The optimal inflation tax when money reduces transactions costs

A reconsideration

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It has been argued that, if money acts as an intermediate good, the optimal inflation tax is zero. This paper reexamines such a claim in the context of a model in which money reduces transactions costs. It is shown that modeling money as an intermediate good does not necessarily imply that the optimal inflation tax is zero. The optimality of a zero inflation tax depends on the properties of the transactions costs technology. In particular, if the transactions costs technology does not exhibit constant returns to scale, it is optimal to resort to the inflation tax.

Keywords: Optimal inflation tax; Transactions costs technology

1. Introduction

The optimality of the inflation tax in the presence of distortionary taxation has been the focus of much attention ever since Phelps (1973) pioneered the study of the inflation tax in a public finance context. Phelps concludes that it may be optimal for the government to drive a wedge between the private and the social cost of money (typically assumed to be zero).[1] The government may thus

[1]Similar results have been derived by Marty (1978), Siegel (1978), and Drazen (1979), among others.

find it optimal to use both an income tax and the inflation tax to finance its spending. In deriving this result, Phelps (1973) includes real money balances as an argument in the utility function.

Kimbrough (1986a, b) reaches the opposite conclusion regarding the optimality of a positive inflation tax in the presence of distortionary taxation. Modeling money as reducing transactions costs (in terms of 'shopping' time), Kimbrough (1986a) shows that it is always optimal to set the inflation tax equal to zero.[2] Thus, all public spending should be financed by means of a consumption tax. In contrasting his result to Phelps's (1973), Kimbrough (1986a, b) claims that the key lies in the different role performed by money: since money acts as an intermediate good (i.e., it is an input in the production function), it follows from public finance considerations that it should not be taxed. The difference between Phelps's (1973) and Kimbrough's (1986a) results is thus explained by the latter in terms of the different role (i.e., final versus intermediate good) that money is assumed to play. Furthermore, Kimbrough's (1986a) result has been taken to apply generally. For instance, Kimbrough (1986b, p. 137) argues that the optimality of a zero inflation tax should hold for 'any economy in which, in equilibrium, scarce resources are used up in the transaction process and agents can economize on these transactions costs by holding money', because money is an intermediate good.[3]

This paper reexamines the optimality of the inflation tax, under both income and consumption taxation, when money is modeled as reducing transactions costs. We consider a general form of the transactions costs technology in the sense that only *minimal* conditions – with which, in principle, it is hard to disagree – are imposed: (i) shopping time is nondecreasing in consumption expenditure and nonincreasing in real money balances, and (ii) the transactions costs technology is convex. The conclusion that emerges from the analysis is that the optimal inflation tax is not necessarily zero. Specifically, if the transactions costs technology does not exhibit constant returns to scale (CRS), it is not optimal to follow the optimum quantity of money rule under either consumption or income taxation. If the transactions costs technology exhibits CRS, a zero inflation tax is optimal under income taxation. Under consumption taxation, however, the optimality of a zero inflation tax depends on whether

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[2]If the consumption tax carries collection costs [Aizenman (1987), Végh (1989a), and Dixit (1991)] or there is currency substitution [Végh (1989b)], it is optimal to tax money balances. In the presence of heterogeneous consumers and increasing returns to scale in the transactions technology, the optimality of a zero inflation tax depends on the parameter configuration [Faig (1988)].

[3]Persson, Persson, and Svensson (1987, p. 1421), for instance, introduce money in the utility function and argue that, for their arguments to go through, 'it is important . . . that the liquidity services produced by money are equivalent to a final good (like increasing leisure by saving trips to the bank). If money is equivalent to an intermediate input, the optimal inflation tax is zero, in analogy with the optimum taxation result that production taxes should be zero. Cf. Kimbrough (1986).' Lucas (1986) also makes the point that money being an intermediate good should imply that the optimal inflation tax is zero. See also Trehan and Walsh (1990) and Den Haan (1990).