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Journal of Monetary Economics 50 (2003) 1153–1175
Journal of MONETARY ECONOMICS
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Multiple-solution indeterminacies in monetary policy analysis ☆

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Received 22 November 2002; accepted 3 March 2003

Abstract

A sizeable fraction of recent research on monetary policy has been concerned with issues relating to analytical "indeterminacies"—i.e. multiple solutions in rational expectations (RE) models. Most of the literature features sophisticated RE analysis conducted within dynamic models that reflect optimizing behavior by individual agents and incorporate Taylor-style policy rules. A few papers have suggested that some of the particular indeterminacy arguments are misleading or irrelevant. For the most part, however, there has been little dissent from the position that these indeterminacies present a genuine problem for monetary policy makers. The purpose of the present paper, by contrast, is to argue that conclusions based on multiple-solution indeterminacy findings are of dubious merit rather generally.
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JEL classification: E52

Keywords: Monetary policy

1. Introduction

A sizeable fraction of recent research on monetary policy has been concerned with issues relating to analytical "indeterminacies"—i.e., multiple solutions in rational

☆ This paper was prepared for the Carnegie–Rochester Conference on Public Policy, held at Carnegie Mellon University on November 22–23, 2002. For helpful comments and suggestions, I am indebted to George Evans, Marvin Goodfriend, Edward Nelson, and Michael Woodford.

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doi:10.1016/S0304-3932(03)00061-8

expectations (RE) models. Prominent topics for which this type of indeterminacy is central to the analysis include (i) the "Taylor principle" (Clarida et al., 1999, 2000; King, 2000; Woodford, 2002); (ii) inflation forecast targeting (Woodford, 1994a, 2002; Bernanke and Woodford, 1997; Kerr and King, 1996; Carlstrom and Fuerst, 2001; Bullard and Mitra, 2002); (iii) the zero-lower-bound deflation trap (Benhabib et al., 2001, 2002; Alstadheim and Henderson, 2002); (iv) the fiscal theory of the price level (Woodford, 1994b, 1995, 2001; Sims, 1994; Cochrane, 1998; Kocherlakota and Phelan, 1999). The papers just mentioned, moreover, include only a sample of leading items, not an exhaustive listing. Most of the literature features sophisticated RE analysis conducted within dynamic models that reflect optimizing behavior by individual agents and incorporate Taylor-style policy rules.

A few papers have suggested that some of the particular indeterminacy arguments are misleading or irrelevant; these include Buiter (1999) and McCallum (1999b, 2001a, 2001b). For the most part, however, there has been little dissent from the position that these indeterminacies present a genuine problem for monetary policy makers. The purpose of the present paper, by contrast, is to argue that conclusions based on multiple-solution indeterminacy findings are of dubious merit rather generally. In each of the mentioned cases, that is, there is at most one RE solution that should be regarded as plausible, the others reflecting theoretical curiosities that are not of relevance for actual economies. As it happens, the plausible solution in most or all of the cases studied is the minimum-state-variable (MSV) solution defined in McCallum (1983, 1999b), which is unique by construction in linear models. The principle basis of the argument developed here depends, however, not on any alleged "fundamental" or "bubble-free" nature of the MSV solution, but on the E-stability and adaptive learnability of this solution as defined and explored in important recent publications by Evans and Honkapohja (1999, 2001).

The outline of the paper is as follows. In Section 2, two preliminary issues of a partly terminological but also substantive nature are taken up, so as to avoid ambiguity or confusion later in the discussion. Next, Section 3 provides a brief summary of the E-stability/least-squares learnability approach and includes a brief argument for its importance. Then in Sections 4–7 the four topics mentioned above are considered in turn, with each presented in the simplest possible setting. Finally, a short concluding section is provided.

2. Preliminaries

There are two partly terminological issues that should be confronted at the outset, so as to avoid ambiguities based on different implicit definitions. The first of these is the nature of the MSV solution. Throughout, I will be using that term to designate the solution yielded by the procedure of McCallum (1983, 1999b), which is designed to be unique by construction. This terminological usage agrees with that of Evans (1986, 1989) and Evans and Honkapohja (E&H) (1992) but differs from that employed in the latter's more recent publications (E&H, 1999, p. 496, 2001, p. 194).

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