Optimal Progressivity of Personal Income Tax: A General Equilibrium Evaluation for Spain

DARÍO SERRANO-PUENTE

Is the Spanish economy positioned at its optimal progressivity level in personal income tax? This article quantifies the aggregate, distributional, and welfare consequences of moving toward such an optimal level. A heterogeneous households general equilibrium model featuring both life cycle and dynastic elements is calibrated to replicate some characteristics of the Spanish economy and used to evaluate potential reforms of the tax system. The findings suggest that increasing progressivity would be optimal, even though it would involve an efficiency loss. The optimal reform of the tax schedule would reduce wealth and income inequality at the cost of negative effects on capital, labor, and output. Finally, these theoretical results are evaluated using tax microdata and describe a current scenario where the income-top households typically face suboptimal effective average tax rates.

Many modern governments implement a redistributive fiscal policy, where personal income is taxed at an increasingly higher rate, while transfers tend to target the poorest households. The taxation of personal income is not a minor issue, since most of the OECD economies obtain a large proportion of their tax collection through it.[1] Raising taxes on higher incomes may be potentially justified by the increase in income and wealth inequality in recent years in Spain, especially after the 2007 crisis, as documented by Angel et al. (2018). Beforehand, one is likely to consider that raising taxes on the income-rich households could reverse the growing concentration at the top. However, this type of policy could be very costly in terms of efficiency in advanced market economies. For that reason, the optimal design of a redistributive tax system is subject to many constraints, as argued by Bakis et al. (2015). This is why having a quantitative theory that accounts accurately for the observed income and wealth inequality is crucial when assessing the aggregate, distributional, and welfare implications of certain policies. For that purpose, a heterogeneous households general equilibrium model is here calibrated to replicate some characteristics of the Spanish economy and used to compare the steady-state consequences of setting an optimal progressivity level in the Spanish personal income tax. This frames the setup here presented in literature of general equilibrium models with heterogeneous agents to explore the relationship between fiscal policy variables and the endogenous cross-sectional distribution of income and wealth in Spain. Examples of this body of literature are Pijoan-Mas and González-Torrabadella (2006), Díaz-Giménez and Pijoan-Mas (2019), and Guner et al. (2020), among others.

The theoretical framework of this paper is built for Spain following Castañeda et al. (2003). The model is devoted to (i) account for income and wealth inequality and (ii) study decisions of households that face labor income processes that are random, household-specific, and uninsurable. In these model-based economies, households accumulate wealth in part to smooth their consumption. Heterogeneity is introduced in this setup via distinct labor market opportunities using an uninsurable process on the endowment of efficiency labor units that features non-linear dynamics. Given the labor market opportunity, the households choose their work effort. In other words, the labor choice is set here to be endogenous. Life cycle characteristics are modeled using aging and retirement and dynastic links are modeled in a way that households are altruistic toward their descendants (hybrid model with retirement and bequests). Household face a progressive tax schedule modeled through the Heathcote et al. (2017) specification, a function that allows for assessing average level of taxes and progressivity separately. The model is properly calibrated to match some empirical statistics of the Spanish economy and replicates the distributions of income and wealth in very much detail (also at the very top tails of those distributions).

---

[1] The OECD average of the share of personal income tax revenues over total tax revenues (excluding social security contributions) has been around 30-35% in recent years.

Once the theoretical framework is defined, a bunch of potential progressivity reforms are assessed through the calculation of many different general equilibria (one equilibrium for each degree of progressivity evaluated). Then a Benthamite social planner, who takes into account all households in the economy by putting the same weight on each of them, discerns the optimal progressivity reform that leaves the aggregate tax burden and transfers-to-output levels unchanged. The findings suggest that aggregate social welfare is maximized when the level of progressivity of the Spanish personal income tax is increased to some extent. More precisely, in the optimally reformed scenario (setting the optimal level of progressivity), welfare gains are equivalent to an average increase of 3.08% of consumption.

By decomposing the aggregate welfare change, it is shown that most of the welfare gains are obtained from a majority of households facing a lower tax rate, i.e. the poorest households facing lower effective income tax rates and richest households affronting higher effective income tax rates. On the contrary, the general equilibrium effects of the optimal reformed economy (higher interest rate and lower wage) and the effects resulting from changes in the equilibrium distribution of households across income levels (larger mass of households at lower income levels) show a welfare loss, but these losses are so small that together cannot overpass the welfare gains directly coming from the reformed tax system, jointly resulting in positive aggregate welfare changes. These welfare gains are

decomposed by household type, where it is observed that the poorest working and non-working households are the ones who benefit the most from the reform. Contrarily, the most efficient working households and the wealthiest ones (either working or non-working) are those who experience the largest trade-off between (i) positive welfare effects derived from higher income (due to an increased interest rate that pushes up capital returns) and (ii) adverse effects emerging from higher tax payments (due to the increase in progressivity of the income tax that discourages labor and savings). The losses from this trade-off are particularly high in top parts of the income and wealth distributions and clearly offset the potential welfare gains of the households populating such areas. Therefore, knowing that these agents would be the losers of the reform, despite positive aggregate welfare effects, the consequences on aggregate capital, labor, and output would be negative, which means that the economy would experience an efficiency loss. Moreover, looking at the distributional implications, this reform would reduce income and wealth inequality.

Finally, the theoretical results are evaluated with Spanish tax micro data. From the point of view of a Benthamite social planner, households between the 20th and the 80th percentiles would experience a decrease in their average tax rates under the optimal progressivity reform. For example, the effective average tax rate encountered by a household situated within the 40th and the 60th percentiles of the

Figure 1
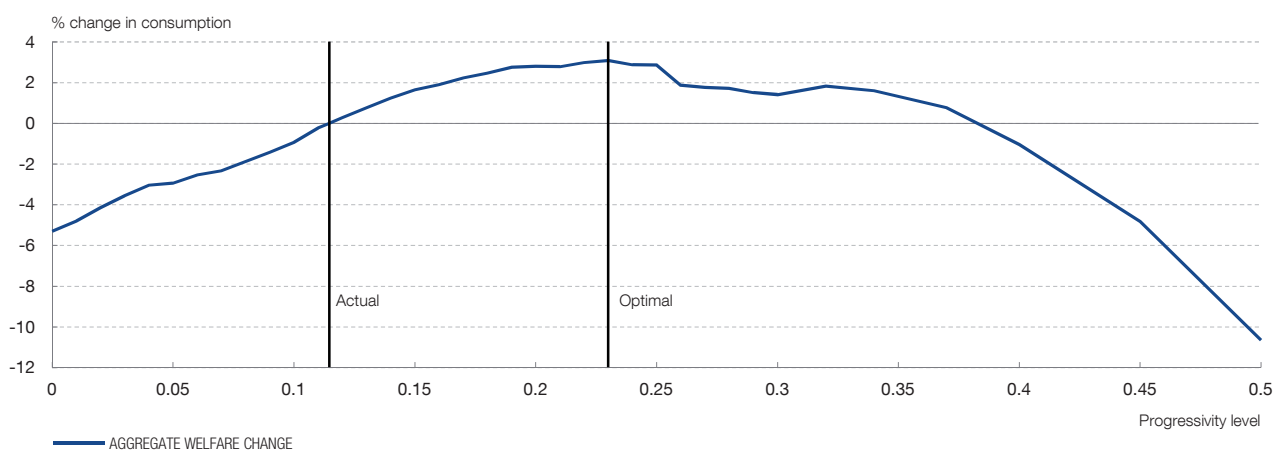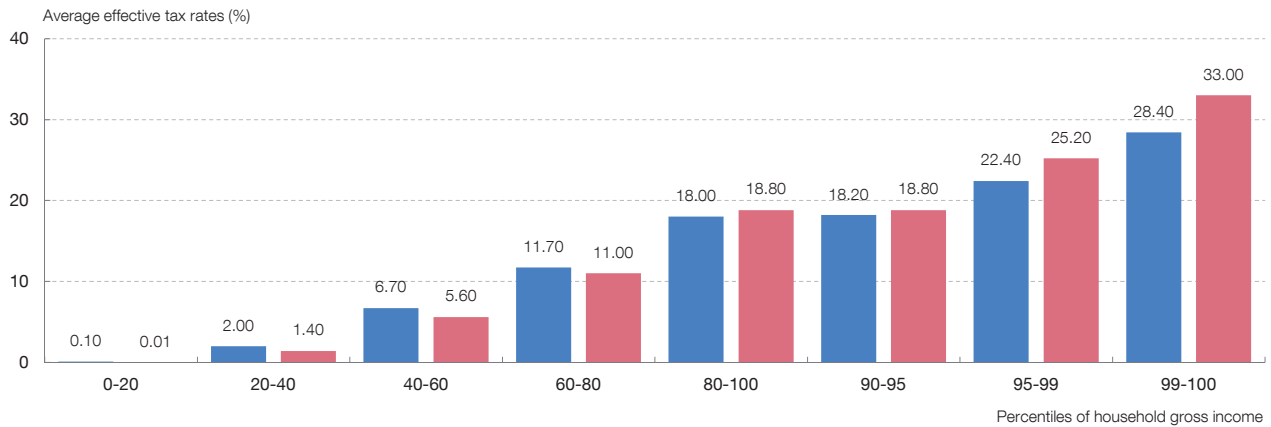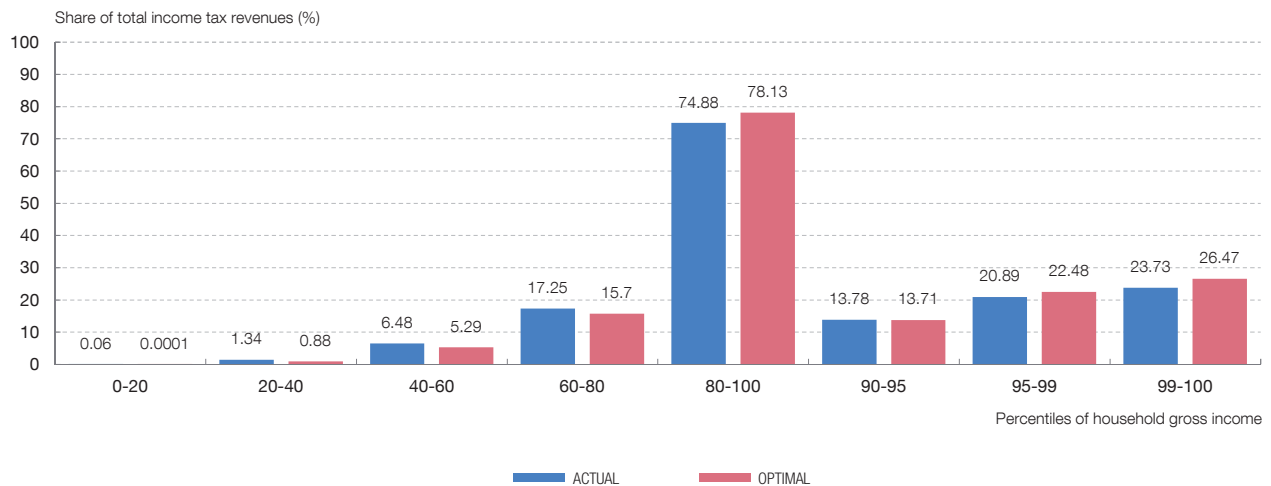**AGGREGATE WELFARE CHANGE**

Figure 2

AVERAGE EFFECTIVE TAX RATES AND SHARE OF TAX REVENUES

1 AVERAGE EFFECTIVE TAX RATES

2 SHARE OF TOTAL INCOME TAX REVENUE

income distribution would drop from 0.067 to 0.056, which involves a change of 1.1 p.p.. On the other hand, households above the 80th percentile would experience a drastic increment in their effective average tax rate. For instance, the top 1% households of the gross income distribution would go from confronting an average tax rate of 0.284 in the actual scenario to dealing with an average tax rate of 0.330 in the optimal one.

In conclusion, as policy implications arising from this study, what the model (jointly with the data) indicates is that, in terms of aggregate welfare, it would be optimal to increase the progressivity of the personal income tax. In addition, the reform would reduce income and wealth inequality. However, this would lead to an efficiency loss of the economy, since it discourages work and savings mainly by penalizing the top-working and wealthiest households.

REFERENCES

Anghel, B., H. Basso, O. Bover, J. M. Casado, L. Hospido, M. Izquierdo, I. A. Kataryniuk, A. Lacuesta, J. M. Montero, and E. Vozmediano (2018): "Income, Consumption and Wealth Inequality in Spain," *SERIEs - Journal of the Spanish Economic Association - Journal of the Spanish Economic Association,* 9, 351–378.

Bakis, O., B. Kaymak, and M. Poschke (2015): "Transitional dynamics and the optimal progressivity of income redistribution," *Review of Economic Dynamics,* 18, 679–693.

Castaneda, A., J. Díaz-Giménez, and J. V. Ríos-Rull (2003): "Accounting for the U.S. Earnings and Wealth Inequality," *Journal of Political Economy,* 111, 818–857.

Díaz-Giménez, J. and J. Pijoan-Mas (2019): "Investment expensing and progressivity in flat-tax reforms," *SERIEs - Journal of the Spanish Economic Association*, 10, 365–399.

Guner, N., J. Lopez-Segovia, and R. Ramos (2020): "Reforming the Individual Income Tax in Spain," *SERIEs - Journal of the Spanish Economic Association,* 11, 369-406.

Heathcote J, Storesletten K, Violante G (2017) "Optimal tax progressivity: an analytical framework," Quarterly Journal of Economics, 132, 1693–1754.

Pijoan-Mas, J. and M. González-Torrabadella (2006): "Flat Tax Reforms: A General Equilibrium Evaluation for Spain," *Investigaciones Económicas,* 30, 317–351.