



## Welfare improving distributionally neutral tax reforms<sup>☆</sup>

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### ABSTRACT

In a new model with incomplete markets, I quantitatively determine tax reforms that are welfare improving, distributionally neutral, and leave the budget balance unchanged in the long run. I consider a new reform. I eliminate capital income taxation and replace it with progressive consumption taxation, consisting of taxing necessities and luxuries at different rates. I compare steady states under various tax regimes. I find that progressive rather than uniform consumption taxation generates higher welfare gains in the long run and during the transition to the steady state. While this type of reform achieves redistribution neutrality only in the long run, it generates welfare gains for the whole population during the transition. These results stay robust when non-homothetic preferences are considered and progressivity in consumption taxation is achieved by subsidizing consumption of the poor. With respect to long term objectives, the choice of a more progressive consumption or labor-income tax system depends on the modelization of preferences. During the transition, a tax reform involving more progressive labor-income taxation generates smaller redistribution effects than any consumption tax reform.

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### 1. Introduction

The US tax system is an outlier amongst OECD countries due to fact that it collects the lowest share of tax revenues raised through consumption taxes (13.9% in 2005 versus 30% for the OECD average). As shown by Hines (2007), there seems to be no clear rationale behind this unusual tax structure. Since Fisher and Fisher (1942), a large number of economists have suggested that the US tax system should be reformed to increase the consumption tax and decrease income taxation. Recent proposals have focused on eliminating capital income taxation and replacing it with a uniform consumption tax.<sup>1</sup> The main argument in favor of this type of reform is to eliminate the large distortions induced by capital income taxation and thereby improve welfare. An essential argument against this type of reform relates to the regressive nature of a uniform consumption tax.

If uniform taxation is usually preferred over progressive taxation because it is less distortive, the recent literature shows that in an incomplete market framework, a progressive income tax system is optimal (Conesa and Krueger, 2006<sup>2</sup>). Building upon this contribution, I propose a new model with incomplete markets. The model reflects

changes in consumption behavior over the life-cycle by combining exogenous no-borrowing constraints and changes in labor productivity. In this framework, I quantitatively determine tax reforms that involve progressive taxation and achieve a triple objective. They are *distributionally neutral, welfare improving, and leave the budget balance unchanged* in the long run. In addition to this new objective, I propose a new type of reform. I replace capital income taxation with *progressive consumption taxation*. Progressive consumption taxation consists of taxing necessities and luxuries at different rates. I compare steady states under various tax regimes. After eliminating capital income taxation, I find that progressive rather than uniform consumption taxation generates higher welfare gains in the long run and during the transition to the steady state. While this type of reform achieves redistribution neutrality only in the long run, it generates welfare gains for the whole population during the transition. These results stay robust when non-homothetic preferences are considered and progressivity in consumption taxation is achieved by subsidizing consumption of the poor. With respect to long term objectives, the choice of a more progressive consumption or labor-income tax system depends on the modelization of preferences. During the transition, a tax reform involving more progressive labor-income taxation generates smaller redistribution effects than any consumption tax reform.

Following Gertler (1997, 1999),<sup>3</sup> I modify the Yaari (1965)–Blanchard (1985) overlapping generations model to make it suitable for studying the redistributive effects of tax reforms between

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<sup>1</sup> See literature review.

<sup>2</sup> Conesa and Krueger study the US personal income tax but they do not study consumption taxes. See Hubbard et al. (1986) for a previous discussion on progressive income taxation in incomplete market environments.

<sup>3</sup> Gertler (1997, 1999) introduces life-cycle elements in the Yaari (1965)–Blanchard (1985) model to study the redistributive effects of Social Security between workers and retirees.

different stages in life and different categories of agents. In the proposed model, most individuals consume their disposable income during the first stage of their lives, and consume their lifetime income during the second stage of their lives. These changes in consumption behavior over the life-cycle reflect empirical evidence as shown by [Gourinchas and Parker \(2002\)](#). In my model, changes in consumption behavior result from the optimal response of agents to their environment, which is characterized by their age-dependent productivity profile and no-borrowing constraints. I assume that cohorts of individuals are born on a low labor productivity path. In the first stage of their lives, they face a constant probability of changing for a higher labor productivity path (due to a job promotion or a college graduation). In the second stage of their lives, individuals face a constant probability of death.<sup>4</sup> In addition, I assume that low income individuals are born with no assets and face an exogenous no-borrowing constraint.<sup>5</sup> Since they expect an increase in income, they do not accumulate wealth. On the contrary, they would like to borrow to shift consumption from the future to the present. Consequently, the no-borrowing constraint is binding and they consume their disposable income. In my model, those individuals are “the poor”. High income individuals do not face no-borrowing constraints and consume their lifetime income. They anticipate their entire productivity profile, which declines with retirement. In anticipation of this decline, they build up life-cycle saving.<sup>6</sup> In my model, those individuals are “the rich”.<sup>7</sup> The proposed model is consistent with recent empirical results about credit constraints in the US showing that wealth and age reduce the chance of being constrained ([Crook and Hochguertel \(2007\)](#)). In my model, there are poor and rich individuals of all ages but at the aggregate level the proportion of poor people in the population is large for young ages whereas the proportion of rich people is large for older ages. The no-borrowing constraint is faced by the poor who hold no wealth and is concentrated on the younger population.

In this framework, the government finances an exogenous public spending sequence using a capital income tax, consumption taxes and progressive labor-income taxes. The model is calibrated to reflect the main characteristics of the US economy. In the first place, I eliminate capital income taxation. Since there is no precautionary saving but only life-cycle saving in the model, the economy is not over-accumulating capital and eliminating capital income taxation improves efficiency. The elimination of capital income taxation has regressive effects and generates a large budget deficit. Hence, in the second place, I determine changes in consumption tax levels that offset the effects on the budget balance in the steady state. In the third place, I adjust the progressivity of labor-income or consumption taxes to offset redistributive effects of the previous tax changes, while maximizing the overall welfare gains of each reform in the long run.

<sup>4</sup> As a result, the size of the cohort of low income individuals decreases with age until disappearance. The size of a cohort of high income individuals also decreases with age until death.

<sup>5</sup> The literature about endogenous borrowing constraints provides a justification for the assumptions of the model. [Aghion et al. \(1999\)](#) show that the amount lenders are prepared to lend is capped by an amount proportional to the borrower's wealth. The justification of borrowing limits is that borrowers may choose not to repay their loans. In my model, the binding no-borrowing constraint relates to the fact that the poor have zero wealth. According to the same logic, the rich would face a non-binding no-borrowing constraint. To simplify, I assume that they do not face a no-borrowing constraint. Whether I assume a non-binding constraint or no constraint, it simply implies that the rich can reallocate consumption over different periods of time (the Euler condition in their optimization program is verified).

<sup>6</sup> In the model, in the absence of income uncertainty, precautionary saving is ruled out. [Feigenbaum \(2007\)](#) shows that in a finite horizon general equilibrium model, the contribution of precautionary saving to the capital stock is negligible in the presence of exogenous borrowing constraints.

<sup>7</sup> In the presence of a binding no-borrowing constraint faced by the poor, this life-cycle model is isomorphic to a model with two separate categories of agents who differ by their skills profiles and probabilities of dying, and in which the poor behave like impatient consumers and the rich behave like patient consumers.

Welfare gains are measured by the average compensated variation. Redistribution neutrality is defined to be welfare gains that are identical for the poor and the rich under different tax regimes. To account for transition costs, following [Conesa and Krueger \(2006\)](#), fixed-wage welfare gains are also calculated.

Contrary to the previous literature, I show that progressive taxation makes it possible to achieve distribution neutrality without canceling out the welfare gains from the elimination of capital income taxation. Progressivity implies that labor-income taxation or consumption taxation increases over the life-cycle. This affects the poor's and the rich's decisions as follows. The *level* of the capital income tax and the percentage *change* in the consumption tax affect the intertemporal decisions of the rich. Therefore, consumption taxation distorts the consumption saving decision of the rich only at the time it is changed whereas capital income taxation affects the whole consumption path. As a result, the elimination of capital income taxation and its replacement with a higher consumption tax stimulates capital accumulation by the rich, who attain a higher stock of capital and consumption level in the new steady state. The resulting welfare gain dominates the welfare loss from the static distortions due to higher labor-income or consumption taxes faced by the rich. As long as the poor anticipate an increase in income over the life-cycle and face a binding no-borrowing constraint, her only decision is a static choice between consumption and leisure. A lower tax rate on consumption or leisure has substitution and wealth effects resulting in higher consumption and leisure for the poor. By enabling consumption smoothing, larger overall welfare gains are achieved with a progressive consumption tax rather than a uniform consumption tax.

The results can be summarized as follows.<sup>8</sup> *First, replacing capital income taxation with progressive rather than uniform consumption taxation generates higher welfare gains in the long run (12.06% against 9.88%) and during the transition to the steady state (12.45% against 10.52%). Second, while this type of reform achieves redistribution neutrality only in the long run, it generates welfare gains for the whole population during the transition. Those results vary in magnitude but stay qualitatively robust when non-homothetic preferences are considered and progressivity in consumption taxation is achieved by subsidizing consumption of the poor. Third, whether the government should resort to more progressive consumption or labor-income taxes with respect to long term objectives depends on the choice of preferences. With homothetic preferences, if capital income taxation is replaced with more progressive labor-income taxes, the largest welfare gains are achieved (17.77%) but the increase in output is the smallest (6.76%) among reforms that are distributionally neutral. With non-homothetic preferences, if capital income taxation is replaced solely with more progressive consumption taxation, the largest welfare and output gains are achieved (respectively 32.6% and 26.36%). However, with homothetic or non-homothetic preferences, when the tax reform involves progressive labor-income taxation, redistribution effects are smaller during the transition than with any consumption tax reform.*

The paper is organized as follows. In the second section, I review the literature. In the third section, the formal framework is presented. In the fourth section, I calibrate the model. In the fifth section, I present the results.

## 2. Literature review

A large number of past contributions have studied tax reforms that pursue one primary objective: the reduction of distortions due to proportional taxation. In particular, tax reforms generally target the elimination of capital income taxation which in many cases leads to the largest distortions<sup>9</sup> and as a result raises little revenue.<sup>10</sup> To

<sup>8</sup> Results (3), (4) and (5) in Section 5.

<sup>9</sup> See [Auerbach and Hines \(2001\)](#) for an overview of the optimal taxation theory in closed economies, and [Slemrod \(2007\)](#) for the open economy.

<sup>10</sup> [Gordon and Slemrod \(1988\)](#).

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