How should governments respond to energy shocks? A horse-race approach to compare the impacts of energy policies designed to counteract energy shocks.

Topic: Input-Output Modelling: Energy Policies - II
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Energy shocks are an important and topical issue in modern economies. By reducing production capacities, they can lead to increasing consumer prices and other consequences such as stagflation. In turn, energy shocks may reduce overall welfare. As the price of energy increases, the value of savings erodes and real wages decrease, these shocks may exacerbate inequality. This is since households, already struggling with energy poverty, may need to spend an even larger proportion of their incomes on increasingly expensive energy.

Although history suggests that energy shocks often trigger economic downturns, governments have devised tools to reduce their economic and societal costs. These tools have been used to tackle the current cost-of-living crisis across Europe and include: targeted energy price subsidies to low income household groups and untargeted energy price subsidies, energy bill support to firms as well as targeted and untargeted income subsidies to household.

Although extensive research exists investigating the impacts of various energy policies, few authors compare these fiscal policy measures on a like-for-like basis. It is however crucial to investigate the implications of these policies using a harmonized framework as it allows for clear comparisons of the outcomes of each policy. Hence, in this paper, I shed light on the strengths and benefits of a set of fiscal policy measures used by governments facing energy shocks. Motivated by the current fiscal policy measures implemented across Europe, I evaluate three sets of fiscal policies. These are: targeted and untargeted energy price subsidies to lower income households; firm energy price subsidies and general energy price subsidies to all agents and targeted and untargeted income subsidies to households.

To compare the fiscal policy measures, I develop a dynamic two-region Computable General Equilibrium model of Germany and the rest of the EU calibrated on Eurostatâ€™s Figaro data. Both Germany and the rest of the EU are endogenous regions whereas the rest of the world is assumed to be exogeous in the model. Households are dissagregated into net income quintiles using experimental data from Eurostat â€œicw_res_01â€•. Households are differentiated by their level of capital ownership, firm ownership, and sectoral consumption. Labour market dynamics are captured through a wage curve and non-energy sectors operate in perfectly competitive markets. Energy sectors have an oligopoly structure with profits being re-allocated disproportiantely to richer households. Production is captured through a multi-level structure where intermediate goods are aggregated through CES nests following the Armington assumption and combined with capital and labour to form final production. Other agents in the model are the rest of the world and the government sector.

I introduce a permanent exogenous foreign energy price shock and measure its aggregate, sectoral and distributional implications using the CGE model. Following this, I introduce the set of putative fiscal policies to counteract the shock and evaluate their effects. To compare the putative policies, I assume that governments are endowed with an additional debt financed budget in the first year. This debt must be reimbursed in the following periods. This budget is used for one of the policies allowing for a comparison of the key outcomes of each of the policies given the same initial budget. A windfall tax scenario is also introduced in which increases in energy firm profits are taxed to raise further government revenue in the period following the shock.

Following the introduction of the energy price shock, I find a long run reduction in real GDP with energy intensive sectors being impacted more negatively than other sectors. I also find increasing prices with energy prices puts upward pressure on non-energy prices as well as increasing inequality. The increasing inequality is a consequence of the larger household energy consumption share of lower income households. Inequality is further increased due to richer households holding more capital and collecting profits from the energy firms.

In general, the results of the paper suggest that fiscal policy makers face a trade-off between efficiency and equality for demand-side fiscal policy interventions. I find that targeted price subsidies and windfall tax funding are the most effective ways to reduce the inequality effects of the energy price shock. Firm price subsidies and General price subsidies are more effective at helping the economy rebound following the shock. Income subsidies are found to be much less effective than the other policies.

In the full paper, I will discuss the methodological decisions both modelling and policy implementation in more detail. I will also provide more discussion on the key results and interpretation of each of the policies.