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# Interest rate rules, price determinacy and the value of money in a non-Ricardian world

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## Abstract

This article studies under which conditions interest rate rules “à la Taylor” [1993. Discretion versus policy rules in practice. Carnegie–Rochester Conference Series on Public Policy 39, 195–214] lead to price determinacy. We scrutinize notably two famous results, which are standard in the traditional “Ricardian” model with a single dynasty of consumers: (1) a pure interest rate peg leads to nominal price indeterminacy; (2) a strong reaction (usually more than one for one) of nominal interest rates to inflation is conducive to price determinacy (the Taylor principle). This article extends the analysis to rigorous dynamic non-Ricardian models. The results turn out to be quite different, since notably prices may be determinate if the interest rate responds less than one for one to inflation, and even under a pure interest rate peg.

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## 1. Introduction

Following Taylor's (1993) seminal article, there has been recently a very strong renewal of interest in the study of interest rate rules for monetary authorities (for a survey of recent work, see for example McCallum, 1999; Taylor, 1999). In line with the recent trends in macroeconomics, several authors quite naturally investigated interest rate policies in rigorous dynamic general equilibrium models.

Most rigorous studies of optimal interest rate rules in such a maximizing framework have been cast in "Ricardian" economies populated with a single dynasty of consumers.<sup>1</sup> These economies have, however, as far as policy analysis is concerned, a number of particular properties, and it thus seems legitimate, in line with the intuition first developed in Bénassy (2000), to extend the analysis of interest rate rules to non-Ricardian economies where new agents enter in each period, and to see whether this makes a difference or not for the analysis. We shall see that it does.

In this article we shall be particularly concerned with the issue of price determinacy under various monetary rules. We shall notably scrutinize two particularly famous results:

- The first one, which originates with the article by Sargent and Wallace (1975), basically says that, under a pure nominal interest rate peg, there is nominal indeterminacy.<sup>2</sup> This means that, if a sequence of prices is an equilibrium, then any sequence multiple of the first one is also an equilibrium. This is no minor problem since many optimal policy packages include the famous "Friedman rule," according to which the nominal interest rate should be set equal to zero.<sup>3</sup>
- The second one is often referred to as the "Taylor principle."<sup>4</sup> The basic idea is that, in order to make prices determinate the central bank should respond "aggressively" to inflation. If interest rates respond only to inflation, a classic result is that, in order to have determinate prices, nominal interest rates should respond more than one for one to inflation.<sup>5</sup>

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<sup>1</sup> So we shall use the terminology "Ricardian" for economies with a single dynasty of consumers, and "non-Ricardian" for economies where new consumers arrive in time. This terminology has its root in the "Ricardian equivalence" result (Barro, 1974), according to which, in an economy with a single dynasty of consumers, the timing of (lump sum) taxes is irrelevant as long as the government intertemporally balances its budget, whereas it matters in a non-Ricardian economy. Note that other factors than demographics can make an economy non-Ricardian.

We should point out that this meaning of "Ricardian" is quite different from a later one which differentiates Ricardian and non-Ricardian *policies*, and which has been adopted by authors working on the "fiscal theory of the price level" (see, for example, Kocherlakota and Phelan, 1999, and Woodford, 2003, for lucid expositions).

<sup>2</sup> For a useful taxonomy of various forms of indeterminacy, see McCallum (1986).

<sup>3</sup> This rule originates in Friedman (1969). The intuition is that, since money costs nothing to produce, its services should be priced at zero.

<sup>4</sup> It should be noted that, although Taylor (1993) recommends a strong response of interest rates to inflation, this is not for the reasons explored in this article. The reasoning (see, for example, Taylor, 1998) is that if the nominal interest rate responds more than one for one to inflation, the real interest rate will respond positively to inflation, which should have a stabilizing influence on the economy.

<sup>5</sup> Early results in this direction on price determinacy and monetary rules are found in Leeper (1991).

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