



# Transitional dynamics and the optimal progressivity of income redistribution <sup>☆</sup>



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## ABSTRACT

We compute the optimal non-linear tax policy for a dynastic economy with uninsurable risk, where generations are linked by dynastic wealth accumulation and correlated incomes. Unlike earlier studies, we take full account of the welfare distribution along the transition to the new steady state following a once-and-for-all change in the tax system. Findings show that accounting for transitional dynamics leads to a more progressive optimal tax system than one would obtain by only comparing steady states. Starting at the U.S. status quo, the optimal tax reform is a slight to moderate reduction in the progressivity of the tax system, depending on how much the policy maker cares about future generations.

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## 1. Introduction

Most modern governments implement a redistributive fiscal policy, where incomes are taxed at an increasingly higher rate, while transfers are skewed towards the poor. Such policies are thought to deliver a more equitable distribution of income and welfare, and, thereby, provide social insurance both for the currently alive, who face income fluctuations, and for future generations, who face uncertainty about what conditions they will be born into.

In market economies, such egalitarian policies can be costly as they disrupt the efficiency of resource allocation. Therefore, the added benefit of a publicly provided social safety net, that is over and above what is available to people through other sources, such as their family or the private sector, has to be carefully weighed against this cost. In this paper, we provide such an analysis of the optimal degree of income redistribution for a utilitarian government.

The optimal design of a redistributive tax system is, however, subject to constraints. We emphasize three. First, agents may have access to insurance through other means. Savings and bequests, in particular, provide a natural source of insurance against adverse economic outcomes. A redistributive tax policy would alleviate the need for such self-insurance and crowd out accumulation of capital, leading to reduced investment.

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Second, informational frictions may prevent the government from observing individual productivity. Consequently, it levies taxes on total income, which leads to well-known incentive problems as higher taxes discourage labor and thereby reduce output.

Third, the policymaker has to be cognizant of the implications of its tax policy on prices. Large-scale shifts in labor supply and savings alter the wage rate and the interest rate, which may have redistributive repercussions for income.

We explicitly address these constraints in a dynastic general equilibrium model with incomplete markets and endogenous labor supply, where generations are linked through a correlated income process. Individuals are faced with idiosyncratic fluctuations in their own income and they are uncertain about their offsprings' income. Agents do not have access to contracts contingent on future outcomes. They can, however, save and transfer wealth to subsequent generations, but may not pass their debt onto them. This is essentially an Aiyagari–Bewley–Huggett setting with a borrowing constraint.

In this setting, we search for the optimal redistributive income tax scheme. Our approach to the problem is primarily quantitative and is in the tradition of Ramsey (1927).<sup>1</sup> The policy maker may not modify the financial structure of the economy. It cannot, for instance, introduce new assets or allow parents to accept obligations for their kids. It may, however, implement a transfer scheme, for example to transfer income to poor agents. Transfers and government expenditures are financed by taxes levied on labor and capital income. The set of tax policies is restricted to parametric forms albeit flexible ones. The tax schedule used here not only provides a good fit to the current U.S. system, but also allows for a variety of tax systems, such as progressive, flat, and regressive taxes. We assume that the government can commit to a once-and-for-all change in the tax policy, and ask two questions: Which tax policy maximizes average welfare *at the steady state* of our model economy? Which tax policy maximizes average welfare starting from the current wealth and income distributions in the U.S., *taking into account the entire transition path* until a new steady state is reached? Since the transition to an optimal steady state may be costly, the optimal reform starting at the status quo will in general be different from the optimal steady-state policy.

We find that when the transitional dynamics are ignored, the optimal tax policy for the long-run steady state is moderately regressive. *Ceteris paribus*, a less progressive tax system fosters creation of wealth and income by raising the after-tax return to labor and savings, resulting in higher average consumption. The improvement in consumption levels is weighed against larger wealth and income inequality implied by regressive taxation, an undesirable feature for a utilitarian government. The latter, however, is mitigated for two reasons. First, the larger supply of capital lowers the interest rate while boosting the wage rate, as labor complements capital in production. This redistributes income away from the wealthy, who rely primarily on capital income, to consumption-poor agents who rely heavily on labor income, and counterbalances the increase in inequality generated by regressive taxation.<sup>2</sup> Second, the availability of self-insurance through savings considerably limits the translation of income inequality to consumption inequality. These mechanisms are effective until moderate levels of regressivity, beyond which the disutility from working even more hours outweighs that of additional income, so that hours worked do not increase further. Output and average consumption thus stop rising, while inequality keeps growing, leaving no incentive for the government to reduce regressivity further.

When the transition path is considered, a sudden switch to a regressive tax system from the current U.S. system is not desirable. Accumulation of the additional capital requires limited consumption of goods and leisure along the transition path, which limits the welfare gains from changing the tax policy. In addition, the welfare gains associated with having a higher capital stock realize only slowly since capital takes time to build. By contrast, a sudden change in the tax system involves large and immediate transfers of income which leads to substantial income inequality in the short run. Due to discounting by households, these concerns outweigh the long-run benefits of regressive income taxation.

As a result, the optimal tax reform is much more progressive when welfare during the transition to a new steady state is considered. The optimal degree of progressivity depends on how much the policy maker values future generations. When the policy maker only cares about the current generation, that is when future generations are valued only indirectly through altruistic motives of parents, a utilitarian government prefers a tax system that is close to the current status quo in the U.S. When the policy maker values future generations directly, with the same weight that altruistic parents use, the optimal tax reform is a moderate reduction in the progressivity of the tax system.

The literature on optimal taxation is vast. The approach here is closest to Conesa and Krueger (2006) and Conesa et al. (2009), who calculate the optimal progressivity of income taxes for an OLG economy with incomplete markets and heterogeneous agents. Heathcote et al. (2014) take a similar approach to compute optimal progressivity in a Blanchard–Yaari–Bewley economy with partial insurance, and without capital. Relative to these papers, we make two contributions. First, we introduce intergenerational income risk and allow dynasties to self-insure via capital accumulation and bequests.<sup>3</sup> The results show that both components are important in gauging the value added by publicly provided social insurance, and for modeling the appropriate consumption response to tax policy. In particular, when self-insurance via savings is available,

<sup>1</sup> A parallel set of papers study the implications of information frictions in dynamic economies for allocations that are efficient under incentive-compatibility constraints (Mirrlees, 1971; Golosov et al., 2003; Kocherlakota, 2005; Farhi and Werning, 2012).

<sup>2</sup> A similar result appears in Davila et al. (2012), where saving subsidies raise the wage rate in equilibrium, and, thereby, the welfare of the poor who rely primarily on labor income.

<sup>3</sup> In the OLG framework of Conesa and Krueger (2006) and Conesa et al. (2009), all bequests are accidental, and they are completely redistributed among newborns. Thus, in contrast to our setting, there is neither intergenerational income risk nor self-insurance across generations in these papers. Heathcote et al. (2014) abstract from capital altogether for tractability reasons.

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