Trends in "structural" productivity levels in the major industrialized countries

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Abstract

Estimating returns to hours worked and the employment rate provides us with an original interpretation of changes in US productivity and other industrialized countries' catch-up with US productivity levels over recent decades.
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1. Introduction

Hourly labor productivity levels in a number of European countries are thought to be very close to, or possibly even higher than, the levels "observed" in the United States (see Cette, 2005; Bourlès and Cette, 2006, for a survey). At the same time, however, there are large differentials between hours worked and/or employment rates in these countries and in the United States. Several empirical studies make mention of diminishing returns to hours worked and the employment rate.

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Estimating returns to hours worked and the employment rate allows us to (i) calculate "structural" hourly productivity for the United States, i.e., the productivity level assuming hours worked and the employment rate are constant, and to compare changes in this level with those in "observed" productivity; (ii) calculate "structural" hourly productivity levels for the other main industrialized countries, i.e., productivity levels assuming hours worked and the employment rate are the same as in the United States, expressed as a percentage of the US level, and to compare, for each country, the trends in this indicator with those in "observed" productivity.

Such a methodology leads to the following interpretation of changes in international productivity levels. Firstly, regarding the United States, it seems that the negative effects of the first oil shock on US hourly productivity was not as big as thought and that, contrarily to "observed" productivity, US "structural" productivity growth seems to decrease since 2000. Then, the computation of "structural" hourly productivity levels for the other main industrialized countries induce us to state that those countries' catch-up with US productivity levels is partially due to changes in hours worked and the employment rate.

2. The estimates

Bourlès and Cette (2006) propose an econometric estimate of decreasing returns on hours worked and the employment rate. The data used are mainly from the OECD. The specification adopted, which corresponds to the relationship presented further down, is similar to the one used by Gust and Marquez (2002, 2004) or Bélorgey et al. (2004). It concerns the entire economy of each country and is estimated on a panel of OECD countries for the 1992–2001 time period. It makes variations of the logarithm of hourly productivity dependent on an autoregressive term, variations of the logarithm of the employment rate, working time, absolute changes in the capacity utilization rate (to correct for cyclical effects), ICT (Information and Communication Technologies) production as a share of GDP and a constant term. Many other explanatory variables were alternatively introduced but their estimated coefficients either carried the opposite sign to the one expected or were not significantly different from zero. Moreover, those estimates were carried out using the instrumental variables method to correct for errors of measurement and simultaneity bias. Many ranges of instruments were tested for relevance; the one finally chosen was the one that gave the best results for the Nelson and Startz (1990a,b) test and the Sargan test (1958) on the overall quality of the adjustment and the overall relevance of the instruments, and the Durbin–Wu–Hausman test (Durbin, 1954; Wu, 1973; Hausman, 1978) on the exogeneity of the instruments. This range of instruments groups together the second difference of the explained variable, present and lagged variations of the log of output, the lagged variation in the employment rate and the investment rate. Lastly, our panel contains 14 OECD countries; this restriction is due either to data availability problems or to the relative stability of the results of estimates to the presence of each country. This panel corresponds to countries set out in Table 2 below.

Following the re-basing of European countries' national accounts (from base year 1995 to 2000), the OECD updated its assessments of hourly labor productivity for all of its members. This updating has resulted in some cases in sizeable modifications in relative levels of productivity. These changes have led us to re-estimate, using this new database, the relation explaining hourly productivity variations previously estimated in Bourlès and Cette (2006). The specification of the estimated equation and the conditions of this re-estimate are the same as in the previous study. The estimate was thus based on annual