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Optimal Diversity and Redistributive Preferences: IRPF and the Autonomous Communities[1]

Differences in the distribution of the richest taxpayers between Autonomous Communities make it optimal to apply different top marginal tax rates between them in personal income tax.

Decentralization of spending, but also of revenue

Compared to the centralized and uniform provision of public goods and services, fiscal decentralization allows the provision to be adapted to the needs and preferences of each jurisdiction. Therefore, if the territory is diverse, decentralization will promote welfare gains, in particular by improving the efficiency of allocating public resources. In the literature, this straightforward but powerful argument is called "decentralization theorem" (Oates, 1977) and advocates for the decentralization of expenditure[2]. *Diversity* is key for these gains in provision to exist.

An indirect consequence of this argument is that the decentralization of spending should also entail the decentralization of revenue to ensure a good accountability process (Olson, 1969)[3], that is, that politicians and citizens are aware of the financial cost of their decisions/demands for public spending. In this short text, we will focus precisely on this second aspect of decentralization. Regarding this, at least in Spain, the disadvantages derived from harmful tax competition are often emphasized, while the supposed gains derived from fiscal co-responsibility tend to be, let's say, despised. In this case, we are not going to focus our analysis on that supposed trade-off (harmful tax competition *vs.* fiscal co-responsibility), but we are going to put on the table and analyse another potential positive effect of income decentralization, which could even serve to complement the territorial debate in Spain.

The additional positive effect is based on the so-called theory of optimal taxation. That is, what are the optimal rates on personal income where the optimality is derived from obtaining a *certain* redistribution subject to the fact that the distortion posed by the marginal rates does not generate *excessive* efficiency losses? The adjective "certain" depends on the redistributive preferences of the territory where the tax is applied, while the efficiency losses will depend on how reactive individuals are to the tax. From these parameters, and another key that we will see later, Saez (2001) obtained analytically what the optimal marginal tax rate should be by income level. We are going to apply this model to the territorial diversity of Spain.

Characterization of marginal rates on income: what do they depend on?

Saez's model represented a revolution in public economics at the beginning of the century. Based on very few theoretical parameters and assumptions, it was possible to characterize the *shape* of the tax function, that is, the marginal rates by income levels. In our case, we will not focus on characterizing the entire function, but rather on a paradigmatic element of the tax: the top optimal marginal tax rate. This is an element that is often used, for example, to compare personal income tax between countries, as well as between Autonomous Communities (AC). Starting from this theoretical framework, the question that we are going to ask ourselves is simple: does this optimum differ between Autonomous Communities (including regional ones)[4]? If the answer is affirmative[5], and we will see that it is, we will have identified an additional aspect to favour the decentralization of revenue in Spain.

The formula that determines the optimal marginal tax rate applied in the last bracket of the schedule, t^*, is the following:

$$t^* = \frac{1-g}{1-g+a\varepsilon}$$

g measures the intensity of redistributive preferences, ranging from zero (maximum intensity) to one (minimum). It is a ratio that has a very simple interpretation: it relates in relative terms (hence it is between 0 and 1), the social value of an additional unit of income in the hands of individuals

1 The content of this Info-IEB is based on an article published in Investigaciones Regionales, which can be accessed at https://investigacionesregionales.org/es/article/imposicion-optima-y-descentralizacion-fiscal-el-caso-del-irpf/

2 For Spain, see the study by Goodspeed (1994), who estimates, with a theoretical and numerically simulated model, the welfare gains derived from decentralization; as well as Espasa et al. (2017), who carry out an empirical analysis for three public services: health, education and the administration of the justice administration.

3 See also http://www1.worldbank.org/publicsector/decentralization/fiscal.htm

4 Klemm et al. (2018) have applied this idea, but to compare between countries.

5 Cubel and Shorrocks (2002) propose a similar analysis, but which is based on identifying conditions that determine when there are improvements in wellbeing in a AC produced by the differentiation of its income tax (under different configurations) with respect to the centralized one. Such an analysis, therefore, does not determine what is the optimal rate, or the optimal rate on income.

located in the upper bracket *versus* that additional unit of income going to the coffers of the public sector. Therefore, it does not make sense that it is greater than 1, which would give rise to negative rates, while the situation in which g=0 implies that the only objective of the public sector is to maximize the income of that group of taxpayers[6]. In addition to g, which captures the equity component (the smaller g is, the greater t^* is), in the denominator we have the elasticity of the response of the base to the marginal rate, and which therefore includes the concept of efficiency. Specifically, it informs us about the percentage of the tax base when the net marginal rate ($1-t^*$) varies by, say, 10%; hence the elasticity appears with a positive[7] sign. Being in the denominator, as expected, it assumes that the higher this elasticity, the lower the optimal marginal rate.

Now, elasticity interacts with an additional key parameter, a, the so-called "Pareto coefficient". This parameter has a statistical nature related specifically to the distribution of taxpayers in the upper tail of income, which is the one that interests us, and which usually takes a Pareto shape (we will return to this further on). The lower (higher) the value of the "Pareto coefficient", the higher (lower) the proportion of income available to the high percentiles of the distribution. Consequently, given an efficiency cost, the more socially "productive" it will be to increase the marginal rate the lower a is.

In short, to characterize the top optimal marginal tax rate we need to have information on three statistics: g, a and ε.

Autonomous communities and top optimal marginal tax rates on income: is there diversity?

6 That is, it does not assign any social value to the fact that income above the upper bracket is in the hands of taxpayers. In the literature, this situation is called "soaking the rich".

7 For example, when the variation of the base is above 10%, the elasticity is greater than 1, and we are in the descending part of the famous "Laffer curve", which indicates that the rate is too high.

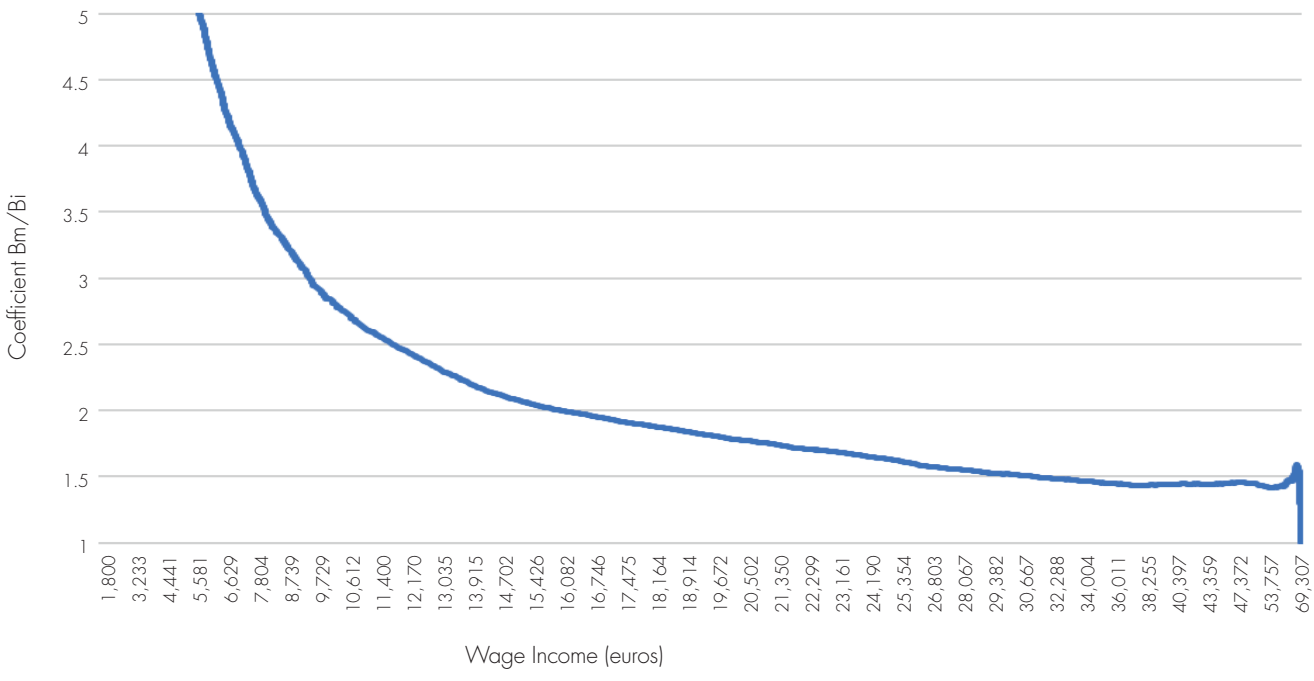
According to the theory of optimal taxation, the highest marginal rate that would apply to the richest taxpayers would be 66% in the AC of Madrid, and the lowest in Castile and León, 52%.

To carry out our exercise, we are going to assume that the elasticity is the same throughout the national territory, and that it is situated, according to the existing empirical literature, in the range 0.1 to 0.3. Certainly, between Autonomous Communities, it may also differ, but since the definition of the tax base is the same, as well as the fact that the tax is administered by the AEAT (Spanish Tax Agency), this does not seem like a crazy assumption[8]. What can vary, and in fact does, is the Pareto coefficient between Autonomous Communities. As we have said before, this has a statistical nature, so that it is the data themselves that can inform us about the difference between Autonomous Communities in the distribution of income in the upper tail. Consequently, there is no assumption to make here.

If there is a Pareto distribution of income in the upper tail, starting from a certain income level, the ratio between income at a certain point and the mean above that point converges to $a/(a-1)$. Therefore, the existence of this statistical regularity would confirm the Pareto shape of the distribution in the upper tail. Furthermore, it would allow us to estimate precisely the Pareto coefficient that we need to calculate the optimal rate, given an elasticity and a value of g. For the moment, we will assume that this last pa-

8 For example, the aforementioned study by Klemm et al. (2018) also uses the same elasticity to obtain top optimal marginal tax rates by country.

Ratio of mean wage income above a certain threshold (*Bm*) between this same threshold (*Bi*) throughout the entire distribution, for Spain in 2018



All the Autonomous Communities increased their marginal tax rate, and thus approached its optimum, except for four ACs that maintained it or lowered it (Madrid, Castile and León, Castile-La Mancha and Galicia)

rameter is equal to zero. The important thing, remember, is to infer whether there are differences between Autonomous Communities, which will be given by *a*. If, in addition, there are differences in redistributive intensity or elasticity, this is more in favour of the argument for *optimal* diversity. In the graph below, we show the results of the exercise for the national total based on the microdata on labour income from the INE's 2018 Survey of Living Conditions, which refers to data from 2017. From this, we conclude that the aforementioned statistical regularity occurs such that the "Pareto coefficient" is approximately 3; however, if we carry out this exercise at the AC level, we obtain a minimum of 2.53 for the AC of Madrid and a maximum of 4.54 for Castile and León. Therefore, *ceteris paribus*, the maximum (minimum) of the top optimal marginal tax rate is that of the AC of Madrid (Castile and León). This is shown in Table 1.

Specifically, the table gives results for various values of elasticity. The higher the (common) value of elasticity, the greater the optimal diversity, since we remember that the value of *a* (single source of diversity) is interacting precisely with the value of elasticity. For $\varepsilon = 0.2$, the top rate of the AC of Madrid is 66%, and that of Castile and León is "only" 52%. Beyond the *optimal* diversity, the subject of this text, note the differences with reality (identified by the sum of the regional marginal tax rate plus the state tax rate) that each AC applied in 2017. The maximum divergence occurs precisely in the AC of Madrid, 23 percentage points (pp)[9], and the minimum divergence occurs in Navarre, 2 pp. In practice, in 2017, with respect to the uniform situation (non-exercise of the autonomous regulatory capacity), all the Autonomous Communities increased their marginal tax rate, and thus approached its *optimum*, except for four ACs that maintained it or lowered it (AC of Madrid, Castile and León, Castile-La Mancha and Galicia). That is, apart from the existence of diversity (in favour of decentralization), in general, the Autonomous Communities have used it in the "correct" direction.

Autonomous Communities and redistributive preferences: is there diversity?

We have just said that the Autonomous Communities have gone in the "correct" direction. By correct we mean towards the *optimum*. This, we know, depends on structural factors such as the distribution of taxpayers in the upper tail (which differs) and their reaction to changes in marginal tax rates (which we assume does not differ; see note 8), but also on the collected redistributive preferences for *g*. That is why we cannot be entirely sure that the optimal marginal rates calculated are those shown in Table 1. Again, this does not

9 One option is that the elasticity of the AC of Madrid is different from the one we are considering here, 0.2. This being the case, we can ask ourselves what the elasticity of this AC would be so that its (total) tax rate for 2017 was optimal. If we assume that $g = 0$, which we will return to later, its elasticity should be 0.51. However, for example, if $g = 0.25$, its elasticity should be 0.39. In principle, according to the existing empirical evidence, such elasticities would be above, at least, what is expected.

Table 1. Top optimal marginal tax rates (MTR) by AC (g=0)

	Pareto Coef.	optimal MTR (e=0.1)	optimal MTR (e=0.2)	optimal MTR (e=0.3)	real MTR	Real discrepancy vs. e=0.2 (p.p.)	Average Salary (euros)
AC of Madrid	2.53	80%	66%	57%	43.50%	23	26,389
Balearic Islands	2.83	78%	64%	54%	47.50%	16	23,191
Catalonia	2.92	77%	63%	53%	48.00%	15	24,603
Basque Country	3.19	76%	61%	51%	49.00%	12	27,236
La Rioja	3.4	75%	60%	50%	48.00%	12	21,079
C. Valencia	3.68	73%	58%	48%	48.00%	10	19,740
Extremadura	3.72	73%	57%	47%	47.50%	10	17,506
Castile-La Mancha	3.72	73%	57%	47%	45.00%	12	18,785
Andalusia	3.74	73%	57%	47%	48.00%	9	20,151
Canary Islands	3.85	72%	56%	46%	46.50%	10	18,112
Aragon	4.15	71%	55%	45%	47.50%	7	22,338
Asturias	4.19	70%	54%	44%	48.00%	6	21,092
Navarre	4.2	70%	54%	44%	52.00%	2	24,259
Cantabria	4.23	70%	54%	44%	48.00%	6	20,439
Galicia	4.28	70%	54%	44%	45.00%	9	22,183
Murcia	4.33	70%	54%	43%	46.00%	8	19,167
Castile and León	4.54	69%	52%	42%	44.00%	8	21,962
Max-Min		1.16	1.27	1.34	1.20	9.75	1.56
D. E.		0.032	0.040	0.042	0.020	4.66	2,789
Average		73%	57%	47%	47%	10	22,594

Table 2.Implicit Redistributive Preferences based on Real Marginal Rates

	Marginal utility (UMg) of the income of the richest vs social UMg of public income (g)	Relative weight of the richest (in relation to the weight in Navarre)
Navarre	0.090	1.000
Cantabria	0.219	2.433
Asturias	0.226	2.511
Aragon	0.249	2.767
Murcia	0.262	2.911
Castile and León	0.287	3.189
Galicia	0.300	3.333
Andalusia	0.310	3.444
C. Valencia	0.321	3.567
Extremadura	0.327	3.633
Canary Islands	0.331	3.678
La Rioja	0.372	4.133
Basque Country	0.387	4.300
Castile-La Mancha	0.391	4.344
Catalonia	0.461	5.122
Balearic Islands	0.488	5.422
AC of Madrid	0.610	6.778

When tax rates are set, the implicit weight of the richest in the AC of Madrid is almost 7 times the weight given to them in Navarre

invalidate our exercise, whose objective is, under a *ceteris paribus* context, to determine whether the differentiation of rates between ACs is *optimal*, which, by definition, cannot be reached with a centralized tax policy.

In accordance with what was said in the previous paragraph, in Table 2, we present a new exercise that, based on the existing territorial differentiation and Saez's theoretical model, allows us to infer the intensity of the implicit redistributive preferences of each AC. To do this, we are going to assume, again, that the elasticity is equal to 0.2, but we are now going to take the real tax rates of each territory as the optimal ones. This will allow us to obtain the *g* of each territory (it is the only unknown in the formula for the optimal marginal tax rate shown above). Given that the real top marginal tax rate for Navarre is applied from 300,000 euros, this group of taxpayers are the ones we take as a reference. In Navarre, the *g* thus calculated is 0.09, a very low value, close to its minimum and, therefore, in line with a very low relative social assessment of the well-being of the wealthiest. Quite the opposite of what happens in the AC of Madrid, where $g = 0.69$.

This means that, if we take the case of Navarre, where the marginal rate is applied from 300,000 euros, the weight that is given in the AC of Madrid to the wealthiest (> 300,000 euros) is 6.8 (0.61:0.09) times the importance that is given to the wealthiest in the AC of Navarre. This is another advantage of tax "experimentation" at the sub-central level: it allows us to determine the diversity of redistributive preferences between territories. And this exists too. Spain is a very diverse country.

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