Available online at www.sciencedirect.com
SCIENCE DIRECT®
ELSEVIER
Journal of Monetary Economics 50 (2003) 871–887
Journal of MONETARY ECONOMICS
www.elsevier.com/locate/econbase

The optimal mix of taxes on money, consumption and income ☆

Fiorella De Fiore[a], Pedro Teles[b,c,d,e,*]

[a] *Directorate General Research, European Central Bank, Kaiserstrasse 29, 60311, Frankfurt am Main, Germany*
[b] *Research Department, Federal Reserve Bank of Chicago, 230 S. LaSalle Street, Chicago, IL 60604, USA*
[c] *Centre for Economic Policy Research, London, UK*
[d] *Banco de Portugal, Lisbon, Portugal*
[e] *Universidade Catolica Portuguesa, Lisbon, Portugal*

Received 8 September 1998; received in revised form 30 January 2002; accepted 23 April 2002

Abstract

We determine the optimal combination of taxes on money, consumption and income in transactions technology models where exogenous government expenditures must be financed with distortionary taxes. We show that the optimal policy does not tax money, regardless of whether the government can use as alternative fiscal instruments an income tax, a consumption tax, or the two taxes jointly. These results are at odds with recent literature. We argue that the reason for this divergence is an inappropriate specification of the transactions technology adopted in the literature.

JEL classification: E31; E41; E58; E62

Keywords: Friedman rule; Inflation tax; Transactions technology

☆ We wish to thank Isabel Correia for very insightful comments. We also thank an anonymous referee. Remaining errors are ours. De Fiore and Teles acknowledge financial support by the Ente Einaudi and by FCT, respectively. The views stated herein are those of the authors and not necessarily those of the Federal Reserve Bank of Chicago, the Federal Reserve System, or the European Central Bank.

*Corresponding author. Research Department Federal Reserve Bank of Chicago, 230 S. LaSalle Street, Chicago, IL 60604, USA. Tel.: +1-312-322-2947; fax: +1-312-322-2357.

E-mail address: pteles@frbchi.org (P. Teles).

0304-3932/03/$ - see front matter
doi:10.1016/S0304-3932(03)00034-5

1. Introduction

In this paper, we determine the optimal combination of taxes on money, consumption and income in transactions technology models where exogenous government expenditures must be financed with distortionary taxes. We show that the optimal policy does not tax money, regardless of whether the government can use an income tax, a consumption tax, or the two taxes jointly, as alternative fiscal instruments to the tax on money. This result contradicts the claims raised in the optimal inflation tax literature, that the conditions for the optimality of a zero tax on money depend on the choice of the alternative tax instrument. We argue that the reason for this divergence is an inappropriate specification of the transactions technology adopted in the literature.

The debate on the optimal tax on money dates back to Friedman (1969) and to his policy rule of a zero nominal interest rate. This rule was justified with the first best argument that the price charged for the use of real balances should be set equal to the production cost, which is approximately zero. Phelps (1973) challenged the relevance of Friedman's (1969) result by arguing that, in a second best world where government expenditures must be financed with distortionary taxes, liquidity should be taxed as any other good. Recent literature has revised the argument of Phelps (1973). In particular, Kimbrough (1986) criticizes Phelps's (1973) conclusion on the basis that liquidity should not be modelled as a final good but rather as an intermediate good in the production of transactions. Kimbrough (1986) assumes a transactions technology where transactions time is a function of consumption expenditures gross of taxes and real money holdings. For a technology that is homogeneous of degree one, Kimbrough (1986) shows that the Friedman rule is optimal in a second best environment. This result appears to be consistent with Diamond and Mirrlees (1971) optimal taxation rules of intermediate goods. According to these rules, if the technology is constant returns to scale and if taxes on final consumption goods are available, intermediate goods should not be taxed.

Correia and Teles (1996) generalize the optimality of the Friedman rule to homogeneous transactions technologies of any degree and provide a different explanation for the result. The optimality of the Friedman rule is a general result because money is costless to produce. If money were modelled as a costly intermediate good, the optimal tax on money would be zero only if the transactions technology were homogeneous of degree one. For homogeneous technologies of other degrees, such as the one considered by Baumol (1952) and Tobin (1956), the tax would be different from zero. However, as the cost of producing money is assumed to be arbitrarily close to zero, even if the optimal ad valorem tax or subsidy is bounded away from zero, the optimal price charged for the use of money also approaches zero.

Correia and Teles (1996) solve the optimal inflation tax problem by comparing the inflation tax to an income tax. The policy exercise performed by Kimbrough (1986), instead, was to compare the inflation tax to a consumption tax. This is an important distinction because, while income taxes do not affect monetary transactions directly, consumption taxes need to be paid by the households each time a consumption good