Analysing Energy Sector Policy Proposals: Considerations for Economic Modellers and Policymakers

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Abstract

A number of major energy sector policy questions and proposals are being discussed at the national level. These include the price of electricity set by the regulator, the choice of electricity generation-mix and the implementation of a carbon tax. Economic modellers tasked with analysing the economy-wide effects of such proposals typically measure the impact of changes relative to a business-as-usual baseline scenario in which the exogenous change or scenario under investigation is excluded. However, what if the business-as-usual case is not sustainable without the policy change in question or may trigger other events in the economy? This paper investigates some of the considerations modellers, policymakers and observers must take into account when evaluating some of the most prominent energy policy questions today.

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Keywords: Computable general equilibrium, energy policy

CGE modeling is a challenging field. It requires mastery of economic theory, meticulous preparation of data and familiarity with underlying accounting conventions, knowledge of econometric methods, and an understanding of solution algorithms and associated software for solving large equation systems. However, the most important requirement is the ability to communicate. CGE modeling is primarily about shedding light on real-world policy issues. For CGE analyses to be influential, modelers must explain their results in a way that is comprehensible and convincing to their fellow economists, and eventually to policy makers.

While CGE modeling is challenging, it is also rewarding. CGE models are used in almost every part of the world to generate insights into the effects of policies and other shocks in the areas of trade, taxation, public expenditure, social security, demography, immigration, technology, labor markets, environment, resources, infrastructure and major-project expenditures, disasters, and financial crises. CGE modeling is the only practical way of quantifying these effects on industries, occupations, regions and socioeconomic groups.

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From the Handbook of CGE Modeling

Introduction

Dynamic CGE models have become an increasingly popular tool for policymakers in South Africa to analyse the effects of proposed policy changes on an economy-wide basis. However, like any other, this methodology is not without its challenges. This discussion focusses on the role and importance of forecasting in conducting policy analysis. If we wish to understand the impact of a proposed policy change on a particular variable, or even the economy as a whole, over a given period of time, we must first endeavour to understand how the economy will look should the policy in question not be implemented. This necessarily forces us into the realm of forecasting – considered a fool's errand by many economists. Nonetheless, producing a business-as-usual baseline picture of the economy against which to measure the impact of any policy change is our first order of business when conducting dynamic CGE modelling simulations.

For CGE models, such as UPGEM, that are solved using GEMPACK, policy simulation results for its numerous variables are typically reported as percentage change deviations from the baseline. In our experience, these percentage deviations are not very sensitive to minor variations in the baseline forecast. However, under conditions where large policy shocks are simulated (e.g. electricity generation-mix changes), the underlying levels value of a variable is of practical importance (e.g. carbon emissions levels), or the non-implementation of a policy change may lead to knock-on effects in the economy's baseline path not endogenous to the model (e.g. persisting with below cost-reflective electricity pricing causing increased government debt that may lead to a credit ratings downgrade), baseline forecast assumptions take on considerably more significance when interpreting policy results.

In this conference paper we discuss a number of important examples from the energy sector in which modellers have faced difficulties in conducting sound policy analysis due to uncertainty regarding the baseline scenario. Consequently, this has caused great difficulty to policymakers attempting to judge the merits of a proposal, often in the face of pressure from lobby groups on both sides of the isle. We suggest ways in which to construct suitable baseline projections and interpret the results from policy simulations in a manner that would eliminate many of these problems and allow the real message of the simulation results to be heard.

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