



Monetary policy, learning and the speed of convergence

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Abstract

Under the assumption of bounded rationality, economic agents learn from their past mistaken predictions by combining new and old information to form new beliefs. The purpose of this paper is to investigate how the policy-maker, by affecting private agents' learning process, determines the speed at which the economy converges to the rational expectation equilibrium. I find that by reacting strongly to private agents' expected inflation, a central bank increases the speed of convergence and shortens the length of the transition to the rational expectation equilibrium. I use speed of convergence as an additional criterion for evaluating alternative monetary policies. I find that a fast convergence is not always desirable. © 2006 Elsevier B.V. All rights reserved.

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1. Introduction

The recent literature on monetary policy has emphasized that while rational expectations is an important and useful benchmark, a policy-maker should consider the robustness of any equilibrium reached under a particular monetary policy to

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deviations from rational expectations. In the presence of structural changes, in fact, agents in the economy may need time in order to learn about the new environment¹: in the early stages of this process, previously held beliefs could lead to biased predictions. Thus, a relevant issue concerns the conditions under which learning agents end up forming rational expectations.

A common way to carry out this topic is to employ the least-squared learning approach of [Marcet and Sargent \(1989a,b\)](#) and [Evans and Honkapohja \(2001\)](#), assuming that agents in the model form expectations via econometric forecasts. In this environment, [Evans and Honkapohja \(2003a,b\)](#) and [Bullard and Mitra \(2002\)](#) suggest that economic policies should be designed to be conducive to long-run convergence of private expectations to rational expectations. Failing to do so gives rise to an equilibrium which is not robust to small expectational errors. In accordance with this literature, ‘good’ policies are those that induce a determinate and learnable rational expectations equilibrium (REE) (see [Bullard and Mitra, 2002](#)).

Another small but growing body of research is concerned with the properties of the convergence along the learning process. [Evans and Honkapohja \(1993\)](#), [Timmerman \(1996\)](#), [Sargent \(1999\)](#) and [Marcet and Nicolini \(2003\)](#) make use of learning models not only to study the asymptotic properties of the equilibrium attainable under learning, but as a compelling alternative to study economic behaviors in the short and medium-run. The works of [Giannitsarou \(2003\)](#), [Aoki and Nikolov \(2006\)](#) and [Orphanides and Williams \(2004\)](#) analyze the transition to the REE in the context of policy decisions, addressing the question of whether all policies that produce learnability and determinacy are equally good from a learning perspective.

I take up this point by adapting theoretical results of [Benveniste et al. \(1990\)](#) and [Marcet and Sargent \(1995\)](#). I first examine how the policy-maker, by affecting the private agents’ learning process, can influence the transition to the REE (i.e. the speed of learning). I show that by reacting strongly to expected inflation, a central bank can shorten the length of the transition and increase the speed of convergence to the REE. Next, I consider the case where the central bank has a stabilization objective on inflation and output gap and I focus on the optimal discretionary policy described in [Evans and Honkapohja \(2003a\)](#), *EH policy*. I show that this policy, even though it meets all of the objectives listed above (determinacy and stability under learning) and is optimal under rational expectations, is not suitable from the perspective of the speed of learning, as it implies a very slow transition. Therefore, I show how a policy-maker who wants to reach in the long run the same REE determined as under the EH policy, can manipulate the speed of learning of the private sector. Finally, I analyze the welfare implications of converging to a given REE at different speeds. My main conclusion is that fast learning is not always desirable. In the absence of an inflation bias, fast learning always increases social

¹‘It (the ECB) argues that forecasts are too inaccurate [...], especially in the early years of the euro when financial markets adjust and, more generally, when the broad public learns how to operate in a radically new environment’, [Favero et al. \(2001\)](#).

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