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Did the great inflation occur despite policymaker commitment to a Taylor rule?

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Abstract

We study the hypothesis that misperceptions of trend productivity growth during the onset of the productivity slowdown in the US caused much of the great inflation of the 1970s. We use the general equilibrium, sticky price framework of Woodford [Interest and Prices, Princeton Univ. Press, Princeton, NJ, 2003] augmented with learning using the techniques of Evans and Honkapohja [Learning and Expectations in Macroeconomics, Princeton Univ. Press, Princeton, NJ, 2001]. We allow for endogenous investment as well as explicit, exogenous growth in productivity and the labor input. We assume the monetary policymaker is committed to using a Taylor-type policy rule. We study how this economy reacts to an unexpected change in the trend productivity growth rate under learning. We find that a substantial portion of the observed increase in inflation during the 1970s can be attributed to this source.
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1. Introduction

1.1. The great inflation and the productivity slowdown

Broadly speaking, US inflation was low in the early 1960s, then high in the 1970s and early 1980s, and then lower again during the last twenty years. Figure 1 shows one measure of the dramatic rise and fall, which is sometimes called the *great inflation*. We investigate the hypothesis that much of the great inflation was due to a misperception on the part of economic actors—both the private sector and the Federal Reserve—concerning the trend pace of productivity growth. This hypothesis is associated most closely (and most recently) with Orphanides (2000, 2001, 2002, 2003). The broad idea is that it was initially very difficult for the economy's participants to detect that the productivity slowdown had occurred—that is, agents had to learn about it. The misperception caused the central bank to overestimate the size of the output gap, leading through a Taylor-type policy rule to lower-than-intended interest rates and, subsequently, higher-than-intended inflation.

Our vehicle for analysis is a version of the general equilibrium, sticky price model of Woodford (2003). We allow for endogenous investment along with explicit, exogenous growth, both of which we view as essential for discussion of this issue. We include learning to capture the idea that it took some time for the economy's participants to evaluate the changing nature of the nation's balanced growth path dictated by the productivity slowdown. Our learning methodology is that of Evans and Honkapohja (2001).

For the purposes of this paper, we use a Perron (1989)-style characterization of the productivity data, in which trend-stationarity is buffeted by rare breaks in trend, occurring perhaps once or twice in the postwar data.[1] Thus the process driving productivity growth is actually nonstationary, but the permanent shock occurs only rarely, not each period. The agents in our model—both the central bank and the private sector—understand that such structural change may occur, and employ learning algorithms to ensure that they will be able to adjust following such shocks. In this sense the agents in our model are protecting themselves against the possibility of *structural change*—permanent changes in key aspects of the economy, like the pace of productivity growth—by re-estimating their perceived laws of motion for the economy each period. When there is no structural change for a period of time, our systems will simply converge to a small neighborhood of the rational expectations equilibrium, balanced growth path. But when structural change occurs, the agents will be able to learn the new balanced growth path. Thus, learning will act as the glue that holds the piecewise balanced growth paths of our model together. Our paper concerns a quantitative assessment of the reaction of key macroeconomic variables to permanent productivity growth shocks in this environment.

Of the many recent hypotheses for the 1970s inflation experience, the "misperceived change-in-trend" view has some of the more jarring policy implications. It suggests the possibility that even a determined and knowledgeable central bank—today's policymakers—could end up with a lot of inflation. The monetary authority is determined

[1] For recent empirical papers concerning trend breaks in productivity, see Bai et al. (1998) and the survey by Hansen (2001). Our reading of the empirical literature is that it is difficult to reconcile a completely trend-stationary view with the macroeconomic data.