Analysing Price Competitiveness in the European Single Market: A Decomposition of Inflation Differentials based on Leontief Input-Output Price models

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In this paper we introduce a price analysis approach based on Leontief input output price models and structural decomposition analysis (SDA). A comprehensive decomposition procedure enables us to reveal the drivers of producer price inflation. We apply the suggested model to analyse producer price inflation differentials of a representative sample of member states of the European Union against the background of the implementation of the Single Market Program in the second half of the 1990ies and the introduction of the single European currency beginning in 2002. The sample period extends from 2000 to 2014. The data basis consists of a time series of World Input Output tables enlarged by detailed Social Economic Accounts taken from the World Input Output Database and Eurostat.

Our approach allows not only to describe the development of inflation differentials in the sample of countries before (â€œpre-2008 periodâ€œ) and during the economic and financial crises (â€œpost-2008 periodâ€•) but to identify the contributions of the underlying drivers. While not immediately revealing causal relationships the SDA based approach produces a decomposition that is â€œtrueâ€• in the sense of an accounting relationship. Thus, we can evaluate to what extent the differences of sectoral producer price inflation vis-Ã -vis Germany is due to different developments of prices of imported intermediate inputs, productivity of imported intermediate inputs, prices of domestic intermediate inputs, productivity of domestic intermediate inputs, labour price, labour productivity, unit net operating surplus, unit consumption of fixed capital, and unit tax less subsidies. The development of prices of domestic intermediate inputs are explained by the various price and productivity (or cost) developments in the upstream sectors In this way our approach accounts for the indirect effects originating from the interdependences of sectors in an economy.

The main novelty of our approach is that it is based on the Leontief input-output model (Leontief, 1951) and uses a decomposition approach developped by Fujikawa et al. (1995) and Fujikawa and Milana (2002). Structural decomposition analysis has been often used to decompose economic growth (or growth in employment, trade, emissions, energy consumption) between two or more years into components attributed to factors such as productivity changes, structural changes and final demand changes. The application of this method to the decomposition of producer prices is seldom done but straightforward. Marrying decomposition analysis with input-output analysis allows to not only quantify the direct effects of changes in prices and productivity of factors of production but also their indirect effects conveyed via intermediate input effects.

Within the framework of the Leontief price model the prices and technical input needs (thus, the productivity) of primary factors, and the changes thereof, are taken as exogenous and the prices of gross output, and the changes thereof, are determined endogenously. Thus, this approach necessarily takes on a cost-push view at explaining of inflation. Nevertheless, based on the framework of national account data, this corresponds to revealing an accounting relationship. The main drivers of changes of producer prices are identified.