

DYNAMISING TRADE IN A DOMESTIC INPUT-OUTPUT MODEL – TINFORGE

Topic: International Trade

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Although Germany has a relatively moderate degree of openness (47%) compared to other European economies, its growth dependence on the trade channel is high: the growth impact of exports exceeds in general those of other GDP components and the export share of nominal GDP amounts to over 50%. Major industrial sectors like the car industry, the machinery and equipment industry or the chemical industry depend highly on foreign demand and, at the same time, are important employers and growth vehicles for the Germany economy. Although Germany is highly integrated in the European economy, the European crisis has shifted the export flow constantly towards other world regions. Especially China has turned into an important and vital trading partner. In such an environment, changing trade patterns and its impact on the domestic economy are important features for scientific-based policy analysis. World models that capture first and second round trade effects have been developed and applied. Nowadays, these models also include sophisticated country models that often incorporate input-output relations and price models. The advantages of these models are clear. Nevertheless, they demand time, data and work capacity. World trade in general is an exogenous given variable in national models such as INFORGE (Interindustry Forecasting Germany). In earlier versions, world trade was derived from the INFORUM model system (<http://www.inforum.umd.edu>), later, world trade was taken from the world model GINFORS. Currently, the trade module of INFORGE rests on third party projections that are integrated in a bilateral trade system. Each previous approach has proven to be less suitable for the purpose at hand: the INFORUM and GINFORS approach relied both on a complex world trade systems that lagged behind in their updating procedure. Current developments were not possible to integrate quickly. The current version, then again, does not encounter first and second round effects of world trade. The goal was to replace the import projection of third party institutions by a dynamic world trade model (TINFORGE) that could be easily updated and integrated into the national input-output model INFORGE.

TINFORGE connects 70 countries and regions by trade. Each country is price taker for imports and offers export goods on the world market. The bilateral trade matrix from the OECD determines the trade shares between all countries. The model solves its regression functions until 2030. Trade shares are estimated with a time trend, allowing changing trade shares in time. As a result, TINFORGE produces estimated growth paths for 70 countries and regions. They replace the previously used third party import projections that have been implemented in INFORGE. The trade module of INFORGE and its derivation of export demand by 63 economic activities remain unchanged.

In this paper, TINFORGE will be applied in order to test its advantages: a baseline scenario will be calculated that will be used as a reference to two further simulations: first a recession assumption in China will be implemented in TINFORGE. The effects of China's import demand will then be integrated in INFORGE as single effect. The second simulation uses the same assumption about China's growth path. But all effects of China's recession path will be integrated in INFORGE: the first and second round effects on other trading economies are additional inputs to INFORGE.

The results will show that the consideration of first and second round effects of world trade significantly alters the input factor for export simulations. Simulation 2 is likely to show greater negative effects on the German economy than simulation 1. The explicit consideration of first and second round effects of trade is significant.