From Global Conflict to Household Impact: The Czech Energy Crisis in the Wake of the Russian-Ukrainian War

Topic: Price and Income Policies
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In the wake of the Russian-Ukrainian conflict, profound changes are sweeping through the European energy landscape, significantly impacting economies dependent on energy commodity imports like the Czech Republic. In particular, the onset of the war was characterized by an unprecedented surge in natural gas, and more broadly, energy prices. Beyond the burden directly imposed on households by high energy prices, average prices of electricity and gas for industry more than doubled and tripled, respectively, by the end of 2022, compared to 2020 levels. As a consequence, energy inputs needed for the production of goods and services for householdsâ€™ final consumption may contribute to higher prices of household-expenditure items.

This paper aims to investigate the short-to-medium-term economic and distributional implications of this conflict on the Czech Republic, a small open economy that, like other European countries, has relied on oil and natural gas imports from Russia.

The study is structured in two primary segments. Initially, we extend the traditional input-output demand model by departing from the usual single representative household and integrate microdata from consumer expenditure surveys as described in [Cazcarro et al., 2022] to attribute the consumption of natural gas and other fuels in production processes to the final consumption of heterogeneous households defined by income deciles and yearly expenditures deciles, which may provide a better proxy for permanent income and has been suggested to be less sensitive to temporary situations. The inclusion of heterogeneous households in multisectoral models is pivotal for investigating the unequal burden experienced by households along the income distribution, particularly given their consumption patterns. Though the literature on the potential impacts of the Russian-Ukranian conflict on the energy system and the economy at different geopolitical scales is somewhat large, few studies have applied quantitative modeling techniques to investigate the heterogeneous effects of the conflict on households. Among the existing literature, a notable example is the paper by [Guan et al., 2023], which employs a global multi-regional input-output model database and household expenditure data to model the impacts of increased energy prices on heterogeneous households. Nevertheless, their modeling approach is unable to capture householdsâ€™ behavioral responses to the changing prices.

To gain insights into householdsâ€™ reactions to changing prices concerning their consumption decisions, in the subsequent phase, we link the ripple effects across various sectors of escalated energy prices estimated via an input-output price model to the static microsimulation optimization model DASMOD (Distributional And Social Impact Model), which allows for the estimation of social impacts of the rising energy prices according to income, income

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distribution, household expenditures, and potential fiscal effects [Å Ä•asnÃ½ and Bruha, 2008]. The microsimulation model is based on data from EU-SILC and HBS for the Czech Republic in 2019. Household behavioral responses are captured through price and income elasticities, with the model employing neutral cross-price elasticities. The use of our microsimulation model allows for a more refined exploration of the distributional and welfare effects of the energy crisis.

Ultimately, the study underscores the need for a holistic approach to addressing the challenges posed by energy dependency in the modern geopolitical landscape. The paper concludes by emphasizing the importance of resilience in energy policies, suggesting a need for diversification in energy sources and investment in sustainable energy alternatives to reduce

dependency on volatile energy imports, which according to the existing evidence, typically hurts poorer households more than richer ones, as, among other things, tend to generally spend a higher share of their income on energy products, and are thus more exposed to the direct effects of the energy crisis.

References

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