

## Comparison of adaptation measures against climate change and uncertain supply chains

Topic: Inflation and Supply Chain Adaptation in Dynamic Interindustry Modelling

Author: Marc Ingo Wolter

Climate change (flooding in the south-west of Germany in 2021) and broken supply chains (war against Ukraine until 2022) have recently had significant consequences for economic development in Germany. Both impacts are examples for a growing number of uncertainties in future. To better cope with such uncertainties, economies should prepare to take countermeasures. Do countermeasures to both challenges – climate change and uncertain supply chains - have a similar effect on economic development? For policy makers in Germany, it is of interest, if both measures can be taken despite bottlenecks on the labour market at the same time. Therefore, the structural impacts on the labour market should be different.

A scenario analysis is applied to identify the effects on the economy of the countermeasure against climate change and uncertain supply chains. Therefore the INFORUM-Model INFORGE (INterindustry FORecasting Germany) of the Institute of Economic Structures Research (GWS [www.gws-os.com](http://www.gws-os.com), Germany Osnabrück) is used. In order to determine in particular the effects on the number of jobs required, the extended Q-INFORGE model is used for the scenario analysis. Q-INFORGE is developed together with the Institute for Employment Research in Nürnberg (IAB) and the Federal Institute for Vocational Education and Training in Bonn (BIBB). Q stands for the QuBe-project - qualifications and occupations in the future ([www.qube-projekt.de](http://www.qube-projekt.de)). The QuBe-project has been working together since 2007 and, among other things, produces the skilled labour monitoring for the Federal Ministry of Labour and Social Affairs in Germany since 2016. Q-INFORGE based on the system of national accounts and uses the IO-Tables to project eg. production, labour demand and professions. Each economic sector is modelled in detail. Final and intermediate demand, unit costs and prices have impact on the specific production and the employment of 63 economic sectors. The behavioural equations are econometrically estimated using data from 1991 to 2022. The model runs year by year from 2023 until 2050.

As countermeasure are analysed expenditures in climate adaptation on the one hand (impact eg. on agriculture and construction) and an enlargement of circular economy (impact eg. on material use and household spending) on the other hand. The results of both scenarios will be compared with the QuBe-Baseline-Projection. It is used the Baseline-Projection of the 7. Wave. The model Q-INFORGE is update every two years (last wave 2022). The QuBe-Baseline includes trends and behavioural equations that can be identified in the past and add such impacts that are known (legislation) or are inevitable (climate change).

The results of the scenarios will be compared with respect to value added, employment and structural change. Structural change is defined as the change of employment and production on the level of economic sectors. Furthermore, the impact of the scenarios on professions on the three-digit-level of the German classification of profession will be analysed. For this the results of each scenario are compared with the results of the baseline-projection and deviations are calculated. The deviations of both scenarios are compared.

It is expected that the results will show different consequences for economic development. The results will differ by economic sectors, by professions and in the temporal course. The results will show whether existing shortages in the labour market will increase or not. The analysis will give a new glance at the contribute of econometric IO-models to the risk management of policy makers.