and Spadaro, 2002).

3. The 1999 Spanish Tax-Benefit System

In this section, we describe the main aspects of the 1999 Spanish tax-benefit system.

3.1 Social contributions

Social security contributions can be divided into the social security contributions paid by the employee and those paid by the employer. Social security contributions depend on several factors: a person's gross earned income, type of employment contract (temporary or permanent), employment hours (part-time or full time), work status (graduate workers, engineers, unqualified assistants, white-collar workers, etc.), employment sector, occupational-status (self-employed, dependent worker, civil servant, etc.) and his/her previous status before being employed in his/her current job. There are various categories of "social affiliation status", each with its own system of regulation[2].

Two elements must be considered if we wish to compute social security contributions. There is a base-rate for contributions, closely related to the worker's earned income, between an upper and a lower limit, and there is also a contribution rate that is split into two: the employer's contribution rate and the employee's contribution rate. Table 1 details the contribution rates of the general social affiliation status system. Meanwhile, in Table 2, the maximum and minimum contribution base-rates are shown under the 1999 Spanish system of regulation. In Table 1, we can see that the social security contributions paid by the employer amount to about 35 per cent of the total, whilst the social security contributions paid by the employee only represent 6.4 per cent. This is not usual in other European countries, where the social security contributions paid by the employer are quite low. Although the employer's social security rates are high and are clearly specified, many contracts involve reductions in rates, depending on the employee's conditions, prior to starting or his or her current conditions. For example, there are rate reductions if the worker was previously unemployed, if the worker is over 45 years of age, or if the worker is disabled. Previous conditions are impossible to model, due to the lack of information available.

3.2 Personal income tax (PIT)

The Spanish PIT system is a yearly income tax system. During the year, income tax is paid – and withheld at the source – when people receive wages, capital income or other income sources. At the end of the tax year, however, they must fill in an income tax return and compute whether they have to pay additional sums of money or whether they are entitled to get money back from the Treasury Department. A very small number of people, those with the lowest incomes, are not required to fill one in, although they can do so if it is in their interest.

Table 1: Social Security Contribution Rates

	Firm	Worker	Total
Item contribution	1999	1999	1999
Common contingencies	23.60%	4.70%	28.30 %
Mean of industrial accidents and professional illnesses	4.00%	0.00%	4.00%
Unemployment			
Full time worker (permanent worker)	6.20%	1.60%	7.80%
Full time worker (temporal worker)	6.70%	1.60%	8.30%
Part time worker	7.70%	1.60%	9.30%
Social guaranty fund	0.40%	0.00%	0.40%
Professional training	0.60%	0.10%	0.70%

Table 2: Monthly Minimum and Maximum Bases, 1999

Minimum base	80815 (= minimum wage/12)
Maximum base	399780

Table 3: Tax Rates Scheme, 1999

Individual and joint income tax return

Bracket	Marginal tax rate
0-600000	0.18
600000-2100000	0.24
2100000-4100000	0.283
4100000-6600000	0.372
6600000-11000000	0.45
> 11000000	0.48

The Spanish PIT system has undergone a dramatic change with the major reforms of 1999[3]. The system moved from a structure in which people's specific conditions were taken into account mainly by means of tax deductions to one where they are taken into account by means of tax allowances. Let us take the case of a dependent child as an example. Before the 1999 reforms took place, there was a tax reduction of 25,000 ptas. for the first child, 35,000 ptas. for the second one and 50,000 for the third and any subsequent children. Under the 1999 system, there is a deduction of 200,000 ptas. for each of the first two children and 300,000 ptas. for the third child and any of the following ones, but this amount reduces taxable income rather than tax itself.

The 1999 reforms followed the German philosophy of a *subsistence-level minimum income*: the income that is taxable must only represent the surplus income, once basic needs have been covered. These reforms also conform to the government's announcement that it would lower the tax rate schedule and reduce the number of tax brackets from 8 to 6, as can be seen in Table 3. We can see that there is only one schedule for single persons and family income tax returns. We can also observe that the maximum and minimum marginal taxes have fallen. The maximum amount of tax has gone down from 56 per cent to 48 per cent, whilst minimum marginal tax rates have been reduced from 20 per cent to 18 per cent.

Table 4: Main Characteristics of the Spanish PIT in 1999

Gross wages (includes: wages, retirement pension, unemployment benefits…)
+ Self-employment income
+ Property income
Owner occupied dwelling is not an income source
+ Capital income
Paid dividends must be increasing in 40%, but there exist a tax credit in the same amount. This has been made to avoid double taxation of firm profits
= Taxable income before vital minimum
- Tax allowances
Personal minimum: 550,000 ptas. (+100,000 for people older than 65)
Family minimum
Ascendants: 100,000 each one if their rents are lower than the minimum wage
Dependent children: 200,000 each of the first two and 300,000 for the rest. These amounts are increased in 50,000 ptas. per child under 3 and 25,000 per child between 3 and 16 (dependent children are children under 25 and with rents under 1 million)

= Taxable income before tax allowances

- Tax allowances
Pension plan: with a maximum of 1,100,000 ptas. or 20% of earned income

= Taxable income

⇒ Tax before tax credits

- Tax credits (see table 5)

= PIT

Notes: Tax credits in 1999 are Cultural items Investment: 15%; Donations: 10-25%; Paid dividends: 40% in the general case; and house investment. For house investment, there is a tax credit of 15% for the amount invested in special housing bank accounts with a limit of 1,500,000 ptas. per year, during a maximum of 4 years; Mortgage payments = Mortgage interests + Mortgage repayments; Mortgage payments without loans yields a tax credit of 15% and with loans there are two categories: 1. First two years: 25% for the first 750,000 ptas. and 15% until 1,500,000 ptas. ; and 2. Third year and following: 20% for the first 750,000 ptas. and 15% until 1,500,000 ptas.

The main characteristics of the 1999 PIT system are described in Table 4. The income that is subject to PIT includes: earned income (gross wages and income of self-employed), income from property, capital income, and changes in wealth. These last two are all classified as capital income in our model, due to the lack of information and the complexity of the taxation of these sources of income.

The five per cent deduction on gross earned income, with an upper limit of 250,000 ptas., is eliminated by the reform. Instead, new deductions on earned income are introduced, depending on the level of earned income in question. Earned income can be reduced by between 375,000 and 500,000 ptas., depending on the amount earned (i.e. by 500,000 ptas. if a person's earned

income is lower than 1,350,000 ptas. and 375,000 if it is greater than 2,000,000 ptas.). The deduction on gross income for mortgage interest payments on the purchase of a house (the earner's main residence) is also eliminated and, instead, a new tax credit is introduced. As for capital income, the reform eliminates the supposed income from owner-occupied dwellings (2 per cent of the registered council value of the property). In addition, the tax deduction on returns on capital income (the "minimum income exemption" of 29,000 ptas.) is also eliminated.

Before the reforms, there was no minimum personal exemption or minimum family exemption, but there were personal and family tax deductions. Under the 1999 system, once taxable income has been calculated (before the subsistence-level minimum income), we have to apply the personal and family minima, which then give us the taxable income before allowances. The minimum personal exemption is 550,000 ptas., or 1,100,000 ptas. in the case of a couple who fill in a joint family income tax return. This personal minimum exemption amounts to 650,000 ptas. when the earner is over the age of 65 and 850,000 or 1,000,000 ptas. in the case of a disabled person. The minimum family exemption involves two tax deductions. The first is a deduction of 100,000 ptas. for each dependent relative over 65 years of age with an income below the minimum wage. The second is a deduction per dependent child: 200,000 for each of the first two and 300,000 ptas. per child after the second child. In both cases, these quantities are increased by 25,000 ptas. per child for children aged between 3 and 16 and by 50,000 if the children are under 3 years of age.

Tax allowances change relatively little with the reforms. Mortgage interest is grouped together with mortgage repayments and become a tax credit under the new tax system. Pension plans remain unchanged, except for a modification of the upper limit for deductions, which changes for people over 53 years of age – the maximum deduction rises from 1,100,000 to 2,200,000 ptas. When tax allowances are subtracted, we get the taxable income and we are ready to compute the tax before tax deductions. Then, tax deductions must be taken into account (see footnotes to Table 4). In 1998, there were a lot of tax deductions but, in 1999, some of them were included in the subsistence-level minimum income (i.e. personal and family tax deductions). Others became tax deductions on different kinds of expenditure (i.e. tax deductions on employees wages) and some of them were eliminated (i.e. expenditure due to illness and house rentals). With the new PIT system, earnings allowances and increases in personal or family minima replace deductions for personal disabilities.

After the application of tax deductions, we obtain the amount of tax that must be paid (the "*cuota íntegra*") but, as mentioned before, tax is withheld at source every month. So, at the end of the tax year, people must calculate whether they have to pay additionally (a "*cuota líquida*") or whether they are entitled to get money back. In the microsimulation model, we do not take into account monthly withholdings. Instead, we make a direct calculation of the net tax due at the end of the year.

4. Vital Minimum-Flat Tax vs Basic Income-Flat Tax

In order to explore the implications on welfare and redistribution of the introduction of a flat tax, we have run, in a first stage, two kinds of simulations: the basic income-flat tax reform (BIFT) and the vital minimum-flat tax reform (VMFT). The VMFT reform replaces the 1999 PIT with a vital minimum, which consists in a tax allowance per equivalent adult[4]; and a proportional tax on the rest of the income.

The BIFT reform consists in a universal lump-sum transfer, called the "basic income" (i.e. an amount of money that the government allocates to each household, independent of income and status) plus a flat tax on any remaining income. As in the VMFT option, we take into account the number of members of the household, giving a basic income per equivalent adult. The advantages or disadvantages of a VMFT or BIFT scheme are well known in the literature[5]. They can be summarised as follows:

Advantages	**Disadvantages**
Eliminating all the current allowances and deductions would broaden the tax base. Then, all sources of income would be treated equally (horizontal equity).	These schemes can affect the labor supply of more productive people if the flat tax is too high.
Simplicity for taxpayers, and consequently, more transparency, since all income is taxed at the same rate	High rates can cause capital flows toward other countries with better capital fiscal treatment.
Simplicity for the Treasury Department, and then, minor collection costs and less tax evasion	Lower flat taxes can generate redistribution towards the rich people. In the Spanish case, the incentive to save disappears.[6]

We have run four simulations for different flat tax rates. To facilitate the analysis of the redistributive performance of the various alternatives, the basic income or vital minimum has been chosen in order to respect the government's budget constraint (with respect to our year of reference, 1999). In the following table, we show the four simulated scenarios. We start from the maximum marginal tax rate of the 1999 system (46 per cent); which allows 770,650 ptas. of annual basic income per equivalent adult (and 2,328,900 ptas. as vital minimum), and we reduce the flat tax rate to 38 per cent, 30 per cent and 25 per cent. Obviously, reducing the flat tax implies reducing the basic income or vital minimum simulated.

Table 5: BIFT & VMFT simulated scenarios

	BIFT	**VMFT**
Flat tax rate	Basic Income	Vital Minimum
46%	770,650 ptas. (column 4)	2,328,900 ptas. (column 5)
38%	586,750 ptas. (column 6)	1,996,900 ptas. (column 6)
30%	402,850 ptas. (column 8)	1,595,400 ptas. (column 7)
25%	287,900 ptas.(column 10)	1,287,400 ptas. (column 8)

Note: The column references refer the reader to the correct column of results in Table 6 below.

4.1 Overall Results

Table 6 shows the Generalized Lorenz curve results of the 1999 scenario, as well as the percentage variations for each of the simulations carried out. The table is useful to identify the winners and losers from each policy, relative to the reference scenario (1999) as well as the redistributive effects of each. The results are presented by deciles of 1999 gross income per equivalent adult. The second and third columns show the values of 1999 disposable and gross income respectively, while the others represent the percentage variation in the disposable income of each decile, with respect to the 1999 reference values. From the fourth column to the eleventh, we show all the BIFT and VMFT simulated reforms. All of the various scenarios result in the collection of the same total tax revenue – namely, the same as that actually collected in 1999.

Columns (4) and (5) show the simulations for a flat tax of 46 per cent, a basic income of 770,650 ptas. and a vital minimum of 2,328,900 ptas. respectively. With the BIFT the first 6 deciles win, while with the VMFT the first 8 deciles win. But there are big differences in gains. For example, in the first decile, with BIFT there is a disposable income increase of 122 per cent (disposable mean income moves from 443,130 ptas. to 984,561 ptas.), while there is an insignificant gain of income with the VMFT scenario. These simulations clearly reveal that BIFT reform is more redistributive than VMFT; and both are more redistributive than the 1999 scenario.

If the tax rate is 38 per cent, 30 per cent or 25 per cent we get similar conclusions (columns (6)-(11)). The smaller the flat tax, the smaller is the increase in income of poorer people and the smaller is the decrease in the disposable income of richer deciles. An interesting result is that, under the BIFT scheme and for the simulation with a relative small tax rate (i.e. the 25 per cent scenario), we observe an increase in the disposable income of the richest deciles. This happens because a small flat tax will reduce the tax burden of rich households with respect to the 1999 scheme. Under the VMFT scheme, the first deciles always observe no significant gains. The middle class deciles are the winners of the reform while the richest deciles lose. As in the BIFT case, when the flat tax is small (30 per cent or 25 per cent), the last

decile wins with the reform. Moreover, if tax rate is 25 per cent, the VMFT scheme is less redistributive than the 1999 scenario.

Table 6: Differences in Disposable Income by Decile From the BIFT and VMFT Reform Scenarios

	1999		**46%**		**38%**		**30%**		**25%**	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Decile	**Disposable income**	**Gross income**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**
1	443,130	483,126	122.18	0.02	89.84	0.02	57.41	0.02	37.19	0.02
2	849,291	881,266	42.56	0.17	29.36	0.17	16.14	0.17	7.87	0.17
3	1,020,399	1,069,590	28.11	0.64	18.43	0.64	8.74	0.64	2.71	0.57
4	1,219,141	1,308,247	15.99	2.15	9.50	2.15	3.00	2.13	-1.05	0.99
5	1,433,091	1,574,453	7.86	4.47	3.80	4.47	-0.29	3.59	-2.83	-0.46
6	1,678,794	1,906,255	1.06	7.38	-0.82	6.82	-2.70	1.82	-3.87	-1.84
7	1,965,069	2,294,961	-4.23	8.88	-4.31	4.41	-4.35	-0.50	-4.38	-2.65
8	2,367,400	2,849,655	-9.29	3.40	-7.40	-0.13	-5.54	-2.34	-4.39	-2.95
9	2,921,164	3,633,073	-13.33	-3.03	-9.69	-3.80	-6.07	-3.48	-3.80	-2.64
10	4,736,055	6,517,792	-14.75	-8.40	-7.63	-4.00	-0.55	1.05	3.93	4.65
Overall mean	1,863,702	2,252,176	0	0	0	0	0	0	0	0

Note: Generalized Lorenz curves differences relative to the reference scenario 1999 Disposable income is given per equivalent adult of the household. The percentages are differences relative to the reference scenario (1999 disposable income). BIFT and VMFT reforms collect the same tax revenue as in 1999.

Table 7 shows the most relevant inequality indexes: Gini index, Atkinson index and Entropy index for each scenario. We get a Gini index of 0.374 and 0.330 respectively[7] for 1999 gross and disposable income. If the tax rate is 46 per cent we get a lower Gini index (0.223 in BIFT scenario and 0.313 in VMFT scenario), which implies less inequality. Moreover, the Gini index in BIFT is lower than the Gini index in VMFT scenario for every tax rate. If the tax rate is small, 25 per cent, the Gini index is similar to the reference scenario (0.318 in BIFT scenario and 0.334 in VMFT scenario).

Atkinson and Entropy indexes, reported in Table 7, drive us to the same conclusions. If the flat tax is 46 per cent, inequality decreases relative to the 1999 scenario. As expected, with a lower flat tax the redistributive power of the BIFT and VMFT scheme is lower. Under BIFT-38 per cent and BIFT-30 per cent there is a big reduction in inequality (always with respect to 1999). Under VMFT-38 per cent there is some reduction of inequality, which disappears under VMFT-30 per cent, where the inequality is the same as in the 1999 scenario (some indexes increase and some decrease, but the differences are very small). As observed before, under VMFT-25 per cent there is a slight increase in inequality when compared with the 1999 scenario. [8]

Table 8: Effects of the Reforms on Inequality Indices

Measure	**1999**		**46%**		**38%**		**30%**		**25%**	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Gini	0.330	0.374	0.223	0.313	0.259	0.318	0.295	0.326	0.318	0.334
Atk e=0.5	0.102	0.129	0.046	0.093	0.061	0.097	0.078	0.102	0.091	0.107
Atk e=0.9	0.229	0.268	0.077	0.218	0.102	0.222	0.132	0.228	0.153	0.234
Atk e=1.5	0.296	0.349	0.117	0.285	0.155	0.289	0.201	0.294	0.236	0.300
Atk e=2	0.525	0.575	0.145	0.519	0.193	0.521	0.252	0.523	0.299	0.526
Entr c=0.1	0.285	0.341	0.089	0.270	0.119	0.276	0.156	0.284	0.183	0.293
Entr c=0.5	0.209	0.267	0.093	0.191	0.124	0.199	0.160	0.210	0.186	0.219
Entr c=0.9	0.202	0.267	0.100	0.181	0.132	0.191	0.169	0.205	0.195	0.217
Entr c=2	0.246	0.374	0.140	0.210	0.188	0.235	0.243	0.268	0.281	0.295

4.2 Taking Account of Household Size

In this sub-section we present the results of the analysis per household size, without using equivalent scales. In order to analyze the results on homogenous families, we have classified the households into five types: singles, couples[9], couples plus a dependent child[10], couples plus two dependent children, and couples with three or more dependent children. We have excluded all households who do not fit into this classification because including very heterogeneous types of households can distort the analysis.

The results obtained for singles are presented in Table 9. The comparison between the BIFT and the VMFT scenarios for any flat tax shows that the BIFT scheme increases the income of the poorest households, while the VMFT has no relevant effects with respect to the 1999 scenario. For example, with the BIFT-38 per cent, for the first decile the increase in net income is 174.5 per cent while for the second decile net income increases by 39.4 per cent. The gains are positive and decreasing progressively until the eighth decile. For the last two deciles, net income is lower than under the 1999 scheme.

On the other hand, with the VMFT-38 per cent there are no relevant changes in the deciles 1-6, a small increase in net income in deciles 7 and 9, and a net decrease of 4 per cent in the last decile — while the eighth decile is the great winner with increase of 7.8 per cent in their income. As shown in the previous cases, the BIFT-38 per cent is more redistributive than the VMFT-38 per cent. This conclusion can be extended to any flat tax simulated and, as we will see later, to any type of family.

When the flat tax is 46 per cent, the results are similar to those mentioned previously. Winner and loser deciles are the same, but with the BIFT-46 per cent increases and decreases in net income become bigger. If we compare the VMFT-46 per cent and the VMFT-38 per cent, differences do not appear until the eighth decile (in the seven first deciles we are under the vital minimum and for this reason we do not observe changes). Yet, the change observed for the

eighth decile is the most important with an increase of 9.8 per cent — while in the top decile, the reduction in income goes from 4.1 per cent to 7.2 per cent.

If the flat tax rate is smaller, 30 per cent or 25 per cent, we observe that the pattern of the changes remains equal, but the system is less redistributive. With a flat tax of 25 per cent we discover two facts. First, it is notable that in the top decile there are no losers. This is due to the fact that the marginal tax rate for higher incomes decreases with respect to the 1999 system. Second, there is a little difference between the 1999 system and the VMFT-25 per cent (the overall mean income just increases by 0.6 per cent with the VMFT).

Table 9: Differences in Disposable Income by Decile From the BIFT and VMFT Reform Scenarios for Single Persons

	1999		**46%**		**38%**		**30%**		**25%**	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Decile	**Disposable income**	**Gross income**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**
1	269172	300863	233.1	0.0	174.5	0.0	115.2	0.0	77.6	0.0
2	755353	771604	55.6	0.1	39.4	0.1	23.0	0.1	12.7	0.1
3	922220	926393	37.3	0.0	25.4	0.0	13.6	0.0	6.1	0.0
4	963082	964401	33.9	0.0	22.8	0.0	11.8	0.0	4.8	0.0
5	992923	997234	31.5	0.1	21.0	0.1	10.5	0.1	3.9	0.1
6	1112631	1123196	23.1	0.4	14.6	0.4	6.2	0.4	0.9	0.3
7	1314832	1373027	13.6	3.0	7.8	3.0	2.2	2.9	-1.3	1.1
8	1758263	2002043	1.6	9.8	0.2	7.8	-1.2	3.1	-2.0	-0.1
9	2479992	3062402	-8.7	3.4	-6.2	0.7	-3.7	-0.6	-2.1	-0.7
10	4096476	5452572	-14.5	-7.2	-8.3	-4.1	-2.1	-0.3	1.7	2.6
Overall mean	1469694	1701583	11.3	0.0	8.1	0.1	4.8	0.4	2.8	0.6

Note: Generalized Lorenz curves differences relative to the reference scenario. 1999 disposable income is given per equivalent adult of the household. The percentages are differences relative to the reference scenario (1999 disposable income). BIFT and VMFT reforms collect the same tax revenue as in 1999.

The results of the simulations for couples without children are presented in Table 10. As we found before, the VMFT has no effect on low income households. We find also that, with a flat tax of 25 per cent, the highest deciles increase their income under both the BIFT and the VMFT, due to a fall in marginal tax rates with respect to the 1999 scenario. Similar results are observed for ‘couple with one child’ households. As expected the BIFT scheme improves the situation of the poorest deciles, while there are no changes under the VMFT schemes. Other tests conducted by us showed that inequality indexes do not change too much.

Table 9: Differences in Disposable Income by Decile From the BIFT and VMFT Reform Scenarios for Couples With No or One Child

	1999		46%		38%		30%		25%	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Decile	**Disposable income**	**Gross income**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**
Couples Without Children										
1	788788	817042	89.0	0.0	64.9	0.0	40.5	0.0	25.4	0.0
2	1159970	1173705	47.4	0.0	33.0	0.0	18.6	0.0	9.7	0.0
3	1439602	1480095	28.9	0.2	19.0	0.2	9.1	0.2	3.0	0.2
4	1749165	1806140	15.7	1.4	9.3	1.4	2.8	1.3	-1.3	0.6
5	1978025	2052039	9.4	2.3	4.5	2.3	-0.3	2.0	-3.2	-0.9
6	2205613	2368584	4.6	4.6	1.4	4.5	-1.8	2.7	-3.8	-1.7
7	2574716	2878647	-1.1	8.1	-2.3	6.0	-3.4	0.7	-4.1	-2.3
8	3026521	3517235	-6.2	7.1	-5.5	2.5	-4.8	-1.3	-4.3	-2.8
9	3759331	4538190	-11.8	-0.6	-9.0	-2.6	-6.2	-3.4	-4.5	-3.2
10	6367603	8529217	-16.1	-9.5	-9.4	-5.7	-2.8	-1.2	1.3	2.0
Overall mean	2508715	2918466	2.1	-0.2	1.0	-0.3	0.0	-0.4	-0.6	-0.7
Couples With One Child										
1	811055	895331	111.1	0.0	81.5	0.0	51.2	0.0	32.4	0.0
2	1522312	1650575	37.6	0.0	25.4	0.0	13.2	0.0	5.5	0.2
3	1875458	2085779	21.9	2.0	13.7	2.0	5.7	2.0	0.7	1.6
4	2238250	2519532	12.5	4.2	7.1	4.2	1.9	4.2	-1.5	1.1
5	2641054	3085819	5.4	8.5	2.7	8.5	-0.2	4.7	-1.8	0.4
6	3139915	3665457	-2.0	9.2	-2.7	6.6	-3.4	0.7	-4.0	-2.1
7	3679078	4468354	-7.0	6.6	-6.2	1.8	-5.1	-1.5	-4.6	-3.0
8	4409611	5473628	-11.8	0.0	-9.2	-2.5	-6.3	-3.3	-4.6	-3.3
9	5305897	6630307	-14.7	-4.9	-10.7	-5.1	-6.5	-4.1	-4.0	-2.9
10	8222401	11319536	-15.5	-9.2	-8.4	-4.8	-1.1	0.5	3.4	4.1
Overall mean	3388817	4188919	-1.7	-0.3	-1.3	-0.4	-0.8	-0.3	-0.5	-0.2

Note: Generalized Lorenz curves differences relative to the reference scenario. 1999 disposable income is given per equivalent adult of the household. The percentages are differences relative to the reference scenario (1999 disposable income). BIFT and VMFT reforms collect the same tax revenue as in 1999.

When we compare couples with two children with couples with three children (see Table 10) there are two striking facts. First, in the first four deciles, mean income is greater for couples with two children under the 1999 system. Second, in the last decile, income of couples with three children is greater than mean income for couples with two children. This is certainly due to the economic and socio-demographic structure of the ‘couples with three children’ population: looking at the dataset we observe that there are many very rich families in the this group (gross income rises from 8,735,110 in ‘couples with two children’ to 13,424,778 in ‘couples with three children’).

An interesting general result observed by looking at the redistributive performance of the different schemes simulated on each type of household separately is that singles are better treated by the BIFT schemes than other types of households. The higher is the number of people in the household, the lower is the redistribution obtained by the BIFT. This is certainly due to the equivalence scale used to assign the basic income that gives, proportionally, more weight to households of smaller size. On the contrary, the VMFT scheme benefits large households. This is due to the lower average tax rate that richer households (which are the ones with more components) face under the VMFT scheme (with respect to the 1999 one). This second result is in line with the one obtained by Castañer and Sanz (2002).

Table 10: Differences in Disposable Income by Decile From the BIFT and VMFT Reform Scenarios for Couples with Two and Three Children

	1999		**46%**		**38%**		**30%**		**25%**	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Decile	**Disposable income**	**Gross income**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**	**BIFT %**	**VMFT %**
Couples with two children										
1	864306	971003	125.5	0.0	91.9	0.0	59.2	0.0	38.2	0.0
2	1691397	1833280	40.9	0.4	27.9	0.4	15.0	0.4	6.9	0.4
3	2122422	2320688	23.9	1.2	15.3	1.2	6.6	1.2	1.2	1.2
4	2552593	2884803	12.3	4.4	7.1	4.4	1.9	4.2	-1.4	1.2
5	2922703	3448228	6.8	8.4	3.5	8.4	0.4	5.4	-1.5	0.8
6	3459094	4104464	0.5	10.3	-0.8	8.4	-2.0	2.4	-2.6	-0.7
7	4042138	4906724	-4.5	9.9	-3.8	4.7	-3.2	0.5	-2.8	-1.2
8	4911492	6073781	-9.7	2.5	-7.2	-0.3	-4.8	-1.7	-3.3	-1.9
9	5957639	7675951	-12.4	-2.4	-8.3	-2.5	-4.1	-1.6	-1.5	-0.4
10	8735110	12188569	-12.8	-6.0	-5.9	-2.0	1.0	2.7	5.3	6.1
Overall mean	3730593	4649590	0.8	1.7	0.9	1.5	1.1	1.3	1.1	1.2
Couples with three children										
1	697657	811022	194.3	0.0	144.4	0.0	94.0	0.0	62.5	0.0
2	1555095	1707360	61.4	0.0	43.9	0.0	26.0	0.0	14.5	0.0
3	2033793	2185559	36.1	-0.2	24.5	-0.2	12.6	-0.2	4.9	-0.2
4	2493147	2754342	21.6	1.5	13.5	1.5	5.6	1.5	0.6	1.4
5	3053019	3439653	10.6	4.9	6.0	4.9	1.4	4.2	-1.4	0.8
6	3676934	4226644	2.3	8.2	0.3	8.0	-1.7	2.9	-3.1	-1.0
7	4333177	5203907	-2.8	10.3	-2.8	5.8	-2.9	1.0	-3.0	-1.2
8	5677032	6974084	-10.0	2.2	-7.6	-0.7	-5.1	-2.1	-3.5	-2.2
9	7284143	9488940	-12.6	-2.9	-8.0	-2.7	-3.5	-1.1	-0.6	0.4
10	13424778	20806905	-7.8	-2.7	1.4	4.3	10.6	11.9	16.3	16.9
Overall mean	4432462	5795302	3.4	1.5	4.5	3.0	5.5	4.5	6.2	5.5

Note: Generalized Lorenz curves differences relative to the reference scenario. 1999 disposable income is given per equivalent adult of the household. The percentages are differences relative to the reference scenario (1999 disposable income). BIFT and VMFT reforms collect the same tax revenue as in 1999.

5. Other Simulations

5.1 Description of Different Scenarios

As it has been mentioned before, debate continues regarding the appropriateness of a new reform of the Spanish system of redistribution. In fact, in 2003, the Popular Party implemented marginal changes of the PIT. The reform goes in the same direction as the 1999 one. It basically reduces the minimum and maximum marginal tax rate, increases the disabled people expenditure allowance, and raises the vital minimum (family and personal). On the other hand, a number of politicians from the Socialist party, with the support of some economists, recently proposed the introduction of a scheme similar to our VMFT. The underlying idea of simplifying the tax structure and introducing a sort of vital minimum gave rise to a great deal of debate on the eventual effects in terms of equity and efficiency. This proposal is currently under evaluation at the Spanish Ministry of Finances.

In this section, we simulate five possible reforms. The description of each reform is summarized in the following Table 11.

As before, the reforms only replace the PIT, leaving social contributions unaltered. The new elements introduced in the scenarios simulated are: 1) the consideration of a marginal tax scheme with two rates (the second tax rate is introduced for incomes up to 5,750,000 ptas. and tries to avoid those on higher incomes paying less income tax because of a low flat tax); 2) the introduction of tax credits that will replace the present tax allowance due to the employee social contributions and vital minimum, personal and family minimum (several economists have pointed out that a tax allowance benefits people with higher marginal taxes, while a tax credit is independent of the marginal tax faced by the individual); 3) keeing the tax credit due to house investment. Though some economists believe that this tax credit causes a distortion in the housing market (pushing up house prices and creating disincentives for house renters), the house investment tax credit has strong social support. Moreover, an immediate suppression of this deduction is very difficult, because a lot of tax payers have bought their house taking into account the existence of this deduction in the future.

Reforms 1 and 2 are very similar to two of the three reforms that the Socialist Party suggested in their report[11]. We have only modified the first marginal tax rate in order to obtain the same tax revenue as in our reference scenario, the 1999 system. They both consist of: a 100 per cent tax credit for employee social contributions, a vital minimum tax credit of 75,000 ptas. per person and 225,000 ptas. per family, and two marginal tax rates. They differ because reform 1 maintains the house investment tax credit, as in the 1999 system (see Table 4).

Reform 3 and 4 are similar to our BIFT and VMFT reforms, with a flat tax of 38 per cent — but including house investment and social contributions tax credits. The basic income and vital minimum that guarantees the 1999 tax revenue are 455,450 and 563,400 ptas. respectively. Reform 5 is a BIFT reform, with a basic income of 194,300 ptas per year and per adult equivalent and a flat tax of 25 per cent; it includes an extra marginal tax rate, of 40 per cent, for incomes over 5,750,000 ptas.

Table 11: Summary of Five Additional Tax Reform Options

	Reform 1	**Reform 2**	**Reform 3**	**Reform 4**	**Reform 5**
Tax allowances					
Vital minimum	No	No	No	563,400*	No
Tax credits					
Employee social contributions	Yes	Yes	Yes	Yes	No
House investment	Yes	No	Yes	Yes	No
Vital minimum:					
Ptas. per person	75,000	75,000	No	No	No
Ptas.per household	225,000	225,000			
Marginal Tax Rates					
	26.3%	25.55%	38%	38%	25%
over 5,750,000	+14%	+15%			+15%
Basic Income	No	No	455,450*	No	194,300*

*Notes: * Amounts are per equivalent adult, where the scale of equivalence used is the squared root of the number of the household members. In every case the reforms collect the same tax revenue as in 1999.*

5.1 Results

The results of the simulations of the five scenarios described above are presented in Table 12. . The first panel in Table 12 reports the Generalized Lorenz curve expressed in percentage changes from the reference situation (the 1999 scheme) by deciles of disposable income. The lower panel reports the inequality, redistribution and progressivity index.

In general, we observe that reforms 1, 2 and 4 have a marginal effect on the reduction of inequality. On the contrary the reforms 3 and 5 (both inspired by a basic income scheme) seem to improve substantially the equality of the income distribution. Under schemes 1 and 2, the disposable income of the first 8 deciles increases and only the last 2 deciles lose a small amount (less than 1 per cent). In any of these two scenarios, the percentage variation in disposable income (with respect to the 1999 scenario outcomes) is bigger than 1 per cent. Looking at the Gini and Reynold-Smolensky indexes we observe that inequality is reduced by an insignificant amount (see Table 12).

Reform 4 results in an increase in net income for the first seven deciles and a decrease for the last 3 deciles. The reduction in inequality is bigger than under scenarios 1 and 2, but it is still marginal. In general we observe that the replacement of the 1999 PIT with a linear (2 brackets) marginal tax rate (such as the one we used in simulations 1 and 2), or with a vital minimum and a flat

tax, as in simulation 4, does not produce any relevant effect on the net income distribution.

The story is completely different when we look at reforms 3 and 5. In these two cases the redistributive power of the two systems is much greater than under the 1999 system. This effect depends strongly on the introduction of the basic income.

Table 12: Impact of the Five Possible Reform Scenarios

	1999		Reform Number				
Decile	**Disposable income**	**Gross income**	1	2	3	4	5
	Generalized Lorenz curves differences relative to the reference scenario						
1	631,866	666,754	0.02%	0.02%	70.42%	0.02%	42.84%
2	1,135,848	1,173,391	0.17%	0.17%	18.37%	0.17%	7.41%
3	1,583,190	1,683,786	0.56%	0.61%	10.10%	0.64%	4.78%
4	1,991,181	2,153,832	0.57%	0.87%	4.55%	2.15%	2.54%
5	2,402,931	2,666,514	0.14%	0.56%	0.59%	4.05%	0.41%
6	2,868,149	3,298,190	0.83%	0.99%	-1.68%	3.70%	-0.44%
7	3,421,074	4,010,357	0.97%	1.16%	-3.73%	1.59%	-1.42%
8	4,148,550	4,989,131	0.93%	0.96%	-5.33%	-0.77%	-2.55%
9	5,261,016	6,491,807	-0.19%	-0.29%	-6.46%	-2.76%	-4.40%
10	8,570,309	11,724,108	-0.88%	-1.10%	-4.47%	-2.19%	-4.67%
Overall mean	3,201,954	3,886,975	0.14%	0.15%	0.04%	-0.09%	-0.57%
	Progressivity and Redistributive Measures						
Gini	0.330	0.374	0.329	0.329	0.283	0.322	0.300
Atk e=0.5	0.102	0.129	0.101	0.101	0.071	0.099	0.080
Atk e=0.9	0.229	0.268	0.228	0.228	0.120	0.225	0.137
Atk e=1.5	0.296	0.349	0.295	0.295	0.183	0.291	0.218
Atk e=2	0.525	0.575	0.524	0.524	0.229	0.522	0.282
Entr c=0.1	0.285	0.341	0.284	0.283	0.141	0.279	0.163
Entr c=0.5	0.209	0.267	0.208	0.207	0.145	0.203	0.163
Entr c=0.9	0.202	0.267	0.201	0.200	0.153	0.196	0.168
Entr c=2	0.246	0.374	0.248	0.247	0.212	0.244	0.221
Kakwani	0.220		0.221	0.225	0.439	0.252	0.350
Reynolds-Smolensky	0.046		0.046	0.046	0.091	0.053	0.075
T	0.172		0.171	0.171	0.172	0.173	0.177
t/(1-t)	0.208		0.207	0.207	0.208	0.210	0.215

Under scenario 3 the first half of the population observes an increase in their disposable income. The first decile's net income rises 70 per cent compared with the 1999 system. The deciles from 5 to 10 receive less net income than under the initial 1999 situation. An interesting outcome is that decile 9 loses more (4.47 per cent) than decile 10 (6.46 per cent). This is due to the fact that, under the 1999 system, the marginal tax rate for the 10^{th} decile of the distribution is higher than the flat tax used for this simulation.

If we look at the inequality index, we observe that the Gini goes from 0.33 in 1999 to 0.283 under reform 3. This is certainly an important reduction in the inequality of disposable income. We observe also that there is an important increase in the progressivity of the system: the Kakwani index goes from 0.22 to 0.439. The pattern of the results is the same when we look at reform 5. As in the previous case, the redistributive impact of this basic income flat tax + tax credits system is important. The reduction in inequality favours the first 5 deciles and, in particular, the first one (which experiences an increase in disposable income of 42 per cent with respect to the 1999 system). Looking at the Gini values, we observe a decrease in its value from 0.33 to 0.3. This means that reform 5 is more redistributive than the 1999 system but less than scheme 3. This is totally due to the size of the basic income transfer (which is 455.450 ptas in reform 3 and only 194.300 ptas in reform 5).

As in section 3, the results of all the simulations presented in this section show that higher redistributive effects are obtained by introducing a basic income. This mechanism represents a strong income injection for low-income households.

6. Conclusions

Using the microsimulation model GLADHISPANIA, we have simulated the redistributive effects on a sample of Spanish households coming from the 1995 ECHP panel, of various alternative scenarios (using as reference framework the 1999 Spanish income tax system). The scenarios simulated are a basic income-flat tax structure and a vital minimum-flat tax structure. Different variants have been analyzed and the main results indicate that both structures perform better than the 1999 system in reducing initial (market) income inequality. Results also show clearly that, if the objective of the fiscal authority is to reduce inequality, the instrument that achieves higher levels of redistribution is a basic income. The main reason for this is that the 1999 redistribution system is basically structured around the progressivity of the income tax. No subsidies (means tested or not) are implemented in order to guarantee a minimum level of income to poor households. The introduction of a basic income improves substantially the welfare of the lowest deciles of the income distribution. The cost of financing it depends on the amount of basic income given. The simulations show that a flat tax around 25-30 per cent can be enough to finance a good redistributive performance without incrementing the tax burden.

The results presented in this work are limited to the first order effects. No behavioral reactions are considered. Labor supply reactions can affect in an important way the final disposable income of the households and should be taken into account if the objective is to perform a robust welfare analysis of alternative redistributive schemes. Nonetheless, the use of arithmetical microsimulation models still remains a powerful instrument to assess the effects of alternative redistributive policies.

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[1] We define gross income as disposable income plus personal income taxes and social contributions paid by the employee. The hypothesis made to treat monthly withdrawals is that they correspond exactly to the effective average income tax paid by each individual at the end of the year.

[2] In some cases (maritime workers and certain types of government employees) the information needed to compute the social affiliation status was not available on the individual). The details of what was done in such cases can be found in Oliver and Spadaro (2002).

[3] The 1999 reforms were introduced by virtue of "Ley 40/1998 de 9 de diciembre, del impuesto sobre la renta de las personas físicas y otras normas tributarias".

[4] The equivalence scale used is the square root of the number of household members.

[5] For more details of the general properties of a basic income-flat tax scheme, see Atkinson (1995).

[6] It is important to stress that, in Spain, the main tax deductions (tax allowances and tax credits) are pension plans and house investment.

[7] These values are very close to the ones found by Castañer *et al.* (2001) using the "Panel de Declarantes por IRPF del Instituto de Estudios Fiscales". They are also very similar to values founded for Portugal by Farinha and Gouveia (1999), but they are relatively high if we compare them with other European countries.

[8] We have also tested change in tax progressivity and redistributive effect, using the Kakwani and Reynolds-Smolensky indexes. The figures are available from the authors, but reach the same conclusions as shown in Table 7 – namely that redistribution and progressivity under the 1999 scheme is always lower than in the BIFT and VMFT scenarios (except with VMFT-25 per cent) and that the differences are reduced when the flat tax is lower, as expected. If we compare the BIFT and the VMFT we still observe that the BIFT scheme is much more progressive and redistributive than the VMFT.

[9] For us, couples means two adults living in the household, whether they are the parents or not, because we are interested in seeing how many people can earn income.

[10] Following the economic classification given by the ECHP, we consider as dependent children all the children below 16 years old or between 16-25 if they live with his/her mother/father and they are inactive or unemployed.

[11] "Una alternativa fiscal para España". Report of an independent committee realized for the PSOE. May 2002.