

Abstract for “Sectoral Productivity Growth and Structural Change: An Application to EU-KLEMS”

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In this paper we consider the relative contribution of three main factors to aggregate labour productivity growth: sectoral total factor productivity (TFP), sectoral capital deepening and structural change. In order to disentangle the relative contribution of these factors, we adopt an econometric approach to estimate production frontiers for 20 manufacturing sectors in the major European countries and the US (data are obtained from the EU-KLEMS project; period 1977-2007; 13 countries). Estimates of the production frontiers are obtained using a panel data state-space model which allows flexible identification of country specific time trends (temporal variation in individual heterogeneity) and time variation in the vector of slope coefficients of the production frontiers (bias in technical change). The framework can be thought as an extension of the fixed effects model and is especially useful when dealing with EU-KLEMS data because of their “long” panel nature (i.e., small number of countries for a relative long time span).

The decomposition of labour productivity growth is obtained as follow. First, we apply the econometric model to the 20 sectors in order to obtain estimates of the coefficients of the production frontiers. Second, we use this estimates to produce a decomposition of sectoral labour productivity growth into capital deepening and TFP. Third, we disentangle the effect of the increase of labour productivity at sectoral level (arising from capital deepening and TFP) from the effect of the displacement of labour across sectors. In fact, if the labour share of high productivity sectors increase with respect to low productivity sectors, aggregate labour productivity will improve because of this mobility (even if labour productivity growth at sectoral level is kept constant). This effect is what we call structural change. Fourth, we consider an enhanced decomposition of aggregate labour productivity in which the aggregate effect of sectoral capital deepening and sectoral TFP growth are separated. Our final decomposition of aggregate labour productivity growth will entail therefore three components: the contribution of sectoral TFP growth, the effect of sectoral capital deepening, and the effect of structural change (labour mobility across sectors).

Our results suggest that the IT paradigm observed in the US economy (with strong labour productivity growth in IT sectors and migration of labour towards these sectors) has not spread into European countries. On the contrary, European countries have experienced very heterogeneous patterns of growth. In particular, our estimates pick-up two important phenomena: first the stable growth (mostly through investment in fixed capital) of Germany's manufacturing sectors; second the collapse of the industrial sector in the Italian economy, which led to a low aggregate growth rate in labour productivity.