Journal of Economic Dynamics & Control 68 (2016) 1–16

Contents lists available at ScienceDirect

Journal of Economic Dynamics & Control

journal homepage: www.elsevier.com/locate/jedc

# NIT picking: The macroeconomic effects of a Negative Income Tax

Martin Lopez-Daneri

*University of Southern California, USC-Dornsife INET, 3620 South Vermont Ave., Kaprielian Hall, Room: 300. Los Angeles 90089, California, USA*

ARTICLE INFO

*Article history:*
Received 22 January 2016
Received in revised form
19 April 2016
Accepted 20 April 2016
Available online 27 April 2016

*JEL classification:*
E13
H21
H24

*Keywords:*
Negative Income Tax
Income tax
Basic income
Welfare system
Efficiency
Distribution

ABSTRACT

I study a revenue-neutral reform of the U.S. income tax and welfare system that involves the adoption of a Negative Income Tax (NIT). The reform is undertaken in a life-cycle economy with individual heterogeneity and uninsurable idiosyncratic labor risk. The optimal NIT consists of a 22% rate and a transfer equivalent to 11% of per-capita GDP. The ex-ante average welfare gain is a 2.1% annual increase of individual consumption. I show that a NIT outperforms a flat tax reform (income tax plus deduction) by a considerable margin. The key consequence of the reform is that high-productivity agents increase their relative importance in the labor supply at the expense of low-productivity agents.



## 1. Introduction

The discussion on the merits of adopting unconditional basic income programs is a long-dated debate that is gaining momentum at present. Several countries in Europe are exploring the possibility and some have already passed basic income proposals; in the United States, there are calls to reform the entire welfare system (Steuerle, 2012; Murray, 2006; Alexander, 2013; among others) and there is an ongoing debate on whether to expand the Earned Income Tax Credit (EITC) to a broader audience.[1] Under an unconditional basic income program, all citizens are assured a minimum income and there are no means tests or work requirements on behalf of the recipients, making it an effective tool to fight poverty without the administration costs of the current web of welfare programs. Naturally, a universal basic income can be instrumented in several ways and, following Friedman (1962), a Negative Income Tax (NIT) stands out because of its simplicity and progressive structure, thus becoming a valid candidate to replace the actual income tax and welfare system. A NIT does not distort the price system, as other income policies do, like the minimum wages policies or price controls, and it is able to

*E-mail address:* mlopezdaneri@gmail.com

[1] The EITC is a refundable tax credit for low- and middle-income families who satisfy certain requirements. It was enacted in 1975, and since then it has been expanded and modified in several occasions. The most recent of these modifications was in 2009 with the American Recovery and Reinvestment Act.

http://dx.doi.org/10.1016/j.jedc.2016.04.008
0165-1889/

eradicate the so-called welfare cliffs.[2] It is no coincidence that a NIT is considered "one of the fundamental ideas of modern analysis of welfare programs" (Moffit, 2003). However, the effects that a NIT has on the labor supply or the increase on tax rates necessary to fund this minimum income is not clear yet. These are not minor questions and they need to be analyzed in the light of a general equilibrium model.

In this paper, I will make a case for a NIT and carry out the first, to the best of my knowledge, quantitative analysis of the tax in a general equilibrium setting. Specifically, I will answer the following questions: What are the macroeconomic effects of replacing the actual U.S. income tax and the welfare system with a NIT on income and earnings, labor supply, tax rates, savings, and welfare? Should we pick a NIT?

The present state of affairs makes the NIT a relevant and timely tax reform. On the one hand, the federal income tax has become increasingly complex and distortionary. Its considerable number of tax credits, deductions and overlapping provisions creates differences in the amounts paid by households earning the same level of income which lessens its progressivity and creates a fair share of distortions at all income levels. On the other hand, the welfare system makes it harder for low- and middle-income households who see their marginal tax rates surge at particular income thresholds, as many of the welfare programs in place vanish as their income increase. According to the Congressional Budget Office (Congressional Budget Office, 2012), 51% of taxpayers below 450% of the Federal Poverty Line face marginal rates higher than 30%, and 8% of them are taxed with marginal rates higher than 50%.[3] In contrast, only 5% of the high-income households are taxed at such high rates.[4]

In its simplest version, a NIT combines a constant marginal tax rate and fixed lump-sum transfer to all households. It works as follows. At the beginning of the fiscal year, all households receive a transfer from the government, say \$2000, and all income made is taxed at a constant rate, say 20%. If a household has a yearly income of \$50,000, then its total tax payments for the period will be \$8000 (\$50,000 $\times$ 20% – \$2000). This means that households earning less than \$10,000 (\$2000 $\div$ 0.2) pay no taxes and receive a positive net transfer (negative tax). All households have a guaranteed minimum income, and as income increases, the effect of the transfer declines.

To demonstrate a NIT's suitability, I study a life-cycle economy, in which agents are ex-ante homogeneous but grow different over time as a result of life uncertainty, together with age-independent and idiosyncratic productivity shocks. At any point in time, the resulting heterogeneity is characterized by the agents' shock history, their level of asset accumulation, and their age. Welfare payments are modeled as a non-linear function of income to capture the progressive structure of the U.S. welfare system. In addition, there is a social security system; once retired, agents receive benefits in the form of lump-sum payments.[5]

I calibrate this model to match several features of the U.S. economy, reproducing the actual distributions of labor earnings, wealth, federal income tax liabilities, and transfers. I focus on an equilibrium with transitional dynamics for an open economy and find the level of transfers and marginal tax rate such that the NIT reform is revenue-neutral and maximizes ex-ante welfare (i.e., expected utility prior to birth and revelation of agents' types) for an agent born at the time of the reform, taking into account the transitional path to the new steady state. My findings can be summarized as follows.

First and foremost, the NIT produces important welfare gains. A NIT with a marginal tax rate of 22% and a transfer of 11% of per-capita GDP – roughly, \$5800 – implies a welfare gain equivalent to 2.1% annual increase in consumption. Low-ability agents in the bottom quintile of the productivity distribution benefit the most, with welfare gains that range up to 25%, but there are losers under the NIT: those in the upper level of the productivity distribution. Under an optimal NIT, the degree of redistribution is not trivial.

Second, the size of the transfers plays an important role in the results. Indeed, a proportional tax – that is, a NIT with no transfers (a "non-negative income tax") – has a welfare loss of 4.1% relative to the current tax system. This result is unsurprising; redistribution is an important feature of the U.S. income tax and welfare system. The elimination of transfers benefits only the most productive agents who, as a result, face a lower marginal tax rate. The way transfers are designed is also important. A competing scenario where the welfare system is kept unchanged and a flat tax is enacted (a "non-negative income tax" with a fixed deduction instead of a transfer) likewise underperforms the NIT. In particular, the optimal flat tax (characterized by a marginal tax rate of 15% and a fixed deduction of 29% of per-capita GDP, roughly \$15,400) produces a 0.4% welfare gain.

[2] Welfare cliffs are the income levels in which there are no incentives to provide an extra hour of labor to the market because of the loss of the welfare programs. In the case of the United States, they are not trivial at all. For example, a single mother on welfare with a gross income of \$29,000 in the State of Pennsylvania has an after-tax income of \$57,327 – the exact same after-tax income she would have received if she had earned a gross income of \$69,000 (Alexander, 2013). Therefore, it would be an entirely rational choice for this single mother to reject a job offer, even for an extra \$40,000.

[3] In 2012, the federal poverty guideline for a household of two and four were \$15,130 and \$23,050, respectively (Register, 2013).

[4] In order to compute the marginal rates, the CBO takes into account the combined effects of the Supplemental Nutrition Assistance Program (SNAP) and federal taxes. If they have included all other welfare programs, the rates would have been even higher.

[5] This model is a benchmark in the macroeconomic and public finance literature, and several papers have followed this quantitative approach to optimal taxation, in which artificial economies with heterogeneous agents and incomplete markets (e.g. Huggett, 1993; Aiyagari, 1994) are simulated while the individual and aggregate effects of tax reforms are studied (e.g. Ventura, 1999; Altig et al., 2001; Domeij and Heathcote, 2004; Diaz-Gimenez and Pijoan-Mas, 2006; Nishiyama and Smetters, 2005 among others). Domeij and Heathcote (2004) study the distributional effects of reducing capital taxes; Conesa et al. (2009) study the optimal capital and labor income tax and show that the labor income tax rate should be 23% with a deduction of \$42,000, while capital should be taxed at a high 36% rate due to the life-cycle structure of the model, in accordance with the results found by Erosa and Gervais (2002). For a complete review, see Heathcote et al. (2009).