Ability to pay adjusted by the cost of living in the Spanish personal income tax

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Abstract

This paper defines and evaluates a new tax method based on the combination of a flat rate scheme and increasing personal allowances on the tax base which we refer to as Discretionary Income Tax Method (DITM) against the traditional personal income tax based on progressive tax schedules. The results show from a theoretical perspective that our proposal is more progressive and social welfare enhancing. For the empirical validation of our results we carry out an exercise comparing the Spanish personal income tax (SPIT) with our tax method alternative (DITM). The results of our empirical exercise are in line with the theoretical predictions of the 'objective taxation' here described and derived from the comparison of the two tax methods.

Keywords: increasing personal allowances, tax method**,** necessary consumption, social welfare, progressivity, Lorenz curves

JEL Classification: D31, D63, H24

1. INTRODUCTION

Traditionally, the search for progressivity has been pursued through tax rates (formal progressivity). However, personal allowances are very effective tools that allow reaching a fairer distribution of tax burdens without using complex progressive tax scales (Tanzi, 2009). Additionally an improvement in horizontal equity in the treatment of personal and family circumstances can be achieved (Sánchez Tejeda, 2006; IEF, 2002) by avoiding the disincentive effects due to jumps in the tax scale. The use of these allowances fits in the present goal of tax simplification pursued in the current Public Finance literature (Auerbach, 2006; OCDE, 2006, Banks and Diamond, 2008) and simultaneously preserves high degrees of progressivity.

The traditional conception of personal allowances based on a strict minimum of nontaxable income equal for all taxpayers has been recently questioned. Keen et al (2000) demonstrates that, when tax rates are proportional and personal allowances have income elasticity lower than one, the use of increasing personal allowances (IPAs) according to the different levels of income would lead to a better after-tax income distribution (see Faiña et al., 2011, 2013b).

Furthermore, the use of increasing personal allowances has a strong justification in terms of a redistributive criterion. Its foundation lies on the portion of income that would be subtracted for the households' consumption of priority goods and services the so called necessary consumption. This idea, although has its roots in the classical political economy (Adam Smith, 1776; Stuart Mill, 1848) in recent years the concept of necessary consumption has moved towards a more flexible definition leaving behind the assumption that the basic needs of individuals should be the same for everyone. This is

what has been recently called the Rousseau's paradox of fiscal egalitarianism (Faiña et al, 2011, 2013b).

In this paper, we propose an alternative tax method which we will refer to as Discretionary Income Tax Method (DITM). main differences with the traditional personal income tax are based on the treatment of personal allowances (increasing personal allowances, as opposed to a strict minimum of nontaxable income equal for everyone) and on the tax scheme (flat rates versus a complex combination of progressive and flat tax rates). The change of a tax system with increasing marginal rates to one with flat rate reduces both the costs of inspection and management and tax complexity and, therefore, generates positive effects on tax compliance. Moreover, this alternative proposal presents several advantages. First, the use of flat rates creates a simpler and more transparent fiscal system by reducing unintended errors. Second, the simplification of the tax structure increases the probability of being inspected and, consequently, reduce tax evasion (Panadés, 2012). Thus, in countries such as Russia, where it has moved from a tax schedule to a single flat rate (without personal allowances), tax compliance has improved on average by more than 10% (Ivanova et al, 2005; Gorodnichenko et al, 2007). The main detractors argue that the use of flat rates reduces the initial progressivity of the tax system and therefore the redistribution of income will be lower (Freire-Seren and Panadés, 2008). However, our tax method not only uses flat rates but also incorporates a scheme of increasing personal allowances (IPAs), which will be proxied by the amounts of necessary consumption required by the different living standards of the taxpayers. Thus, we have an element (IPAs) which incorporates progressivity into the income tax (Keen et al, 2000; Faiña et al, 2011). In summary, our proposal (DITM) combines the benefits of simplicity seen above with the gains in terms of progressivity and after-tax social welfare. We incorporate this

alternative proposal within what we refer to as call 'objective taxation'. This theory looks theory which looks for progressivity based on the consumption patterns of the taxpayers instead of the traditional tax schedules which are chosen in a discretionary way by the decision-makers. In other words, we incorporate taxpayers' behavior to incorporate objective measures in the evaluation of personal income tax in terms of progressivity and social welfare.

~~Therefore,~~ Our results show from a theoretical point of view that our tax method is more progressive and social welfare enhancing than the traditional personal income taxes of most developed countries (Atkinson criteria, 1970). To validate our theoretical results, we carry out an exercise using the 2006 personal income tax data of Spanish taxpayers[1] and comparing the outcomes in terms of welfare and progressivity with our alternative tax method proposal, DITM. . The results of the empirical exercise are in line with the theoretical propositions arising from the comparison of the two tax methods.

The rest of the paper is structured as follows: section 2 presents our alternative proposal in personal income tax called Discretionary Income Tax Method (DITM) along with the patterns followed by two key elements in our proposal: necessary consumption and discretionary income. Section 3 proves theoretically that the DITM is more progressive and social welfare enhancing than the traditional schemes of personal income tax based on a progressive tax schedule and fixed personal allowances. Section 4 applies the theoretical results to the Spanish case in several steps. First, we very briefly describe the structure of the 2006 Spanish Personal Income Tax (SPIT) against the structure of our

[1] Spanish Personal income tax information is based on the micro-data from the 2006 Spanish Household Budget Survey (SHBS) and the corresponding Sample of Taxpayers from the Spanish Institute for Fiscal Studies (IEF)

alternative tax method (DITM). Then, we construct our DITM proposal, dealing with the treatment of IPAs by resorting to the concept of necessary consumption. We calculate the priority goods and services and therefore the estimation of a necessary consumption function for the Spanish households in 2006. Finally, we compare both tax methods (DITM and SPIT) from an empirical point of view showing that the theoretical results (we demonstrate that DITM is more progressive and superior in terms of social welfare than the 2006 SPIT) are in line with the empirical results we obtain using the micro-data from the 2006 Spanish Household Budget Survey and the 2006 Sample of Taxpayers of the Spanish Institute for Fiscal Studies. Section 5 contains the main conclusions and policy implications.

2. Discretionary Income Tax Method (DITM) as an alternative proposal in personal income taxes

2.1. Increasing Personal Allowances (IPAs): An interpretation based on the concept of necessary consumption

The traditional concept of a strict minimum of nontaxable income equal for all taxpayers, embedded in most current income-tax systems, can be easily questioned on account of the concept of priority needs, which are the base for defining the concept of a strict minimum of nontaxable income. This kind of needs, in modern societies and according to the values and habits of households increase with income and therefore a close definition of them cannot be given. This concept which can be termed as necessary consumption (NC) will be one of the key elements to determine the amount of personal allowances in our tax method proposal. However, the use of this concept was considered unfair in most tax systems since priority needs are understood to be the same for all individuals. A clear-cut illustrative way to express the former idea can be

seen in the following Rousseau's words (1755): *"He who possesses only the common necessaries of life should pay nothing at all, while the tax on him who is in possession of superfluities may justly be extended to everything he has over and above the mere necessaries. To this he will possibly object that, when his rank is taken into account, what may be superfluous to a man of inferior station is necessary for a grandee. But this is false: for a grandee has two legs just like a cow-herd, and, like him again, but one belly."* Moreover, increasing personal allowances (IPAs) could apparently prompt us to think that the income tax would take a regressive nature since they would mean higher deductions for high income earners. However, Faíña et al (2011) have proved that using increasing personal allowances as opposed to a strict minimum of non-taxable income equal for all taxpayers in personal taxation leads to a fairer after-tax income distribution and they have termed this result as the Rousseau's paradox of fiscal egalitarianism.

Mathematically, given a set of goods and services, j=1…m, and denoting by "$x_j(y)$" the expenditure allocated to each type of goods as a function of personal incomes "y", the subset of necessary goods can be defined as[2]:

$$\left\{x_i = 1...n \,/\, \varepsilon_{x_i} < 1\right\} \text{ with } n < m \tag{1}$$

where ε_{x_i} represents the income-elasticity of the expenditure in good x_i which is given by the following expression:

$$\varepsilon_{x_i} = \frac{dx_i / dy}{x_i / y} < 1 \Leftrightarrow \frac{x_i}{y} > \frac{dx_i}{dy} \Leftrightarrow S_{x_i} > s'_{x_i} \tag{2}$$

[2] "x_i" represents the expenditure in the good "i" in monetary terms.

As it can be seen on the right hand expression (2), by rearranging the definition of income elasticity, we get that the average expenditure shares in necessary goods, S_{x_i}, are greater than the corresponding marginal expenditure shares, s'_{x_i}. This implies that the average expenditure shares in necessary goods, S_{x_i}, are a decreasing function of personal income (*y*). This technical condition captures the intuitive idea that priority needs are the ones that are first met.

Once the set of necessary goods has been determined $\{x_i\}_{i=1\ldots n, n\in m}$, necessary consumption for each household, $NC_j(y_j)$, can be computed summing over the amounts of household expenditure to buy necessary goods and services in the set $\{x_i\}_{i=1\ldots n, n\in m}$ according to the following expression:

$$NC_j(y_j) = \sum_{i=1}^{n} x_i(y_j) \text{ with j=1,…,R} \quad (3)$$

where j represents households. The average share of necessary consumption, $SNC_j(y_j)$, can be given by the proportion of necessary consumption over total household income:

$$SNC_j(y_j) = \frac{NC_j(y_j)}{y_j} \quad (4)$$

The marginal share of necessary consumption, $sNC_j(y_j)$, can be given by the proportion of additional income that is spent in necessary goods. Mathematically it is given by differentiating expression (3) with respect to income:

$$sNC_j(y_j) = \frac{dNC_j(y_j)}{dy_j} \quad (5)$$

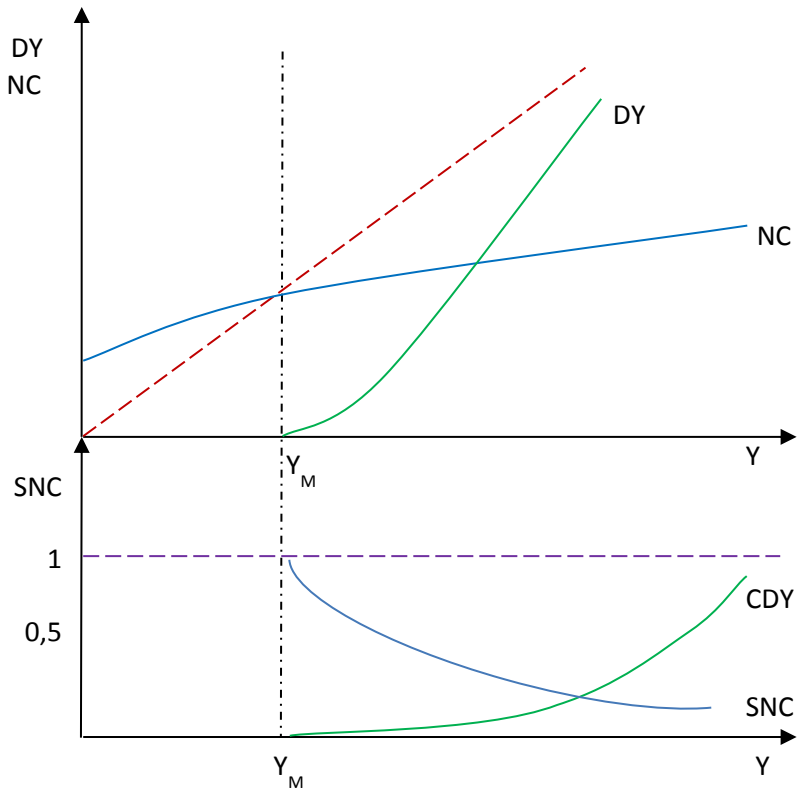
Using expressions (4), (5) and the condition on income elasticity that must be satisfied by the expenditures in necessary goods, we can derive the following expression:

$$1 > \varepsilon_{NC} = \frac{sNC_j(y_j)}{SNC_j(y_j)} \Rightarrow SNC_j(y_j) > sNC_j(y_j) \qquad (6)$$

Expression number (6) implies that the income elasticity of necessary consumption is lower than 1 and therefore the average share of necessary consumption on income, $SNC_j(y_j)$, is a decreasing function of personal incomes.

Figure 1 shows the pattern followed by discretionary income (DY) and necessary consumption (NC) with respect to total income. It can be seen that NC, which is our proxy for IPAs, grows less than proportional as income rises. Necessary goods and services are associated with basic priorities (food, beverages, shoes, etc.) which take most of household budgets for low income levels.

Figure 1. Necessary goods and average expenditure shares



Source: Own elaboration

As income grows households increase the expenditure devoted to basic priorities (increasing the degree of satisfaction of these needs) but also allocate growing amounts

of expenditure to the satisfaction of non-basic priorities (cars, trips, vacations and the like). According to household values and current consumption patterns, the demand for necessary goods becomes rigid with respect to income. The rationale behind this behavior is based on the fact that priority or basic needs are those that are first met. When income is low and the budgetary constraint is tight the optimal consumer decisions focus on priority or basic needs. When income grows and budgetary constraints are not so severe, other needs but of lower priority are also met.

Therefore, as it can be seen in the bottom part of Figure 1 if we measure the share of necessary consumption over total income (SCN=NC/Y), the pattern followed by this share tells us that it ranges from a value of 1 for the lowest income brackets and approaches asymptotically to 0 for the highest income brackets. From SCN, it is easy to plot the pattern followed by the coefficient of discretionary income (CDY=1-SCN), which can be considered as a measure of the ability to pay taxes. The CDY line shows very clearly that, as income rises, CDY grows at higher and higher rates. This behavior is in line with the progressive nature of our tax method since CDY is the proportion of discretionary income over total income (CDY=DY/Y) and for high income earners practically all income is taxable income. The pattern followed by CDY is in the line with the pattern shown by the DY line in the upper part of the chart.

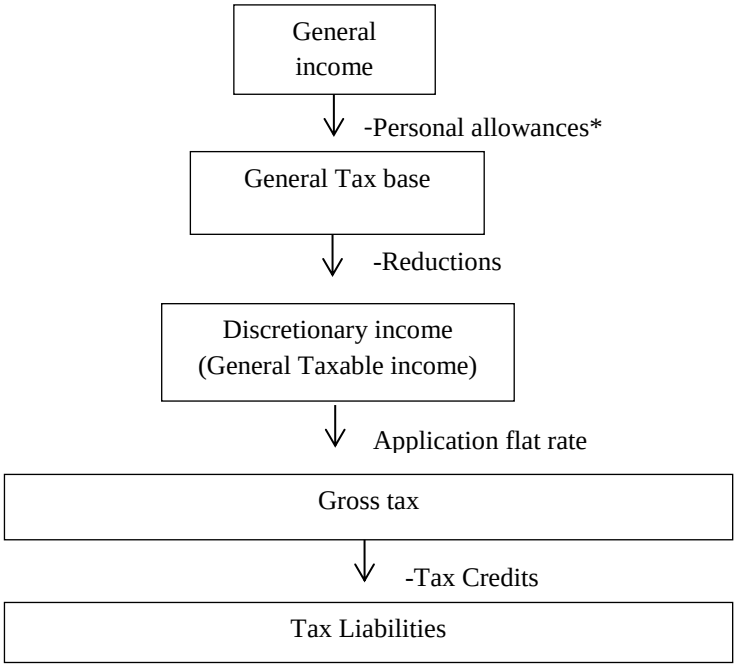
2.2. Discretionary income as a measure of taxable capacity

Discretionary income is defined in our proposal as the total income exceeding necessary consumption, i.e., total income minus increasing personal allowances. Therefore, we consider that what we refer to as discretionary income will be our taxable income (Faiña et al., 2013a). Mathematically:

$$DY_j = Y_j - NC_j(y_j, hs_j) \tag{7}$$

Against the traditional scheme based on progressive personal income taxes, our alternative proposal, which we refer to as discretionary income tax method (DITM -a tax method based on increasing personal allowances) will lead to a more progressive and also more social welfare enhancing tax scheme with a much simpler tax structure (flat rates). Figure 2 shows the structure of our alternative tax method DITM.

Figure 2. Scheme of alternative tax method: DITM



Source: Own elaboration

*Personal allowances are based on the estimation of a necessary consumption function which considers increasing personal amounts as income rises.

3. Discretionary income tax method: analysis in terms of progressivity and social welfare

In this section we compare our tax method proposal with devises IPAs using a flat tax over discretionary income (DITM) with the traditional schemes embedded in most developed countries which features personal allowances based on a strict minimum of nontaxable income equal for all taxpayers and a complex structure using a progressive

schedule for general income. In this sense, NC has a fully meaning in fiscal terms since it identifies the current personal and family basic needs of the taxpayers' living standards with a value in terms of personal allowances.

We demonstrate under what conditions our tax method proposal (DITM) is more progressive and social welfare enhancing than the traditional schemes based on progressive tax rates in personal income taxes. The evaluation of the economic welfare of two tax methods can be carried out by applying the Atkinson theorem, (Atkinson 1970). In order to apply this criterion the following assumptions are made: 1) social welfare functions must be individualistic, symmetric, additively separable and inequality averse social welfare functions, 2) after-tax income liabilities must have the same mean under both tax methods. This last assumption applied to our goals means that total tax collection must be the same under the two tax methods. If these two conditions are fulfilled, the Atkinson criteria proves that when we compare two income distributions which have the same average, the one showing a more equal distribution applying Lorenz criterion will be clearly superior in terms of social welfare.

We denote as Traditional Personal Income Tax (TPIT) a tax method which features a strict minimum of personal allowances equal for everyone and progressive tax rates. Let us define $y \in [a, m]$ as the total income under both tax methods being a the lowest income level, which we will associated with the amount of fixed personal allowances in the TPIT, and m the highest income level.

3.1. DITM in terms of progressivity

The first step is to analyze when our proposal (DITM) is more progressive than the TPIT. Let us denote TL_{TPIT} and TL_{DITM} as the tax liabilities for the TPIT and DITM, respectively.

Total tax liabilities can be obtained by the following expression:

$$TL_{TPIT} = t(y)\left[y - PA\right] \tag{8}$$

where:

y: total income corresponding with the general income with $y \in \left[PA, m\right]$

PA: personal allowances in the TPIT (strict minimum of nontaxable income equal for all taxpayers)

t(y): progressive rate

Total tax liabilities under our tax method proposal (DITM) are given by (see Figure 2):

$$TL_{DITM} = t_d\left[y - NC(y, hs)\right] \tag{9}$$

where:

y: total income corresponding with the general income with $y \in \left[PA, m\right]$

NC(y, hs): necessary consumption (as we defined in section 2)[3]

DY (discretionary income): aggregate of discretionary income which is the sum of incomes exceeding NC(y, hs), for the whole set of taxpayers

t_d: flat rate on discretionary income

The degree of progressivity of the TPIT and DITM can be compared by means of their average tax rates. Following Musgrave and Thin (1948), average tax rates are considered to be progressive if they increase as income increases. For this analysis we

[3] The expression 2 'hs' refers to the household size. Since personal allowances of current income taxes take into consideration the economies of scale in the total expenditure generated within the household (as we will see in section 4) we also consider this aspect in our personal allowances.

denote $y = y - PA$ because we will consider only income levels above the personal allowances. Therefore, we rewrite equations 8 and 9 in the following way:

$$TC_{TPIT} = t(y).y \qquad \text{with } y > PA \tag{10}$$

$$TC_{DITM} = t_d.DY = t_d(y - NC(y, hs)) \quad \text{with } y > PA \tag{11}$$

The average tax rate for the TPIT is given by the following expression:

$$tme_{TPIT} = t(y) \tag{12}$$

In the case of DITM, the average tax rate is more complex:

$$tme_{DITM} = \frac{t_d(y - NC(y, hs))}{y} = t_d\left(1 - SNC\right) \text{with } y \geq NC(y) \geq PA \tag{13}$$

It is straightforward to verify that the two taxes are progressive according to the Musgrave and Thin's criteria. In the case of TPIT, the existence of a tax schedule implies itself that the average rate increases as income rises. In the case of DITM, t_d is a flat rate but the presence of IPAs provides tax progressivity. Thus, for low income, the value of SNC is close to unity and, therefore, the average rate is near to zero. As income increases, SNC decreases to a value close to zero and the average rate increases to the maximum value, t_d[4].

To make a meaningful comparison of both tax methods, we must impose the condition that the total tax revenues must be the same. Mathematically:

$$TC_{TPIT} = TC_{DITM} \Leftrightarrow t(y).y = t_d(y - NC(y)) \tag{14}$$

[4] Bear in mind that $0 < SNC < 1$ (see Figure 1) such that when y→0, SNC=1 and, therefore, 1-SNC=0. On the contrary, when y→∞, SNC=0 and, consequently, 1-SNC=1.

Simplifying:

$$\frac{t(y)}{t_d} = \frac{y - NC(y, hs)}{y} < 1 \tag{15}$$

It can be easily verified that the right hand of expression 15 is lower than 1 and therefore the tax rate under our proposal DITM, t_d, must be greater than the tax rate for the TPIT, t(y), for each taxpayer:

$$t(y) < t_d \tag{16}$$

Taking into account that a tax method A is more progressive than a tax method B if the variation on the average tax rate of tax method A is greater than tax method B (Pigou, 1928), we can compare the progressivity of SPIT and DITM by deriving the average tax under both tax methods in equation 12 and 13.

$$\frac{dtme_{TPIT}}{dy} = \frac{dt(y)}{dy} = tma_{TPIT} \tag{17}$$

$$\frac{\partial tme_{DITM}}{\partial y} = t_d^{'} \left(\frac{-\partial NC(y) / \partial y . y + NC(y)}{y^2} \right) = tme_{DITM}(SNC - sNC) \quad [5] \tag{18}$$

Therefore, our proposal will be superior with respect to SPIT when $\frac{dtme_{TPIT}}{dy} < \frac{\partial tme_{DITM}}{\partial y}$

, i.e., taking into account equations (17) and (18):

$$\frac{tma_{TPIT}}{tme_{DITM}} < SNC - sNC \tag{19}$$

[5] This expression presents positive values due to the fact that SNC> sNC, an implication which comes from the definition of necessary consumption -income elasticity lower than one- (see Equation 6).

Consequently and taking into account that 0<SNC-sNC<1 (see equation 6), DITM will be more progressive than TPIT if the following condition applies:

$$\frac{tma_{TPIT}}{tme_{DITM}} = \frac{t_i}{tme_{DITM}} < 1 \qquad \forall i = 1,...,n \tag{20}$$

being t_i each marginal taxe rate in the schedule.

3.2. DITM in terms of social welfare

Our second step is to demonstrate that, according to the Atkinson criteria (1970), our proposal (DITM) could be social welfare enhancing in comparison with the TPIT). Let us denote by F(y) a cumulative distribution function of income:

$$F(y) = \int_a^y f(y)dy \tag{21}$$

In order to apply Atkinson's theorem (1970), we are going to consider a twice continuously differentiable, additively separable, symmetric and with inequality aversion utility function, U(y), to build a social welfare function, W, of individual incomes.

$$W = \int_a^m U(y).f(y)dy, \forall U(y):\left[U'(y) > 0, U''(y) < 0\right] \tag{22}$$

For any social welfare function of the type W and taking into account equation 8 and 9, the after-tax income distribution under our tax method proposal is more equal than the after-tax income distribution under the TPIT when the following condition is satisfied (Atkinson, 1970):

$$\int_a^m U(y - TL_{TPIT}).f(y)dy \le \int_a^m U(y - TL_{DITM}).f(y)dy \tag{23}$$

The verification of the fulfillment of the theoretical condition in expression 23 is similar to prove the verification of the criterion of Lorenz dominance proposed by Atkinson (1970) which states that if two distributions have the same mean, the one closer to the equal distribution (bisector) is preferred. The former criteria can be applied to our case since we have imposed the condition of equal tax revenues under both tax methods which obviously implies the same mean. Therefore, mathematically speaking we have to demonstrate that the following condition holds true when we compare the TPIT with the DITM:

$$\alpha_{(y-TL)TPIT}\,\rho(y) \leq \alpha_{(y-TL)DITM}\,\rho(y) \tag{24}$$

where $\alpha_{(y-TL)TPIT}$ represents the cumulative shares of after-tax incomes under the TPIT, $\alpha_{(y-TL)DITM}$ the corresponding one under the DITM and $\rho(y)$ the cumulative shares of taxpayers ordered by their income levels. The technicalities of the Lorenz curve imply that $\rho(y)$ is an increasing function of *y* and at the maximum income level, *m*, $\rho(y)$ is equal to 1.

Cumulative tax liabilities for taxpayers with an income equal or lower than $y, \rho(y)$, under the TPIT are given by:

$$TL_{TPIT}(\rho_y) = \int_a^y t(y)(y - PA)\, f(y)dy \tag{25}$$

Total tax revenues in the TPIT are given by:

$$TL_{TPIT}(\rho_m) = \int_a^m t(y)(y - PA)\, f(y)dy = t(y)\left[Y - PA\right] \tag{26}$$

Cumulative tax liabilities for taxpayers with an income equal or lower than y, $\rho(y)$, are under DITM given by the following expression:

$$TL_{DITM}(\rho_y) = \int_a^y t_d \left[y - NC(y, hs) \right] f(y) dy \tag{27}$$

Total tax revenues under the DITM are given by:

$$TL_{DITM}(\rho_m) = \int_a^m t_d \left[y - NC(y, hs) \right] f(y) dy = t_d \left[Y - NC(y, hs) \right] = t_d .DY \tag{28}$$

After-tax income distribution under the TPIT and DITM are computed by subtracting the corresponding tax liabilities, TL_{TPIT} and TL_{DITM}, from personal income, Y. Consequently, their respective expressions are given by:

$$Y - TL_{TPIT} = Y - t(y)\left[y - PA \right] \tag{29}$$

$$Y - TL_{DITM} = Y - t_d \left[y - NC(y, hs) \right] \tag{30}$$

The cumulative after-tax income distributions under the TPIT, $Y_{t_s}(y)$, and DITM, $Y_{t_d}(y)$, are respectively given by the following expressions:

$$Y_{t_s}(y) = \int_a^y \left[y - t'_s (y - a) \right] f(y) dy = \int_a^y y.f(y) dy - t'_s \int_a^y (y - PA) f(y) dy \tag{31}$$

$$Y_{t_d}(y) = \int_a^y \left[y - t_d (y - NC(y, hs) \right] f(y) dy = \int_a^y y.f(y) dy - t_d \int_a^y \left[y - NC(y, hs) \right] f(y) dy \tag{32}$$

So the corresponding income shares, $\alpha_{t_i} \rho(y), i = TPIT, DITM$, in the after-tax income distribution Lorenz curves for TPITM and DITM are respectively given by:

$$\alpha_{t_{tpit}(y)} \rho(y) = \frac{\int_a^y y.f(y) dy - \int_a^y t(y)(y - PA) f(y) dy}{\int_a^m y.f(y) dy - \int_a^m t(y)(y - PA) f(y) dy} = \frac{\int_a^y y.f(y) dy - \int_a^y t(y)(y - PA) f(y) dy}{Y - t(y)\left[Y - PA \right]} \tag{33}$$

$$\alpha_{t_{ditm}}\rho(y)=\frac{\int_a^y y.f(y)dy-t_d\int_a^y\left[y-NC(y,hs)\right]f(y)dy}{\int_a^m y.f(y)dy-t_d\int_a^m\left[y-NC(y,hs)\right]f(y)dy}=\frac{\int_a^y y.f(y)dy-t_d\int_a^y\left[y-NC(y,hs)\right]f(y)dy}{Y-t_d.DY}$$

(34)

According to equation 24 or, equivalently, taking into account expressions 33 and 34, the following condition must be hold:

$$\frac{\int_a^y y.f(y)dy-\int_a^y t(y).(y-PA)f(y)dy}{\int_a^y y.f(y)dy-t_d\int_a^y\left[y-NC(y,hs)\right]f(y)dy}\le\frac{Y-t(y).(Y-PA)}{Y-t_d.DY} \qquad (35)$$

The condition of keeping the same amount of tax revenues under the two tax methods lead us to the following expression:

$$t(y).(Y-PA)=t_d.DY\rightarrow t(y)=\frac{DY}{(Y-PA)}t_d \qquad (36)$$

Taking into account that DY<Y-PA (since NC(y,hs) is an increasing function with income), this result implies:

$$t(y)<t_d \qquad (37)$$

Substituting expression 36 in expression 35 and dividing by the aggregate before-tax income, *Y*, we obtain the following expression:

$$\frac{\frac{\int_a^y(y)f(y)dy}{Y}-\frac{\frac{DY}{(Y-PA)}t_d\int_a^y(y-PA)f(y)dy}{Y}}{\frac{\int_a^y(y)f(y)dy}{Y}-t_d\frac{\int_a^y\left[(y-NC(y,hs)\right]f(y)dy}{Y}}\le\frac{\frac{Y}{Y}-\frac{DY}{(Y-PA)}\frac{(Y-PA)}{Y}t_d}{\frac{Y}{Y}-t_d\frac{DY}{Y}}$$

(38)

The right hand side of inequality (38) is equal to 1. Therefore this inequality implies:

$$\frac{\int_a^y (y) f(y)dy}{Y} - \frac{\frac{DY}{(Y-PA)} t_d \int_a^y (y-PA) f(y)dy}{Y} \leq \frac{\int_a^y (y) f(y)dy}{Y} - t_d \frac{\int_a^y [y - NC(y,hs)] f(y)dy}{Y} \quad (39)$$

and simplifying, it results:

$$t_d \frac{\int_a^y [y - NC(y,hs)] f(y)dy}{Y} \leq \frac{\frac{DY}{(Y-PA)} t_d \int_a^y (y-PA) f(y)dy}{Y} \quad (40)$$

$$\frac{\int_a^y (y - NC(y)) f(y)dy}{\int_a^y (y - PA(y)) f(y)dy} \leq \frac{DY}{(Y-PA)} \quad (41)$$

In conclusion, since NC(y, hs)>PA, this result clearly holds across the whole relevant range of incomes (*PA, m*].

4. Discretionary Income Tax Method: A comparison with the 2006 Spanish personal income tax (SPIT)

In this section we consider the case of Spain as an illustrative example of the traditional personal income tax (TPIT) which is present in many developed countries. We therefore compare the 2006 Spanish personal income tax (from here onwards SPIT) with our proposal based on increasing personal allowances (IPAs) and a flat rate tax. First, we briefly explain the configuration of the Spanish Personal Income Tax, (SPIT) for the year 2006. Then, we compute necessary consumption by using the Spanish Household Budget Survey (SHBS) elaborated by the Spanish National Institute for Statistics (INE) in order to implement our alternative proposal, (DITM). Finally, we compare the 2006 SPIT with our alternative proposal (DITM) in terms of progressivity and social welfare..

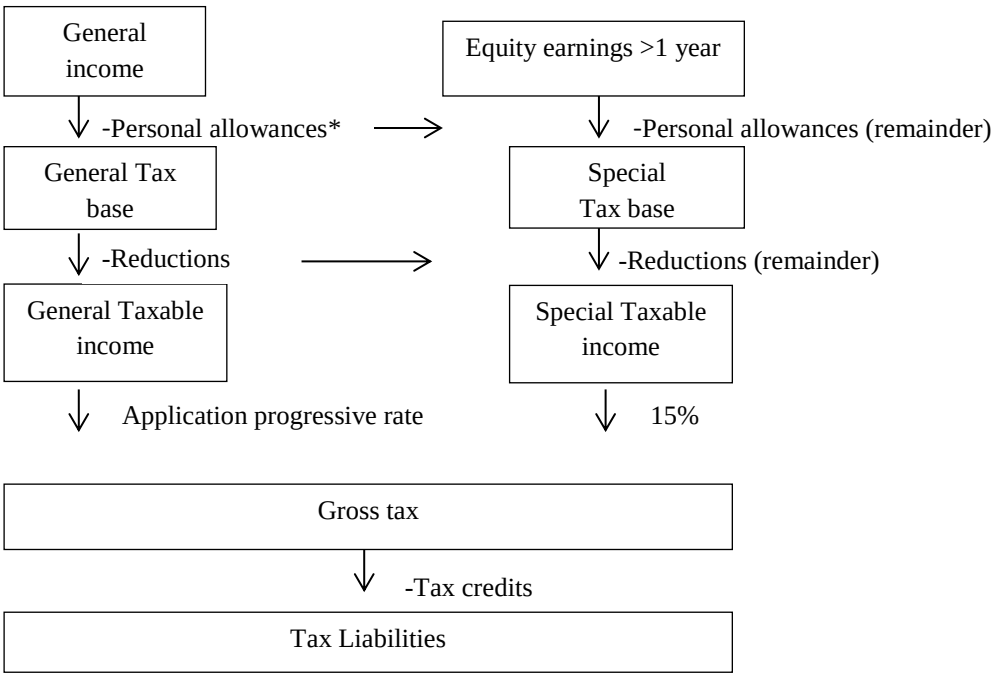
4.1. The 2006 Spanish personal income tax

The comparison exercise between SPIT and DITM is primarily based on the 2006 Spanish taxpayers' data which is collected by the Institute for Fiscal Studies (IEF). These data include information about quantity of tax base, tax liabilities, effective rates and total collection for 964,489 taxpayers (individual taxpayers plus joint taxpayers). In our analysis, we decide to select the individual income tax forms (650,440 forms) for technical reasons and also for comparability issues with our alternative tax method[6]

The structure of tax collection in the 2006 SPIT is very complex due to the difficulties in determining personal allowances which depend upon the personal and family circumstances of taxpayers and also the existence of two different treatments according to the source of personal incomes: a progressive tax rate on general income and a flat rate for equity earnings. Moreover, their administrative costs are very high (see OECD, 2009, pp. 87-88). Figure 3 shows the pattern followed to calculate the total tax liabilities in the 2006 SPIT. It is important to bear in mind that, in the 2006 SPIT, personal allowances are considered as a *strict minimum of nontaxable income equal for all taxpayers* which are incorporated as a reduction on the taxpayers' tax base. Therefore, the share of personal allowances over tax base decreases as income grows, leading to a progressive tax scheme.

[6] For more details, see Footnote 17

Figure 3. Scheme of SPLIT in 2006



Source: Adapted from Picos et al (2009)

*Personal allowances are based on a strict minimum of nontaxable income equal for all taxpayers

4.2. Increasing personal allowances (IPAs) and Necessary consumption: The DITM proposal

In this subsection we apply the DITM proposal for the Spanish case. In order to implement the concept of increasing personal allowances (IPAs) in personal taxation, we have previously to define a metric to compute them. This metric requires a three step procedure: fist, we have to introduce the concept of necessary consumption, second, based on the previous definition, we have to identify those goods and services which belong to this bundle and third, we have to estimate a necessary consumption function according to income levels and households' size.

4.2.1. Identification of necessary goods and services: the case of the 2006 Spanish Household Budget Survey (SHBS)

Based on the definition given in the previous sections, we are going to identify those goods and services considered necessary using the information provided by the 2006 Spanish Household Budget Survey (SHBS). This survey, elaborated by the Spanish National Institute for Statistics (INE), provides information regarding to Household features, Household expenditures and Household size (number of members) for a sample of 19,425 households, being the number of variables 278[7]. Household consumption in this survey is organized according to the COICOP classification[8] containing expenditure data on 12 labels at a five disaggregation level[9]. In our analysis, for easy of computations, we have worked with the COICOP classification at a three-digit level (48 items) in order to identify the list of necessary goods and services in the 2006 (SHBS).

The identification of necessary goods is based on the computation of the income elasticity for the different items included in the three-digit COICOP classification. The income elasticity is given by running a bivariate double-logarithmic regression of the expenditure in each item against each total household expenditures[10]:

[7] For a more detailed information about the Spanish Household Budget Survey see www.ine.es

[8] The Classification of individual consumption by purpose, abbreviated as COICOP, is a nomenclature developed by the United Nations Statistics Division to classify and analyze individual consumption expenditures incurred by households, non-profit institutions serving households and general government according to their purpose. It includes categories such as clothing and footwear, housing, water, electricity, and gas and other fuels.

[9] Annex (Table A) contains more detailed information on the COICOP classification.

[10] We have used the traditional methodology (Houthakker and Taylor, 1970) of working with total expenditures instead of total incomes to estimate the income elasticities of the different groups of goods and services.

$$Lnx_{ij} = \alpha_j + \beta_i \ln y_j + \varepsilon_j \quad (42)$$

where x_{ij} denotes the expenditure in item $x_i = \{1,...,m\}$ for household j, y_j total household expenditure, β_i is the income elasticity of the good x_i and ε_j is the error term.

Equation 42 was estimated for a sample of 48 goods included in the COICOP at the three-digit level and the resulting estimations of the β_i parameter allow us to identify necessary goods as those satisfying that β_i are lower than one.

Table 1 shows the results of the estimation of equation 42. The last column breaks down goods and services into necessary goods and non-necessary goods.

Table 1. Types of goods and services (COICOP classification (three-digit level))

COICOP (three-digit level)	Item	β_i	P>|t|	Type of goods	
				NG	NNG
e_11	Food	0,544 (0,006)	0	X	
e_12	Non-alcoholic beverages	0,565 (0,012)	0	X	
e_21	Alcoholic beverages	0,446 (0,024)	0	X	
e_22	Tobacco	0,380 (0,021)	0	X	
e_23	Narcotics	0,252 (0,605)	0,678		X
e_31	Clothing	0,999 (0,015)	0	X	
e_32	Footwear	0,738 (0,020)	0	X	
e_41	Actual rentals for housing	-0,432 (0,095)	0		X
e_42	Imputed rentals for housing	0,203 (0,004)	0		X
e_43	Maintenance and repair of the dwelling	0,430 (0,052)	0	X	
e_44	Water supply and miscellaneous services relating to the dwelling	0,433 (0,009)	0	X	
e_45	Electricity, gas and other fuels	0,383 (0,007)	0	X	
e_51	Furniture and furnishings, carpets and other floor coverings	1,019 (0,047)	0		X
e_52	Household textiles	0,586 (0,042)	0	X	
e_53	Household appliances	0,454 (0,035)	0	X	
e_54	Glassware, tableware and household utensils	0,483 (0,048)	0	X	
e_55	Tools and equipment for house and garden	0,631 (0,035)	0	X	

e_56	Goods and services for routine household maintenance	0,735 (0,017)	0	X	
e_61	Medical products, appliances and equipment	0,687 (0,027)	0	X	
e_62	Out-patient services	0,743 (0,041)	0	X	
e_63	Hospital services	1,027 (0,258)	0		X
e_71	Purchase of vehicles	3,326 (0,094)	0		X
e_72	Operation of personal transport equipment	1,140 (0,018)	0		X
e_73	Transport services	0,738 (0,025)	0	X	
e_81	Postal services	0,444 (0,077)	0	X	
e_82	Telephone and telefax equipment	0,389 (0,056)	0	X	
e_83	Telephone and telefax services	0,601 (0,007)	0	X	
e_91	Audio-visual, photographic and information processing equipment	0,929 (0,025)	0	X	
e_92	Other major durables for recreation and culture	0,787 (0,117)	0		X
e_93	Other recreational items and equipment, gardens and pets	0,854 (0,026)	0	X	
e_94	Recreational and cultural services	0,811 (0,017)	0	X	
e_95	Newspapers, books and stationery	0,789 (0,018)	0	X	
e_96	Package holidays	1,112 (0,059)	0		X
e_101	Pre-primary and primary education	1,241 (0,177)	0		X
e_102	Secondary education	1,643 (0,193)	0		X
e_103	Post-secondary non-tertiary education	0,744 (0,286)	0,01		X
e_104	Tertiary education	2,633 (0,150)	0		X
e_105	Education not definable by level	1,298 (0,105)	0		X
e_111	Catering services	1,102 (0,012)	0		X
e_112	Accommodation services	1,733 (0,079)	0		X
e_121	Personal care	0,750 (0,011)	0	X	
e_122	Prostitution	1,013 (0,031)	0		X
e_123	Personal effects n.e.c.	0,438 (0,144)	0,002	X	
e_124	Social protection	0,648 (0,010)	0	X	
e_125	Insurance	0,583 (0,141)	0	X	
e_126	Financial services n.e.c.	1,031 (0,059)	0		X
e_127	Other services n.e.c.	0,663 (0,075)	0	X	
e_128	Remittances to household members not resident in the dwelling	1,027 (0,248)	0		X

Source: Own elaboration

From this table, it can be seen that 29 items can be considered as necessary goods. These goods can be broken down into 4 categories: the first category refers to those items which are devoted to meet physiological needs (food, clothing, beverages, etc),

the second category includes housing related items (electricity, gas, heating, household repairing, etc), the third category includes a broad range of services items from medical services (medicine, pharmaceutical products, paramedic products, etc) to financial and insurance ones. The last category includes cultural and leisure items (electronic equipment, magazines, journals, pets, etc)[11].

Our next step, before moving to the estimation of the necessary consumption function for the Spanish households, was to compute the total amount of expenditure in necessary goods, $x_i = \{1,...,n \in m\}$, for each household, j. Mathematically speaking, the total amount of necessary consumption for each household is given by the following expression:

$$NC_j = \sum_{i=1}^{29} x_{ij} \text{ para } \forall j = 1,\ldots,19425 \text{ and } \forall n = 1,...,29 \quad [12] \qquad (43)$$

4.2.2. Necessary consumption function: An estimation for the 2006 Spanish Household Budget Survey

This subsection estimates a necessary consumption function for the Spanish households based on the sample of the 2006 SHBS and on the identification and computation of necessary consumption carried out in the previous section. In order to do so, we regress total expenditure in necessary goods for each household (NC_j) against household income (y_j) and a variable which takes into consideration household size (hs_j). The inclusion of the variable hs_j is necessary in order to reflect adequately those

[11] Although good "Narcotis" is identified as a necessary good, it should be removed from the calculation because it is not statistically significant.

[12] Data on these computations are not shown in this paper but the authors are very willing to provide them upon request.

externalities and savings arising from the consumption of certain household goods and services (gas, electricity, etc) which are subject to scale economies. hs_j is going to be modeled based on the household equivalent size of the OECD scale[13] using the following expression:

$$hs_j = 1 + 0,7 * (NMIEM6 - 1) + 0,5 * NMIEM5 \quad (44)$$

where NMIEM5 represents the number of household members under 18 years of age whereas NMIEM6 represents the number of household members aged 18 or above. Both variables are included in the 2006 SHBS.

Therefore, taking into account the above considerations, the necessary consumption regression to be estimated is the following one:

$$NC_j(y_j, hs_j) = \gamma_0 + \gamma_1 y_j + \gamma_2 hs_j + \xi \quad (45)$$

Expression 45 is estimated with data from the 2006 SHBS. Regarding the total number of observations (households) contained in the survey (19,425) we establish a cut-off considering only those households with total expenditures in necessary goods equal or above 5,000 euros. This leaves us with a sample size of 17,320 households.

The results of estimating equation 45 can be seen in Table 2.

[13] The OECD scale keeps the same weights but changes the cut-off age from 18 to 14.

Table 2: Necessary consumption, income and household size (SHBS, 2006)

Dep. Variable	NC_j
Regress.	
Constant	1718.20
	(115.27)
y_j	0.36**
	(0.00)
hs_j	1546.69
	(57.77)
Est.	OLS
R2	0.67
J-Statistic	
Prob (F-statistic)	0.00
N.obs.	17.320

Note: Table displays coefficients and Huber-White heterocedasticity robust standard errors in parenthesis,
** indicates coefficient significant at 0.05 level ,
Source: Authors´ Elaboration based on SHBS, 2006

It can be seen that the income coefficient γ_1 is positive and statically significant and its value is lower than one. Therefore, this result tells us that necessary consumption increases at a decreasing rate as income rises. This is in line with the common understanding about the patterns of households' behavior regarding to the consumption of necessary goods embedded in the microeconomic theory. The hs_j coefficient γ_2 is also positive showing that an increase in the household size is accompanied by an increasing in the consumption of necessary goods. Finally, approximately 67% of the total variation in expenditure in necessary goods is explained by our regression[14].

4.3. $SPIT_{2006}$ vs DITM: an comparative analysis in terms of progressivity and social welfare

[14] We have used other alternative specifications for estimating the necessary consumption function in accordance with the literature of consumer behavior (Houthakker and Taylor (1970), Deaton and Muellbauer (1980); Banks et al (1997) and more recently Schamin and Ahmad (2006), Lawbel and Pendakur (2009) and Tafere et al (2010)). The estimations using this alternative approaches have shown similar results.

In this subsection we demonstrate that our tax method proposal (DITM) is more progressive and social welfare enhancing than the 2006 Spanish Personal Income Tax (SPIT)[15]. The comparison is focused on the progressive part of the 2006 SPIT since our goal is to demonstrate that it is possible to get greater after-tax welfare gains by means of flat rates under our proposal.

Following the theoretical results, we define $y \in [a, m]$ as the total income corresponding with the general income[16] under both tax methods (see Figure 2 and 3), being *a* the lowest income level, which we will associated with personal allowances in the 2006 SPIT, and *m* the highest income level.

The first step is to demonstrate that our proposal (DITM) is more progressive than the 2006 SPIT. Let us denote TL_{SPIT} (see Figure 3) and TL_{DITM} (see Figure 2) as the tax liabilities for the 2006 SPIT and DITM, respectively[17]:

$$TL_{SPIT} = t(y)[y - PA] \tag{46}$$

where *y* is the total income corresponding with the general income with $y \in [PA, m]$; *PA* is the personal allowances in the 2006 SPIT (strict minimum of nontaxable income equal for all taxpayers) which take into consideration the household size (based on the number of descendants under 25 years old) and *t(y)* is the progressive rate

[15] For easy of notation we have removed the year through our theoretical demonstration.

[16] In the sample of taxpayers of IEF (2006), y corresponds with the variable called PAR476. Moreover, we only consider values of income above the personal allowances (in Spain is called personal minimum and the amount in 2006 was equal to 3,400 €). After this, the sample was reduced to 604,453 observations. We will apply this condition to both tax methods (SPIT and DITM).

[17] As it can be seen in Figure 3, we must subtract, before applying the tax schedule (progressive rate), not only the personal allowances but the reductions of the general income. For the sake of simplicity we remove these reductions in the theoretical part. However, we have taken into account this issue for the empirical results in both tax methods.

$$TL_{DITM} = t_d \left[y - NC(y, hs) \right] \tag{47}$$

where *y* is the total income corresponding with the general income (see Figure 1) with $y \in [PA, m]$; *NC(y, hs)* is the necessary consumption (as we defined in section 2)[18]; *DY* (discretionary income) is the aggregate of discretionary income which is the sum of incomes exceeding NC(y, hs) for the whole set of taxpayers and t_d is the flat rate on discretionary income.

Taking into account that the total tax revenues must be the same (see Equation 14) and that a tax method A is more progressive than a tax method B if the variation on the average tax rate of tax method A is greater than tax method B (see section 3.1), we can compare the progressivity of SPIT and DITM by deriving the average tax under both tax methods in Equation 20, being t_i each marginal tax rate in the schedule.

$$\frac{tma_{SPIT}}{tme_{DITM}} = \frac{t_i}{tme_{DITM}} < 1 \qquad \forall i = 1, ..., 5 \tag{48}$$

[18] In order to calculate this variable, we use the estimation of NC (Table 2). One of the advantages of using individual income tax forms is that it is possible to measure the effect of household size over each taxpayer. According to equation 9, we identify NMIEMB5 with the number of descendants of each taxpayer under 25 years old (in order to homogenize the results with the 2006 SPIT) using the information in the sample of taxpayers of IEF. In the case of NMIEMB6 (related to number of adults in the family), we only consider the existence of a spouse. For doing this, we use the variable called ESTCV with value 2 in the sample of taxpayers (IEF), taking NMIEMB6 the value 2 if the taxpayers is married or 1, otherwise. The possible reductions for the existence of other adult members in the households (as parents) are part of the General Tax Reductions (independently of the personal allowances) in the tax and are applied separately (see Figure 1). For this reason, and in order to standardize the comparison SPIT-DITM, NC is only going to take into account the existence of spouse and descendants according to the OECD model. Deductions for these and other reasons are subsequently applied to the same amount that the income tax (2006 SPIT), although we have removed it from the theoretical assessment.

SPIT has a tax schedule comprising five tranches: t1=15%, t2=24%, t3=28%, t4=37% y t5=45%. The empirical results show that average rate tax under DITM is 0.3987. Substituting the resulting values of the empirical estimation, it becomes clear that this would not be fulfilled in the case of the highest incomes (those incomes in the upper part of the progressive scale, i.e., in the 2006 SPIT incomes equal or more than 46,818 euros)[19]. Therefore, we have proved that our proposal is more progressive than the 2006 SPIT in all the income brackets, except the last one[20]. Taking into account that equation 23 is fulfilled for all income levels, except a small share of very high incomes, and considering other important advantages implied by the use of flat rates (such as simplicity and disincentives link to jumps on tax scale and, above all, the great value that personal allowances have in our proposal in terms of real priorities of taxpayers' consumption, our tax method proposal can be considered superior than the 2006 SPIT.

Our second step is to demonstrate that our proposal (DITM) is social welfare enhancing in comparison with the 2006 SPIT). In order to apply Atkinson's theorem (1970) and following the theoretical perspective followed in section 3.2, the after-tax income distribution under our tax method proposal is more equal than the after-tax income distribution under the 2006 SPIT when the following condition is satisfied (having the two distributions the same mean since we fulfill the condition in Equation 14):

$$\int_a^m U(y - TL_{SPIT}).f(y)dy \leq \int_a^m U(y - TL_{DITM}).f(y)dy \qquad (49)$$

[19] For example, let consider one taxpayer who earns 60,000 euros. The tax rate of 45% is applied only on 13,182 euros (60,000- 46,818) of his total income, which represents only 21% of his total income. (See Law of the SPIT in 2006 'Texto Refundido de la Ley del Impuesto sobre la Renta de las Personas Físicas, aprobado por el Real Decreto Legislativo 3/2004, de 5 de marzo (B.O.E. de 10 de marzo).

[20] A future extension of this paper to achieve more progressivity in all the income brackets would be introduce a higher tax rate for the top of incomes, i.e., a tax method which combining two flat rates: a general one and another one for the highest incomes.

For our empirical perspective, we consider the Spanish case using the micro-data from the 2006 Spanish Household Budget Survey and the corresponding Sample of Taxpayers from the Spanish Institute for Fiscal Studies.

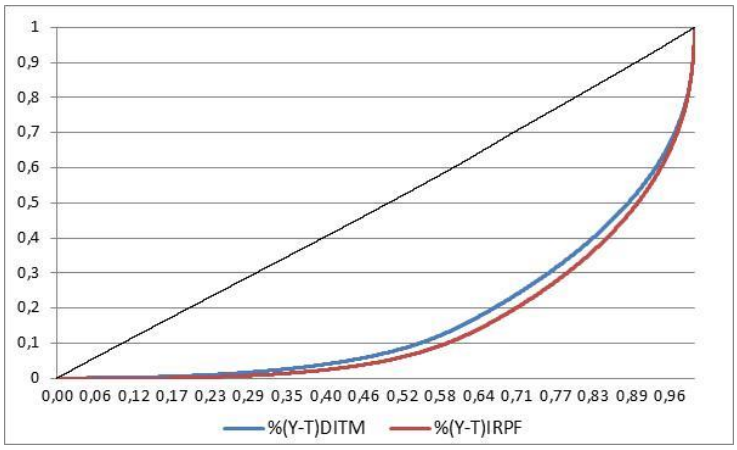
The previous theoretical condition explained in section 3.2 can be applied to the 2006 SPIT and therefore evaluated in terms of social welfare with our proposal, DITM. In terms of the criterion of Lorenz dominance, we prove that our proposal is preferred than the 2006 SPIT since the DITM distribution is closer to the equal distribution (bisector), taking into account that both distributions have the same mean (equal tax revenues), since the following condition holds true:

$$\alpha_{(y-TL)SPIT}\,\rho(y) \leq \alpha_{(y-TL)DITM}\,\rho(y) \tag{50}$$

where $\alpha_{(y-TL)SPIT}$ represents the cumulative shares of after-tax incomes under the 2006 SPIT, $\alpha_{(y-TL)DITM}$ the corresponding one under the DITM and $\rho(y)$ the cumulative shares of taxpayers ordered by their income levels.

Figure 4 plots the Lorenz curves corresponding to the 2006 Spanish Personal Income Tax (SPIT) and our alternative tax method proposal (DITM). It can be easily seen that the Lorenz curve under our tax method (DITM) is clearly above the one corresponding to 2006 SPIT.

Figure 4. Lorenz curves: SPIT vs DITM



Source: Own elaboration using micro-data from the Sample of Taxpayers of IEF (2006) and the SHBS (2006)

Based on the fact that the after-tax income distribution in our tax method proposal is closer to the bisector, a fairer after-tax income distribution of income adjusted for household size is achieved.

5. Conclusions

In this paper we have compare the traditional scheme of personal income taxes (with progressive tax schedules and fixed personal allowances) embedded in most developed countries with our alternative proposal, a tax method we refer to as Discretionary Income Tax Method (DITM). The key building blocks of our tax method are: a) a scheme of deductions from the tax base (discretionary income) based on increasing personal allowances (IPAs) which are modeled resorting to the concept of necessary consumption and b) a flat rate equal for all taxpayers.

The implications of our approach to IPAs by necessary consumption and therefore discretionary income as our measure of ability to pay jointly with the use of a flat rate as opposed to the structure of the traditional personal income tax methods which is based on a strict minimum of nontaxable income equal for all taxpayers and a complex mix of

a progressive schedule and flat rate (equity earnings) are twofold. On the one hand, we have theoretically demonstrated that our tax method proposal (DITM) is more progressive and social welfare enhancing than the TPIT methods. On the other hand, we have carried out a thorough empirical exercise from the Spanish personal income tax in order to check for the verification of our theoretical results. Using the micro-data from the 2006 Spanish Household Budget Survey and the corresponding Sample of Taxpayers from the Spanish Institute for Fiscal Studies (IEF), the results obtained comparing the 2006 SPIT and the DITM are in line with the theoretical predictions. We have demonstrated that our tax method leads to a more progressive personal income tax and it is more social welfare enhancing than the 2006 SPIT.

The most important contribution of our paper is that our alternative scheme proposed may represent an option for some countries where traditional scheme is already sold. Other countries (for instance, the ones from Eastern Europe) which have used flat rate schemes could see our tax proposal as an alternative method operationally relevant. In this sense, there are two main positive implications. First, our proposal creates fiscal illusion based on the fact that it would seem that households with more income levels would be paying a lower proportion of taxes (therefore, diminishing their labor disincentives and fiscal evasion for paying taxes) than those with fewer resources since all taxpayers pay the same flat rate but those with higher income have more personal allowances (IPAs). However, in fact, it occurs the opposite due to the key element in our tax method are the relative shares of necessary consumption over total income which decrease as income rises. Second, our proposal becomes an automatic mechanism of economic stabilization since households will modify their consumption patterns in necessary goods (IPAs) in line with the business cycle so the fiscal allowances would be relatively higher or lower in each phase of the cycle.

Finally, from a fiscal policy point of view, our tax method proposal is simpler. It avoids the complexities of assigning a different tax rate for each income bracket in the tax schedule. Moreover, the current econometric techniques are very sophisticated and allow us to compute the necessary consumption function (as it has been shown) quite easily to be incorporated into the fiscal system as IPAs. Therefore, we are able to achieve tax progressivity through IPAs in the tax base using a scheme of flat rate taxes. Since this implies much less administrative and managerial costs, governments and fiscal policy authorities should bear in mind these positive elements in designing future personal income tax systems. Nevertheless, it is also important to bear in mind that there are also some limitations[21]. On the one hand, the implementation costs or some others potential problems of practical application/implementation; among others, the absence, confidence or deficiency of the databases, weak legislation, widespread informality, etc. On the other hand, possible changes in the household consumption behavior and their effects on IPAs and therefore on the business cycle as well as on fiscal evasion should be analyzed in order to check the benefits mentioned above.

A very promising research avenue along the lines proposed in this paper would be to compare our tax method proposal with the current personal income tax systems in other countries.

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[21] We thank a referee for raising this point.

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Annex

Table A: Number of detailed COICOP/HIPC 2007 positions

COICOP	Label	EU25 weights	Position at 5th level	Position at 6th level
01	Food and non-alcoholic beverages	152	**54**	**77**
02	Alcoholic beverages, tobacco	44	**13**	**13**
03	Clothing and footwear	71	**20**	**36**
04	Housing, water, electricity, gast and other fuels	145	**18**	**28**
05	Furnishings, household equipment and routine maintenance of the house	75	**39**	**77**
06	Health	37	**15**	**0**
07	Transport	149	**25**	**41**
08	Communication	29	**8**	**18**
09	Recreation and culture	104	**45**	**127**
10	Education	11	**5**	**11**
11	Restaurants and hotels	99	**11**	**24**
12	Miscellaneous goods and services	85	**25**	**42**
Total		1000	**278**	**494**
Cumulative total (rounded)		127*	**405**	**899**

*Cumulative total for first four levels

Source: Zoppe, A. (2007). Use of COICOP in the European Union (Eurostat). Meeting of the Expert Groups International Economic and Social Classifications, 16-18 April, 2007, NY. United Nations, Department of Economic and Social Affairs Statistics Division. ESA/STAT/AC. 124/27 and SNA News, nº 24- Data from 2004 (2007).