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Drift and breaks in labor productivity

Luca Benati*

European Central Bank, Kaiserstrasse 29, D-60311, Frankfurt-am-Main, Germany

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Abstract

We use endogenous break tests, and the Stock–Watson TVP-MUB methodology, to investigate changes in the equilibrium rate of growth of labor productivity in the U.S., the Eurozone, the U.K., Australia, and Japan since WWII. Results for the U.S. well capture the 'conventional wisdom' of a golden era of high productivity growth, the 1950s and 1960s; a marked deceleration starting from the beginning of the 1970s; and a strong growth resurgence starting from mid-1990s. Results for the Eurozone point towards a deceleration since the early 1980s, with the equilibrium rate of growth of output per hour falling to 0.9% in 2004:4.

JEL classification: E30; E32

Keywords: Structural break tests; Time-varying parameters; Median-unbiased estimation; Bootstrapping; Monte Carlo integration

1. Introduction

Changes over time in equilibrium productivity growth are of interest to economists for several reasons. First, in the long run productivity is the key underlying determinant of a society's standards of living, and its possible future evolution plays therefore a crucial role in some of the most hotly debated current policy issues, like the future solvency of pension systems. As stressed by Robert

*Tel.: +49 69 1344 8849.
E-mail address: Luca.Benati@ecb.int.

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Gordon[1] within the context of the debate on the future of Social Security in the United States, for example,

> [t]here has been insufficient attention in public discussions of the Social Security 'crisis' that the official assumptions about future growth by the Social Security Administration are unbelievably pessimistic. [...] [T]hese assumptions are for growth over the next 75 years in real GDP of 1.4 percent, in the labor force of 0.3 percent, and in business productivity of 1.3 percent. [...] [T]he Social Security Administration has an alternative forecast of 2.14 percent growth in real GDP that puts off the 'day of reckoning' until 2072. Potential output growth of 2.9 percent would put off the day of reckoning until the year 2116 [...].

As Gordon makes clear, even seemingly mild differences in the assumptions concerning potential output growth have markedly different implications for the precise date in which U.S. Social Security will become insolvent. In particular, in the light of both a vast literature documenting the U.S. productivity acceleration since the second half of the 1990s, and the results reported in the present work – with trend productivity growth in both the U.S. nonfarm business and the business sectors estimated at 2.7% at the end of 2005 – assuming a trend rate of growth of productivity in the business sector of 1.3% appears indeed as unduly pessimistic.[2]

Second, mis-estimation of the true underlying equilibrium productivity growth rate may lead, in principle, to serious policy mistakes. In a series of influential papers,[3] Athanasios Orphanides has argued, for example, that part of the blame for the Great Inflation should be attributed to the FED's inability to detect, in real time, the productivity slowdown of the beginning of the 1970s, thus leading to an over-estimation of the authentic amount of slack existing in the economy.[4] A conceptually equivalent way of making the same point is that, as stressed by, e.g., Laubach and Williams (2003), changes in the rate of growth of potential output are closely linked to changes in the Wicksellian rate of interest,[5] so that failure to identify shifts in equilibrium productivity growth automatically leads to a mis-estimation of the natural rate of interest, with potentially dire consequences for monetary policy.[6]

[1] See Gordon (1999).

[2] This does *not* imply, however, that a 'conservative' estimate should be regarded as irrational or unjustified, when risk considerations are taken into account. As this paper shows, indeed, U.S. trend productivity growth has fluctuated quite substantially over the post-WWII era, so that, on strictly logical grounds, a future productivity slowdown should not be ruled out. In fact, as we discuss in Section 3.2.1 below, our results seem to suggest that the U.S. productivity resurgence of the second half of the 1990s might have reached a *plateau* around the very beginning of the new century.

[3] See e.g. Orphanides (2003).

[4] For an analysis of the consequences of learning about changes in trend productivity growth within the context of a DSGE model, see Edge et al. (2004).

[5] Conceptually in line with the present work, Laubach and Williams (2003) identify significant changes in the Wicksellian rate of interest in the United States over the post-WWII era.

[6] The recent work of Trehan and Wu (2006) contains however a qualification to Orphanides' position. As Trehan and Wu point out, to the extent that the equilibrium real rate '[...] moves in the same direction as the trend growth rate (as is suggested by theory), the probability that an unperceived change in trend growth will lead to a substantial change in inflation is noticeably lower than is suggested by recent analyses