Impact of the Political and Economic Restructuring in Eastern Europe on the Availability of Net Energy Exports – An Empirical Framework

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Abstract

The recent political changes will not only affect the domestic economies of the Eastern European countries but also important world commodity markets. This paper investigates the consequences for world energy markets. For this purpose, a disaggregated model of the Eastern European energy markets is developed that accounts for the introduction markets ('pricing') into the formerly central planned economies. Deregulation will stimulate conservation and will favour 'noble' fuels, i.e. oil, gas and electricity. (Potential) net energy exports will slightly increase by 1995 where gas exports could compensate for the decline in oil exports.

1. Introduction

The dramatic political, economic and social changes in Eastern Europe during 1989 pose many questions. This paper asks 'What are the consequences of these changes on global energy markets?' Or, put differently, 'Will these changes aggravate or relax the international energy demand/supply balance?' The recent developments in the Middle East increase the importance of the USSR's energy exports.

This task seems modest compared with the dramatic economic and social revolution that occurred during the last year. However, even the above question has to be narrowed because of its far-reaching consequences in an increasingly interrelated world. Therefore, we rephrase the question to: 'What excess supply of Eastern Europe and the USSR will be available on future world energy markets, considering the presumably irreversible changes in the economic and political conditions?' The major reason for this restriction is that these changes within the former Eastern bloc will have a substantial impact on Western countries and this effect may counteract or aggravate the tendencies from the deregulation in Eastern Europe.†

In order to address this question we propose a (fairly standard)
framework to model quantitatively the developing energy markets in Eastern Europe. This framework emphasizes the adjustments on the demand side, while supply is by and large unresponsive to political conditions. Sections 2 to 4 introduce the model. Section 5 outlines two scenarios. Section 6 discusses the results and Section 7 concludes with the implications on international energy markets. An elaborate empirical research was necessary to assess the parameters, since econometric techniques applied to massaged figures of command economies cannot reveal the expected markets' responses. An Appendix compares energy efficiencies and surveys published energy demand elasticities.

2. The model–overview

The model of the Eastern European energy markets is based on published energy balances for the seven major members of the Council for Mutual Economic Assistance (CMEA): Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania and the Soviet Union; the other three full members (Mongolian's People's Republic, Cuba and Vietnam) are not studied. Furthermore, the study considers the geographical area of these states prior to the radical changes, and in particular the unification of Germany.

An investigation of the future energy demand of the CMEA may restrict itself to generalities, at best supported by simple aggregate extrapolations. One may excuse this simplicity by the general lack of data or its unreliability and the difficulty of comparing them with the indicators of a market economy. This easy route is not pursued in the following. On the contrary, we start from a detailed sectoral breakdown of twenty-seven flows and eight products for seven countries, see Table 1. However, the breakdown of a particular country is not necessarily at this level of disaggregation if the corresponding data are missing.

This detailed breakdown facilitates the study of sectoral shifts that most likely will occur, because Eastern European economies rely disproportionally on industry and in particular on energy intensive, basic industry. Furthermore, this level of disaggregation allows us to incorporate constraints, e.g. those that arise for politico-economical reasons.

The bottom-up procedure starts with the aggregate energy consumption of an element of total final consumption, e.g. total energy input into the iron and steel industry. From this aggregate demand we subtract the purchases of district heat and the remainder is split among solid, liquid, gaseous and electric fuels. These sectoral demands add up to total final consumption (by products) that has to be supplied by the transformation sector, power plants and refineries. Adding these 'losses' during transformation one then arrives at the total primary energy requirements of a country. Balancing these primary requirements (including marine bun-