



## Flat tax reform: The Baltics 2000–2007

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### ARTICLE INFO

#### Article history:

Received 15 December 2008

Accepted 25 May 2009

Available online 6 June 2009

#### JEL classification:

E13

H20

O11

O14

#### Keywords:

Tax reform

Endogenous growth

Transitional dynamics

Flat taxes

### ABSTRACT

The paper presents an endogenous growth economy with a representation of the tax rate system in the Baltic countries. Assuming that government spending is a given fraction of output, the paper shows how a flat tax system balanced between labor and corporate tax rates can be second best optimal. It then computes how actual Baltic tax reforms from 2000 to 2007 affect the growth rate and welfare, including transition dynamics. Comparing the actual reform effects to hypothetical tax experiments, it results that equal flat tax rates on personal and corporate income would have increased welfare in all three Baltic countries by more than the actual reforms. Experiments show that movement towards a more equal balance between labor and capital tax rates, through changing just one tax rate, achieve almost as high or higher utility gains as in actual law for all three countries.

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### 1. Introduction

This paper focuses on how a balanced flat rate tax system, or movement towards this, can be optimal for the representative agent, as applied to tax reform in the Baltic economies from 2000 to 2007. Instead of the standard Ramsey optimum of a zero corporate income tax, the model economy has a Turnovsky (2000) optimum of equal flat tax rates on labor and capital income, with this rate set in turn to the output share of government spending. This results by assuming as in Barro (1990), Turnovsky (2000) and Funke and Strulik (2006) that government spending is a constant fraction of income, rather than exogenous and independent of income, and that there are zero benefits of non-transfer government spending. The model has a more comprehensive corporate sector than is typical and this allows for extension of the second-best optimum results, such that a composite labor tax rate including social security and VAT taxes is equal to the corporate income tax rate, and for more extensive tax experiments.

Applying this model to the Baltic countries, the optimum is derived and then the effects of actual tax reforms experienced from 2000 to 2007 are examined in light of the optimum. The Baltic tax reforms started in 1994 in Estonia, and by 2000 the average Baltic personal tax rates had fallen to 28% and average corporate tax rates to 16%. By 2007, the average Baltic tax rates had fallen further: to 25% for personal tax rates and to 10% for corporate tax rates. It emerges from the model results that this tax regime is not well-balanced in that it is sub-optimally weighted towards higher labor taxes. Intuitively, the

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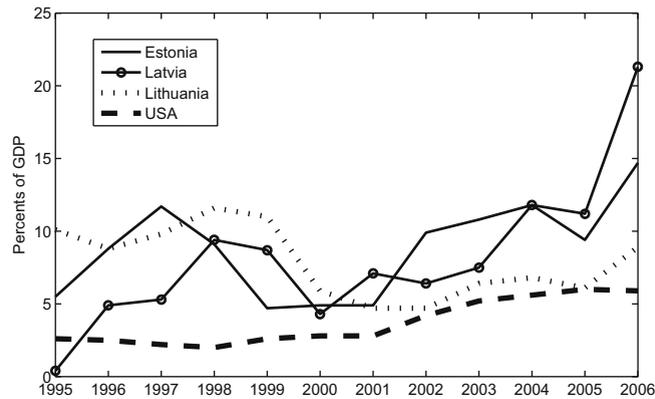


Fig. 1. Net foreign borrowing in the Baltics and the US.

economy has a central feature that the return on human capital is equal to the return on physical capital along the balanced growth path, and this in part gives rise to the desirability of balancing composite labor and corporate tax rates.

After setting up the economy (Section 2), the paper next presents the social planner problem (Section 3). It then calibrates a baseline model for each of the three Baltic countries (Section 4) and estimates the maximum possible utility gains from tax reform (Section 5.1) and the actual estimated utility gains from the 2000–2007 reforms (Section 5.2). For Latvia and Lithuania, it is shown that using only equal flat taxes, on personal and corporate income, to raise the same revenues as were raised under the 2007 tax law would have been better than the actual tax reforms instituted by 2007. And again raising the same amount of revenue as in 2007, but by changing just one tax, it is shown that lowering the personal income tax, or social security contributions, moves the countries towards more “balanced” tax rates and raises welfare by more than did the actual reforms in all three countries (Section 5.3). Also it is shown how the improvement in welfare from changing individual tax rates depends upon the initial set of tax rates; this helps explain how seemingly contradictory results from other studies for the ranking of tax reforms can be explained by different initial sets of tax rates (Section 6).

## 2. The endogenous growth economy

The economy is a closed economy model with endogenous growth so that tax changes can effect the balanced growth path equilibrium rate of output growth. This gives the advantage over an open economy model, which is specified with a given real interest rate and an exogenous output growth rate, in that welfare calculations in the closed economy include the effect on the growth rate. In addition, Fig. 1 shows that the US, which is typically analyzed as a closed economy, had in several years after 2000 nearly the same net foreign borrowing as Lithuania.<sup>1</sup> So while the Baltic countries are undoubtedly more open than the US, the analysis uses the closed economy as a first way to approximate such tax effects, as do Funke and Strulik (2006).<sup>2</sup>

The endogenous growth model shares common elements with Kim (1998) and Devereux and Love (1994). As in Kim (1998), the paper introduces a realistic tax system while the specification of preferences and technology resembles that of Devereux and Love (1994). A corporate sector, as the representative firm, is introduced following Turnovsky (1995, Chapters 10 and 11), so as to account for different types of corporate income and dividend tax treatment. We assume that there are no new equity issues, that investment is financed by retained earnings, and that the remaining income is distributed as dividends. Also, as in Kim (1998), we account for the added complexity of the difference between the actual depreciation rate and the accounting depreciation rate. The most closely related paper in terms of the study of tax reform in the Baltic countries is Funke and Strulik’s (2006) interesting closed economy analysis of Estonia’s 2000 tax reform, although that paper assumes exogenous growth while we use endogenous growth.

### 2.1. The consumer problem

The representative consumer’s utility, with  $\theta > 0$ ,  $\epsilon \geq 0$  and  $\beta \in (0, 1)$ , depends at time  $t$  on consumption  $C$  and leisure time  $l$ :

$$U = \sum_{t=0}^{\infty} \beta^t \frac{(C_t l_t^\epsilon)^{1-\theta}}{1-\theta}. \quad (1)$$

<sup>1</sup> The data on the Baltic countries are from Eurostat’s database, while the data on the USA are from the OECD database; Net Borrowing is the net resources that the given economy receives from the rest of the world.

<sup>2</sup> Our experiments with an open economy model with a given real interest rate found the same ranking of tax reforms as in the closed economy model presented here.

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