



Infinite-maturity public debt and the fiscal theory of the price level

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Abstract

The fiscal theory of the price level asserts that the price level is determined by the ratio of outstanding public nominal debt into the present value of real primary budget surpluses of the government. We here argue that price determinacy, in general, fails when at least part of the public debt takes the form of securities of infinite maturity. Indeed, price determinacy requires non-Ricardian fiscal plans and a predetermined nominal debt of the government. As no equilibrium restriction prevents the occurrence of a speculative bubble on infinite-maturity public debt, the initial nominal debt of the government is indeterminate and so is the price level under canonical specifications of non-Ricardian fiscal plans.

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1. Introduction

A non-Ricardian fiscal regime is defined by Woodford (1994, 1998, 2001, 2003) as a policy such that government primary surpluses or revenues from inflation need not

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be readjusted after some initial fiscal disturbance. This policy contradicts a common understanding, exemplified by Sargent and Wallace's (1975, 1981) unpleasant monetarist arithmetic, according to which a fall in money creation can only be followed by a reduction of future government deficits or a rise in future inflation.

In a non-Ricardian regime, the price level is determined by the present value budget constraint of the government. In fact, treating seignorage as negligible, equilibrium requires a sort of valuation equation for government debt of the form

$$\frac{\text{Nominal government debt}}{\text{Price level}} = \text{Present value of primary surpluses.}$$

Outstanding nominal debt is predeterminate and, in a non-Ricardian regime, primary public budget surpluses are set according to some given rule, independent of a public intertemporal budget constraint, so that the price level serves to fulfill the valuation equation. In addition, under an interest rate pegging and exogenously given fiscal plans, the most canonical case in the literature, public liabilities, consisting of money balances and government debt, are endogenously determined by the sequence of government budget constraints. This procedure is known as the 'fiscal theory of the price level'.

In the present note, we argue that price determinacy fails, under a non-Ricardian regime, when primary public surpluses are set exogenously and at least part of the government liabilities are in the form of *infinite-maturity* nominal securities, like perpetuities, whose market value is to be determined at equilibrium. In fact, we shall show that, as speculative bubbles on infinite-maturity public debt are not ruled out by any of the equilibrium restrictions, the price level is indeterminate under the non-Ricardian regime, when nominal interest is pegged by the Central Bank.¹

The reason for the indeterminacy is easy to grasp and can be understood through a simple intertemporal accounting. According to the fiscal theory, the price level is jointly determined by the present value of government future surpluses and the current value of government interest-bearing bonds. Neglecting seignorage and assuming that public debt entirely consists of perpetuities, at equilibrium, a valuation equation for government debt imposes

$$\frac{\text{Perpetuity price} \times \text{Perpetuity stock}}{\text{Price level}} = \text{Present value of primary surpluses.}$$

This single restriction involves two distinct unknowns: the price level and the perpetuity price. Illegitimately, assuming that public debt were quoted at its fundamental value,

$$\text{Perpetuity price} = \text{Present value of perpetuity nominal dividends,}$$

¹A similar point is made by Bloise (2005) with respect to infinitely lived real productive assets. Though in both cases speculative bubbles occur at equilibrium, equilibria arising in the case of infinite-maturity public debt differ from those with real productive assets as intertemporal public budget constraint is balanced and, so, speculative bubbles do not require that government liabilities become negative in the long-run, an unappealing feature of equilibria with a speculative bubble on real productive assets.

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